1985 - CID510160_TazewellCounty_CFPF-3

Application Details

Funding Opportunity:	1448-Virginia Community Flood Preparedness Fund - Study Grants - CY23 Round 4
Program Area:	Virginia Community Flood Preparedness Fund
Application Status:	Under Review
Stage:	Final Application
Organization:	Tazewell County
Applicant:	Rebekah Cazares
Internal Status:	
Initial Submit Date:	Nov 11, 2023 7:44 PM
Initially Submitted By:	Rebekah Cazares
Last Submit Date:	
Last Submitted By:	

Stacey Farinholt

Review Details

Round:	1
Reviewer:	Stacey Farinholt
Type:	Internal
Role:	Primary
Review Status:	Submitted
Submitted Date:	Nov 21, 2023 1:13 PM
Score:	**0.00**

Studies Grant Scoring - Round 4

Eligibility and Scoring

Eligibility

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

Yes = Eligible for consideration
No = Not eligible for consideration

Local Government*: Yes

Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?

Yes = Eligible for consideration under all categories
No = Eligible for consideration for studies, capacity building, and planning only

Resilience Plan*: Yes

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

Yes = Eligible for consideration
No = Not eligible for consideration

Letters of Support*: Yes

Has this or any portion of this project been included in any application or program previously funded by the Department?

Yes = Not eligible for consideration
No = Eligible for consideration

Previously Funded*: No

Has the applicant provided evidence of an ability to provide the required matching funds?

Yes = Eligible for consideration
No = Not eligible for consideration
N/A = Match not required

Required Matching Funds*: Yes

Project Eligible for Consideration*: No

Eligibility Comments:

Budget narrative does not conform to grant manual requirements. Page 31 of grant manual states "Estimates for all work to be completed by third parties (engineers, contractors, etc.) on the specified project should be included," but no cost estimates/ proposals are included.
Page 31 of grant manual states "Include a detailed breakdown of how this funding is proposed to be allocated. At a minimum this should include a breakdown of salaries,....travel, equipment, supplies...and any other direct cost." No such breakdown is included.
Match is in-kind (staff). Amounts are broken down by phase of study but not by salary/benefits, etc.
This application would be approved otherwise.

Scoring - Eligible Studies (Select all that apply)

Revising floodplain ordinances to maintain compliance with the NFIP or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks or freeboard, or correcting issues identified in a Corrective Action Plan.

(If Yes - 30 Points | If No - 0 Points)

Revising Floodplain Ordinances*: No

Creating tools or applications to identify, aggregate, or display information on flood risk or creating a crowd-sourced mapping platform that gathers data points about real-time flooding. This could include a locally or regionally based web-based mapping product that allows local residents to better understand their flood risk.

(If Yes - 25 Points | If No - 0 Points)

Mapping Platform*: No

Conducting hydrologic and hydraulic studies of floodplains. Applicants who create new maps must apply for a Letter of Map Revision or a Physical Map Revision through the Federal Emergency Management Agency (FEMA).

(If Yes - 15 Points | If No - 0 Points)

Hydrologic and Hydraulic Studies*: Yes

Studies and Data Collection of Statewide and Regional Significance. Funding of studies of statewide and regional significance and proposals will be considered for the following types of studies:

Updating precipitation data and IDF information (rain intensity, duration, frequency estimates) including such data at a sub-state or regional scale on a periodic basis.

(If Yes - 45 | If No - 0)

Updating Precipitation Data and IDF Information*: No

Regional relative sea level rise projections for use in determining future impacts.

(If Yes - 45 Points | If No - 0 Points)

Projections*: No

Vulnerability analysis either statewide or regionally to state transportation, water supply, water treatment, impounding structures, or other significant and vital infrastructure from flooding.

(If Yes - 45 Points | If No - 0 Points)

Vulnerability Analysis*: No

Flash flood studies and modeling in riverine regions of the state.

(If Yes - 45 Points | If No - 0 Points)

Flash Flood Studies*: No

Statewide or regional stream gauge monitoring to include expansion of existing gauge networks.

(If Yes - 45 Points | If No - 0 Points)

Stream Gauge Monitoring*: No

New or updated delineations of areas of recurrent flooding, stormwater flooding, and storm surge vulnerability in coastal areas that include projections for future conditions based on sea level rise, more intense rainfall events, or other relevant flood risk factors.

(If Yes - 45 Points | If No - 0 Points)

Delineations of Areas of Recurrent Flooding*: No

Regional flood studies in riverine communities that may include watershed-scale evaluation, updated estimates of rainfall intensity, or other information.

(If Yes - 50 Points | If No - 0 Points)

Regional Flood Studies*: No

Regional Hydrologic and Hydraulic Studies of Floodplains

(If Yes - 45 Points | If No - 0 Points)

Regional Hydrologic and Hydraulic Studies of Floodplains*: No

Studies of potential land use strategies that could be implemented by a local government to reduce or mitigate damage from coastal or riverine flooding.

(If Yes - 40 Points | If No - 0 Points)

Potential Land Use Strategies*: No

Other proposals that will significantly improve protection from flooding on a statewide or regional basis.

(If Yes - 35 Points | If No - 0 Points)

Other Proposals*: No

Is the project area socially vulnerable? (based on ADAPT Virginia?s Social Vulnerability Index Score)

Social Vulnerability Scoring:

Very High Social Vulnerability (More than 1.5) - 10 Points

High Social Vulnerability (1.0 to 1.5) - 8 Points

Moderate Social Vulnerability (0.0 to 1.0) - 5 Points

Low Social Vulnerability (-1.0 to 0.0) - 0 Points

Very Low Social Vulnerability (Less than -1.0) - 0 Points

Socially Vulnerable Scoring*: Moderate Social Vulnerability (0.0 to 1.0)

Is the proposed project part of an effort to join or remedy the community?s probation or suspension from the NFIP?

(If Yes - 5 Points | If No - 0 Points)

NFIP*: No

Is the proposed project in a low-income geographic area as defined below?

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

(If Yes - 10 Points | If No - 0 Points)

Low-Income Geographic Area*: Yes

Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs.

Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?

(If Yes - 5 Points | If No - 0 Points)

Reduction of Nutrient and Sediment Pollution*: No

Scoring Comments:

Score:30

Project Total Score*: 0

Special Conditions:

Chapter 8 FLOOD DAMAGE PREVENTION[1]

TITLE

TAZEWELL COUNTY FLOOD DAMAGE PREVENTION ORDINANCE, IN ACCORDANCE WITH SECTION 15.1-431 OF THE CODE OF VIRGINIA, (1950), AS AMENDED. ;FL;

ARTICLE I. GENERAL PROVISIONS

Sec. 8-1. Statutory authorization and purpose.

This chapter is adopted pursuant to the authority granted by Code of Virginia § 15.2-2280. The purpose of these provisions is to prevent: The loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

(1) Regulating uses, activities, and development which, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;

(2) Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;

(3) Requiring all those uses, activities, and developments that do occur in floodprone districts to be protected and/or floodproofed against flooding and flood damage; and,

(4) Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards.

(Ord. of 1-11-11(1), § 1.1)

Sec. 8-2. Applicability.

These provisions shall apply to all privately and publicly-owned lands within jurisdiction of the unincorporated portions of Tazewell County, Virginia, and identified as being floodprone.

(Ord. of 1-11-11(1), § 1.2)

---

[1]Editor's note(s)—Ord. adopted Jan. 11, 2011, repealed the former Ch. 8, Arts. I—IV, §§ 8-1—8-9, 8-36, 8-37, 8-61—8-64, 8-86—8-90, and enacted a new Ch. 8 as set out herein. The former Ch. 8 pertained to similar subject matter and derived from an ordinance adopted Sept. 10, 1990.

Cross reference(s)—Erosion and sediment control, Ch. 6; fire prevention and protection, Ch. 7; housing, Ch. 9; mobile homes, Ch. 11; planning and development, Ch. 15; sewers and drains, Ch. 16; subdivisions, App. A; flood provisions under subdivision ordinance, App. A, § 4-3.

State law reference(s)—Flood Damage Reduction Act, Code of Virginia, § 10.1-600 et seq.; comprehensive flood control program, Code of Virginia, §§ 10.1-658, 10.1-659.

Sec. 8-3. Compliance and liability.

(a) No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this chapter and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this chapter.

(b) The degree of flood protection sought by the provisions of this chapter is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. This chapter does not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.

(c) Records of actions associated with administering this chapter shall be kept on file and maintained by the Department of Building Safety or such other custodian as may from time to time be selected by the Board of Supervisors by resolution.

(d) This chapter shall not create liability on the part of Tazewell County or any officer or employee thereof for any flood damages that result from reliance on this chapter or any administrative decision lawfully made there under.

(Ord. of 1-11-11(1), § 1.3)

Sec. 8-4. Abrogation and greater restrictions.

This chapter supersedes any ordinance currently in effect in floodprone areas. Any ordinance, however, shall remain in full force and effect to the extent that its provisions are more restrictive.

(Ord. of 1-11-11(1), § 1.4)

Sec. 8-5. Severability.

If any section, subsection, paragraph, sentence, clause, or phrase of this chapter shall be declared invalid for any reason whatever, such decision shall not affect the remaining portions of this chapter. The remaining portions shall remain in full force and effect; and for this purpose, the provisions of this chapter are hereby declared to be severable.

(Ord. of 1-11-11(1), § 1.5)

Sec. 8-6. Penalty for violations.

Any person who fails to comply with any of the requirements or provisions of this article or directions of the director of planning or any authorized employee of Tazewell County shall be guilty of a misdemeanor and subject to the penalties there for.

In addition to the above penalties, all other actions are hereby reserved, including an action in equity for the proper enforcement of this article. The imposition of a fine or penalty for any violation of, or noncompliance with, this article shall not excuse the violation or noncompliance or permit it to continue; and all such persons shall be required to correct or remedy such violations or noncompliance within a reasonable time. Any structure constructed, reconstructed, enlarged, altered or relocated in noncompliance with this article may be condemned, declared to be a public nuisance, and be abatable as such. Flood insurance may be withheld from structures constructed in violation of this article.

(Ord. of 1-11-11(1), § 1.6)

Secs. 8-7—8-15. Reserved.

ARTICLE II. DEFINITIONS

Sec. 8-16. Definitions.

[The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:]

Base flood. The flood having a one-percent chance of being equaled or exceeded in any given year.

Base flood elevation. The Federal Emergency Management Agency designated 100-year water surface elevation. The water surface elevation of the base flood in relation to the datum specified on the community's flood insurance rate map. For the purposes of this chapter, the 100-year flood or one-percent annual chance flood.

Basement. Any area of the building having its floor sub-grade (below ground level) on all sides.

Board of appeals. The board designated by separate ordinance to review appeals made by individuals with regard to decisions of the ordinance administrator in the interpretation of this chapter until such time as an appeals board is so designated, all appeals shall be presented to the board of supervisors.

Development. Any manmade change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

Elevated building. A nonbasement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, or columns (posts and piers).

Encroachment. The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Flood or *flooding:*

(1) A general or temporary condition of partial or complete inundation of normally dry land areas from:

    a. The overflow of inland or tidal waters; or

    b. The unusual and rapid accumulation or runoff of surface waters from any source.

    c. Mudflows which are proximately caused by flooding as defined in paragraph (1)b. of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

(2) The collapse or subsistence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (1)a. of this definition.

Flood insurance rate map (FIRM). An official map of a community, on which the administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has made available digitally is called a digital flood insurance rate map (DFIRM).

Flood insurance study (FIS). An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudflow and/or flood-related erosion hazards.

Floodplain or *floodprone area.* Any land area susceptible to being inundated by water from any source.

Floodproofing. Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot.

Freeboard. A factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed. When a freeboard is included in the height of a structure, the flood insurance premiums may be cheaper.

Highest adjacent grade. The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure. Any structure that is:

(1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

(2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or

(4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

  a. By an approved state program as determined by the Secretary of the Interior; or

  b. Directly by the Secretary of the Interior in states without approved programs.

Lowest floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of Federal Code 44CFR § 60.3.

Manufactured home. A structure, transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than one hundred eighty (180) consecutive days, but does not include a recreational vehicle.

Manufactured home park or subdivision. A parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

New construction. For the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after the enactment of this chapter, or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

Recreational vehicle. A vehicle which is:

(1) Built on a single chassis;

(2) Four hundred (400) square feet or less when measured at the largest horizontal projection;

(3) Designed to be self-propelled or permanently towable by a light duty truck; and

(4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

Special flood hazard area. The land in the floodplain subject to a one-percent or greater chance of being flooded in any given year as determined in section 8-32 of this chapter.

Start of construction. For other than new construction and substantial improvement, under the Coastal Barriers Resource Act (P.L. - 97-348), means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Structure. For floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Substantial damage. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

Substantial improvement. Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds fifty (50) percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage regardless of the actual repair work performed. The term does not, however, include either:

(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

(2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.

Violation. The failure of a structure or other development to be fully compliant with the county's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in sections 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) is presumed to be in violation until such time as that documentation is provided.

Watercourse. A lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

Zoning administrator or *ordinance administrator* or *administrator.* The public official designated by the Tazewell County Board of Supervisors, by separate ordinance or resolution, to administer, interpret and enforce the ordinance for the county.

(Ord. of 1-11-11(1))

Secs. 8-17—8-30. Reserved.

ARTICLE III.ESTABLISHMENT OF DISTRICTS

Sec. 8-31. Description of districts.

(a) *Basis of districts.* The various floodplain districts shall include special flood hazard areas. The basis for the delineation of these districts shall be the flood insurance study (FIS) and the flood insurance rate maps (FIRM) for Tazewell County prepared by the Federal Emergency Management Agency, Federal Insurance Administration, and Tazewell County, dated February 18, 2011, and any subsequent revisions or amendments thereto.

The boundaries of the special flood hazard area and floodplain districts are established as shown on the flood insurance rate map which is declared to be a part of this chapter and which shall be kept on file at the Tazewell County Building Safety office.

(1) The floodway district is delineated, for purposes of this chapter, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the 100-year flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this District are specifically defined in the above-referenced flood insurance study and shown on the accompanying flood insurance rate map.

(2) The special floodplain district shall be those areas identified as an AE zone on the maps accompanying the flood Insurance Study for which 100-year flood elevations have been provided.

(3) The approximated floodplain district shall be those areas identified as an A or A99 zone on the maps accompanying the flood insurance study. In these zones, no detailed flood profiles or elevations are provided, but the 100-year floodplain boundary has been approximated. For these areas, the 100-year flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific 100-year flood elevation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Flood Plain Information Reports, U.S. Geological Survey Flood-Prone Quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this elevation in accordance with hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the governing body.

(b) *Overlay concept.*

(1) The floodplain districts described above shall be overlays to districts as shown on any future official zoning ordinance map, and as such, the provisions for the floodplain districts shall serve as a supplement to the underlying district provisions.

(2) If there is any conflict between the provisions or requirements of the floodplain districts and those of any underlying district, the more restrictive provisions and/or those pertaining to the floodplain districts shall apply.

(3) In the event any provision concerning a floodplain district is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

(Ord. of 1-11-11(1), § 3.1)

Sec. 8-32. District boundary changes.

The delineation of any of the floodplain districts may be revised by the Tazewell County Board of Supervisors where natural or manmade changes have occurred and/or where more detailed studies have been conducted or undertaken by the U. S. Army Corps of Engineers or other qualified agency, or an individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Insurance Administration.

(Ord. of 1-11-11(1), § 3.3)

Sec. 8-33. Interpretation of district boundaries.

Initial interpretations of the boundaries of the floodplain districts shall be made by the floodplain ordinance administrator (hereinafter referred to as the ordinance administrator or administrator). Should a dispute arise concerning the boundaries of any of the districts, the board of zoning appeals, or if there being none, the board of supervisors shall make the necessary determination. The person questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present his case to the board and to submit his own technical evidence if he so desires.

(Ord. of 1-11-11(1), § 3.4)

Sec. 8-34. Submitting technical data.

A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six (6) months after the date such information becomes available, a community shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

(Ord. of 1-11-11(1), § 3.5)

Secs. 8-35—8-50. Reserved.

ARTICLE IV. DISTRICT PROVISIONS

Sec. 8-51. Permit and application requirements.

(a) *Permit requirement.* All uses, activities, and development occurring within any floodplain district, including placement of manufactured homes, shall be undertaken only upon the issuance of a floodplain building permit. Such development shall be undertaken only in strict compliance with the provisions of this chapter and with all other applicable codes and ordinances, as amended, such as the Virginia Uniform Statewide Building Code (VA USBC) and the Tazewell County Subdivision Ordinance. Prior to the issuance of any such permit, the administrator shall require all applications to include compliance with all applicable state and federal laws and shall review all sites to assure they are reasonably safe from flooding. Under no circumstances shall any use, activity, and/or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.

(b) *Site plans and permit applications.* All applications for development within any floodplain district and all building permits issued for the floodplain shall incorporate the following information:

(1) The elevation of the base flood at the site.

(2) The elevation of the lowest floor (including basement).

(3) For structures to be floodproofed (nonresidential only), the elevation to which the structure will be floodproofed.

(4) Topographic information showing existing and proposed ground elevations.

(Ord. of 1-11-11(1), § 4.1)

Sec. 8-52. General standards.

The following provisions shall apply to all permits:

(1) New construction and substantial improvements shall be according to the VA USBC, and anchored to prevent flotation, collapse or lateral movement of the structure.

(2) Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state anchoring requirements for resisting wind forces.

(3) New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(4) New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.

(5) Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(6) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.

(7) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.

(8) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.

In addition to provisions (1)—(8) above, in all special flood hazard areas, the additional provisions shall apply:

(9) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction a permit shall be obtained from the U. S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resources Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and the Federal Insurance Administrator.

(10) The flood-carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

(Ord. of 1-11-11(1), § 4.2)

Sec. 8-53. Specific standards.

In all special flood hazard areas where base flood elevations have been provided in the flood insurance study or generated according section 8-56, the following provisions shall apply:

(1) *Residential construction.* New construction or substantial improvement of any residential structure, including manufactured homes, shall have the lowest floor, including basement, elevated to or above the base flood level of at least one (1) foot above the base flood level.

(2) *Nonresidential construction.* New construction or substantial improvement of any commercial, industrial, or nonresidential building or manufactured home shall have the lowest floor, including basement, elevated to or above the base flood level of at least one (1) foot above the base flood level. Buildings located in all A1—30, AE, and AH zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the BFE plus one (1) foot are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation to which such structures are floodproofed, shall be maintained by the ordinance administrator.

(3) *Elevated buildings.* Fully enclosed areas, of new construction or substantially improved structures, which are below the regulatory flood protection elevation shall:

a. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).

b. Be constructed entirely of flood-resistant materials below the regulatory flood protection elevation;

c. Include, in zones A, AO, AE, and A1—30, measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet the following minimum design criteria:

1. Provide a minimum of two (2) openings on different sides of each enclosed area subject to flooding.

2. The total net area of all openings must be at least one (1) square inch for each square foot of enclosed area subject to flooding.

3. If a building has more than one (1) enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.

4. The bottom of all required openings shall be no higher than one (1) foot above the adjacent grade.

5. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.

6. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

(4) *Standards for manufactured homes and recreational vehicles.*

a. All manufactured homes placed, or substantially improved, on individual lots or parcels, in expansions to existing manufactured home parks or subdivisions, in a new manufactured home park or subdivision or in an existing manufactured home park or subdivision on which a manufactured home has incurred substantial damage as the result of a flood, must meet all the requirements for new construction, including the elevation and anchoring requirements in subsection 8-52(1) and (2), and subsection 8-53(1).

b. All recreational vehicles placed on sites must either:

1. Be on the site for fewer than one hundred eighty (180) consecutive days;

2. Be fully licensed and ready for highway use: A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions; or

3. Meet all the requirements for manufactured homes in sections 8-52 and 8-53(4).

(Ord. of 1-11-11(1), § 4.3)

Sec. 8-54. Standards for the floodway district.

The following provisions shall apply within the floodway district:

(1) Encroachments, including fill, new construction, substantial improvements and other developments are prohibited unless certification such as hydrologic and hydraulic analyses (with supporting technical data) is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the base flood. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the ordinance administrator.

Development activities which increase the water surface elevation of the base flood may be allowed, provided that the applicant first applies, with the ordinance administrator's endorsement, for a conditional flood insurance rate map and floodway revision, and receives the approval of the Federal Emergency Management Agency.

(2) If section 8-56 is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of article IV.

(3) The placement of manufactured homes (mobile homes) is prohibited, except in an existing manufactured homes (mobile homes) park or subdivision. A replacement manufactured home may be placed on a lot in an existing manufactured home park or subdivision provided the anchoring, elevation, and encroachment standards are met.

(Ord. of 1-11-11(1), § 4.4)

Sec. 8-55. Standards for the special floodplain district.

The following provisions shall apply within the special floodplain district:

Until a regulatory floodway is designated, no new construction, substantial improvements, or other development, including fill, shall be permitted within the areas of special flood hazard, designated as zones A1—30 and AE on the flood insurance rate map, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point on property not owned by the applicant.

Development activities in zones Al—30, AE, and AH, on the county's flood insurance rate map which increase the water surface elevation of the base flood by more than one (1) foot may be allowed, provided that the applicant first applies, with the ordinance administrator's endorsement, for a conditional flood insurance rate map revision, and receives the approval of the Federal Emergency Management Agency.

(Ord. of 1-11-11(1), § 4.5)

Sec. 8-56. Standards for approximated floodplain.

The following provisions shall apply with the approximate floodplain district:

The approximated floodplain district shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a 100-year floodplain boundary has been approximated. Such areas are shown as zone A on the maps accompanying the flood insurance study. For these areas, the 100-year flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific 100-year flood elevation cannot be determined for this area using other sources of data, such as the U. S. Army Corps of Engineers Floodplain Information Reports, U. S. Geological Survey Flood-Prone Quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this elevation. For development proposed in the approximate floodplain the applicant must use technical methods that correctly reflect currently accepted technical concepts, such as point on boundary, high water marks, or hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the ordinance administrator.

The ordinance administrator reserves the right to require hydrologic and hydraulic analyses for any development.

When such base flood elevation data is utilized, the lowest floor shall be elevated to or above the base flood level. During the permitting process, the Ordinance Administrator shall obtain:

(1) The elevation of the lowest floor (including the basement) of all new and substantially improved structures; and

(2) If the structure has been floodproofed in accordance with the requirements of this article, the elevation (in relation to mean sea level) to which the structure has been floodproofed.

(Ord. of 1-11-11(1), § 4.6)

Sec. 8-57. Standards for subdivision proposals.

(a) All subdivision proposals shall be consistent with the need to minimize flood damage;

(b) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;

(c) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards; and

(d) Base flood elevation data shall be provided for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed fifty (50) lots or five (5) acres, whichever is the lesser.

(Ord. of 1-11-11(1), § 4.7)

Secs. 8-58—8-70. Reserved.

ARTICLE V. PERMIT PROCESS

Sec. 8-71. Ordinance administrator review required.

No development or construction may be built in a flood district without a permit issued by the ordinance administrator or a certificate from the ordinance administrator that such development or construction does not come within the jurisdiction of this chapter. persons proposing development or construction in flood districts shall apply for a determination of applicability or a permit from the ordinance administrator.

(Ord. of 1-11-11(1), § 5.1)

Sec. 8-72. Development or construction permitting.

Applications for permits shall be submitted to the building official's office who shall forward the same to the ordinance administrator. The ordinance administrator shall establish a form for applications. The board of supervisors may by resolution establish a reasonable fee for processing applications.

(1) Permit approval. The ordinance administrator shall, within ten (10) days of submission of an application, (1) determine whether the proposed Development or Construction is within the jurisdiction of this chapter and (2) whether the proposed development or construction would be permitted by this chapter. The ten-day time limit for approval shall be tolled for any application that is incomplete, while such application is incomplete, or for any application where any particular request for additional information is outstanding, until such information is supplied by the applicant.

a. If development or construction as proposed is not within the jurisdiction of this chapter the ordinance administrator shall provide a certificate to the applicant advising that the structure is not within the jurisdiction of this chapter and advising the building inspector that such construction is not regulated by the ordinance.

b. If the proposed development or construction is within the jurisdiction of this chapter, the ordinance administrator shall, notify the applicant in writing and advise him that the application is either approved or that it is not approved. If the application is denied the notice shall state the reasons for the denial.

(2) Any notice given pursuant to this section shall advise the applicant of their right to request a variance from ordinance requirements or to appeal any decision of the ordinance administrator to the board of supervisors or zoning board and shall include the date, location and approximate time by which the application for variance or for an appeal must be submitted to the county administrator. Such notice to the applicant shall be in writing sent by certified mail to the address shown on the application. Failure to provide the applicant notice or any defect in notice shall be remedied by tolling the time in which the applicant may request a variance or an appeal until proper notice is given. If no notice is sent to the applicant within thirty (30) days of the date of the application, the applicant may consider the application denied and proceed with an appeal, should the applicant chose to do so.

(3) The applicant shall have thirty (30) days from the date of the notice of denial to file a written request for an appeal or a variance with the county administrator. Failure to note the appeal within thirty (30) days shall forever bar the request for appeal or variance.

(Ord. of 1-11-11(1), § 5.2)

Sec. 8-73. Appeal and variance process.

(a) Upon receipt of a notice of appeal or variance from a decision of the ordinance administrator, the county administrator shall schedule a hearing before the board of supervisors or zoning board. Where the applicant requests a variance the administrator shall cause a notice of the application for variance to be mailed to all owners of property adjoining the property upon which applicant proposes development or construction not in conformity with the ordinance. Such notice shall be sufficient if mailed by first class U.S. mail to the address of the owner as shown in the commissioner of revenue or treasurer's office. The board of supervisors by resolution may establish a fee for the costs of issuing such notice to be paid by applicants for variances. Such fee shall be established annually.

(b) The board of supervisors or zoning board shall hear the appeal or request for variance within a reasonable time. Should the Board not hear the appeal within six (6) months, the applicant may consider the appeal denied. A conditional variance granted to the applicant may be deemed a denial by the applicant. Notice of the board's decision shall be given to the applicant in the same manner as notice of denial was given to the applicant by the ordinance administrator.

(c) The applicant may appeal the board's decision to the Circuit Court for the County of Tazewell, Virginia by filing a petition with said court within ninety (90) days of the date of the notice of the board's decision.

(Ord. of 1-11-11(1), § 5.3)

Secs. 8-74—8-90. Reserved.

ARTICLE VI. APPEALS AND VARIANCES

Sec. 8-91. Appeals.

Appeals are a claim that the decision of the ordinance administrator was in error. If an appeal is granted by the zoning board the ordinance administrator may appeal the decision of the zoning board to the Circuit Court of Tazewell County, Virginia, by filing a petition with said court within sixty (60) days of the notice of the board's decision.

(Ord. of 1-11-11(1), § 6.1)

Sec. 8-92. Variances.

Variances are a request that the regulations contained in the ordinance not be applied to the applicant's proposed Development or Construction.

(Ord. of 1-11-11(1), § 6.2)

Secs. 8-93—8-100. Reserved.

ARTICLE VII. FACTORS TO BE CONSIDERED

Sec. 8-101. Factors to be considered.

Variances shall be issued only upon (i) a showing of good and sufficient cause, (ii) after the board of zoning appeals or board of supervisors has determined that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) after the board of zoning appeals or board of supervisors has determined that the granting of such variance will not result in (a) unacceptable or prohibited increases in flood heights, (b) additional threats to public safety, (c) extraordinary public expense; and will not (d) create nuisances, (e) cause fraud or victimization of the public, or (f) conflict with local laws or ordinances.

While the granting of variances generally is limited to a lot size less than one-half (½) acre, deviations from that limitation may occur. However, as the lot size increases beyond one-half (½) acre, the technical justification required for issuing a variance increases. Variances may be issued by the board of zoning appeals or board of supervisors for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the provisions of this section.

Variances may be issued for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that the criteria of this section are met, and the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

In passing upon applications for variances, the board of zoning appeals or board of supervisors shall satisfy all relevant factors and procedures specified in other sections of the County's ordinances and consider the following additional factors:

(1) The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any proposed use, development, or activity within any floodway district that will cause any increase in the 100-year flood elevation.

(2) The danger that materials may be swept on to other lands or downstream to the injury of others.

(3) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.

(4) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.

(5) The importance of the services provided by the proposed facility to the community.

(6) The requirements of the facility for a waterfront location.

(7) The availability of alternative locations not subject to flooding for the proposed use.

(8) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.

(9) The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.

(10) The safety of access by ordinary and emergency vehicles to the property in time of flood.

(11) The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site.

(12) The historic nature of a structure. Variances for repair or rehabilitation of historic structures may be granted upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

(13) Such other factors which are relevant to the purposes of this chapter.

The board of zoning appeals or board of supervisors may refer any application and accompanying documentation pertaining to any request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for flood protection and other related matters.

Variances shall be issued only after the board of zoning appeals or board of supervisors has determined that the granting of such will not result in (a) unacceptable or prohibited increases in flood heights, (b) additional threats to public safety, (c) extraordinary public expense; and will not (d) create nuisances, (e) cause fraud or victimization of the public, or (f) conflict with local laws or ordinances.

Variances shall be issued only after the board of zoning appeals or board of supervisors has determined that the variance will be the minimum required to provide relief.

The board of zoning appeals or board of supervisors shall notify the applicant for a variance, in writing and signed by title of appropriate public official, that the issuance of a variance to construct a structure below the 100-year flood elevation (a) increases the risks to life and property and (b) will result in increased premium rates for flood insurance.

A record shall be maintained of the above notification as well as all variance actions, including justification for the issuance of the variances. Any variances that are issued shall be noted in the annual or biennial report submitted to the Federal Insurance Administrator.

(Ord. of 1-11-11(1))

Secs. 8-102—8-110. Reserved.

ARTICLE VIII. EXISTING STRUCTURES IN FLOODPLAIN AREAS

Sec. 8-111. Existing structures in floodplain areas.

A structure or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:

(1) Existing structures in the floodway area shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard

engineering practices that the proposed expansion would not result in an increase in the base flood elevation of more than one (1) foot.

(2) Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use located in any floodplain areas to an extent or amount of less than fifty (50) percent of its market value shall conform to the VA USBC.

(3) The modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, regardless of its location in a floodplain area to an extent or amount of fifty (50) percent or more of its market value shall be undertaken only in full compliance with this chapter and shall require the entire structure to conform to the VA USBC.

(Ord. of 1-11-11(1))

Secs. 8-112—8-120. Reserved.

ARTICLE IX. OTHER PERMITS NOT TO BE ISSUED

Sec. 8-121. Other permits not to be issued.

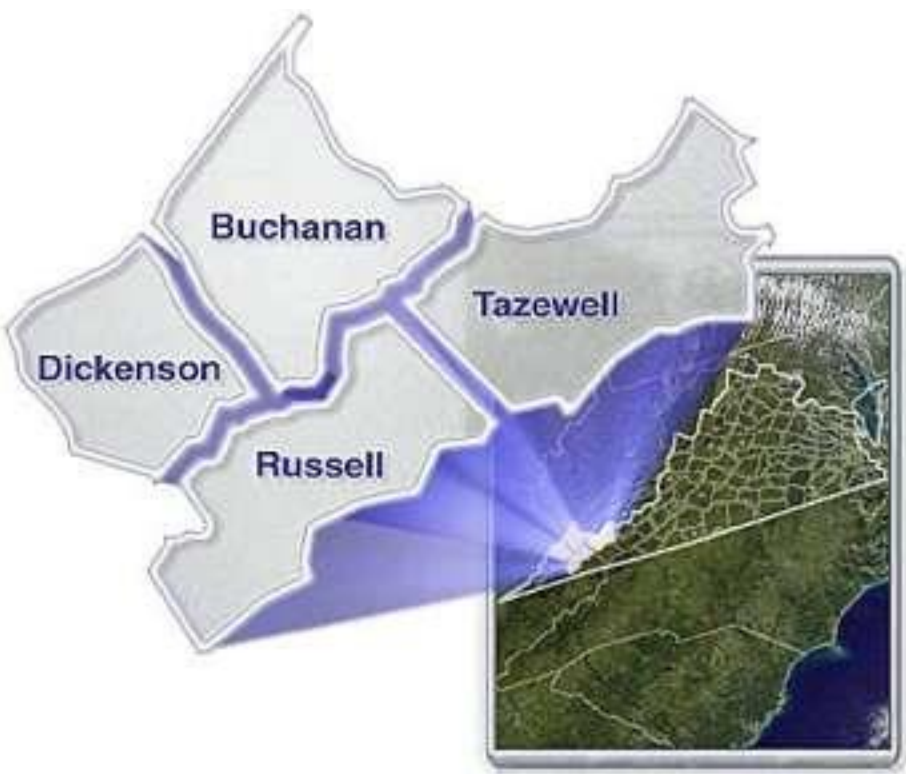
The office of building safety, or such other agency as may be delegated responsibility for enforcement of the building code, shall not issue a permit for development or construction on property located in flood districts without a letter of authorization from the ordinance administrator. The county engineer's office or such other agency as may be delegated responsibility for enforcement of the county's erosion and sediment control laws, shall not issue a permit for development or construction on property located in flood districts without a letter of authorization from the ordinance administrator.

(Ord. of 1-11-11(1))

Cumberland Plateau
Planning District Commission

Hazard Mitigation Plan Update

September 2018



Cumberland Plateau Planning District Commission
Hazard Mitigation Plan

TABLE OF CONTENTS

SECTION I. EXECUTIVE SUMMARY

For the purposes of this Hazard Mitigation Plan, the Cumberland Plateau Planning District is comprised of the counties of Buchanan, Dickenson, Russell and Tazewell and the towns of Grundy, Clinchco, Clintwood, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. Hereinafter and throughout the document, the area will be referred to as the Cumberland Plateau Planning District. The area is vulnerable to many types of natural hazards — including floods, tornadoes, winter storms, earthquakes, and severe thunderstorms — and has experienced the effects of each of these at some point in its history.

The last few decades of growth within the Cumberland Plateau Planning District have placed more development than ever in harm's way, increasing the potential for severe economic and social consequences if a major disaster or other catastrophic event were to occur today. Such an event could have the potential to cost the local governments, residents, and businesses millions of dollars in damages to public buildings and infrastructure, lost tax revenues, unemployment, homelessness, and emotional and physical suffering for many years to come.

A multi-hazard mitigation plan has been prepared for the Cumberland Plateau Planning District in accordance with the requirements of the Disaster Mitigation Act of 2000. Having the mitigation plan in place will help the area to:

- Better understand local hazards and risks;
- Build support for mitigation activities;
- Develop more effective community hazard-reduction policies and integrate mitigation concepts into other community processes;
- Incorporate mitigation into post-disaster recovery activities; and
- Obtain disaster-related grants in the aftermath of a disaster.

Hazard Identification and Risk Assessment

Prioritizing the potential hazards that can impact the Cumberland Plateau Planning District was based on the probability that a potential hazard will affect the area and the potential impacts on it for a given disaster event. Values were assigned to each hazard type, based on the hazard's highest potential hazard level. These hazard level categories represent the likelihood of a hazard event, which could significantly affect the Cumberland Plateau Planning District. These categories are based on the classifications used in the Hazard Identification portion of this document and are ***High, Medium,*** and ***Low.*** In order to focus on the most significant hazards, only those assigned a level of **High** or **Medium** have been included for analysis in the risk assessment.

Table I-1 summarizes the results of this analysis, which is explained more fully in Section V of this plan.

Table I-1 — Hazard Identification Results

Hazard Type	Hazard Level
Flooding	High
Severe Winter Storms	Medium
Wildfire	Medium
Landslides	Medium
Severe Wind	Medium
Severe Thunderstorms/Hail Storms	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Domestic Fire	Medium
Algae Bloom	Medium
Abandoned Mine Fire/Flood	Medium
Tornado	Low
Extreme Heat	Low
Karst	Low

The Mitigation Strategy

During the presentation of findings for the Hazard Identification and Risk Assessment workshop, the Mitigation Advisory Committee (MAC) was asked to provide comments and suggestions on actions and policies, which could lessen the area's vulnerability to the identified hazards. The MAC supported the following preliminary comments below:

- Top priorities for the area were public safety, public education, and reduction of potential economic impacts of disasters.
- Alternatives should consider the impacts on the Cumberland Plateau Planning District as a whole.
- Alternatives must not conflict with other local government programs.
- Outreach and other efforts should be attempted to repetitive loss properties, including those designated by FEMA.
- Past experiences from disasters should be built upon.
- The success of past mitigation projects should be considered in developing alternatives.

The following overarching goal and six specific goals were developed by the MAC to guide the area's future hazard mitigation activities.

OVERARCHING COMMUNITY GOAL:

"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."

- **GOAL1:**
  Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.
- **GOAL 2:**
  Protect new and existing public and private infrastructure and facilities from the effects of hazards.
- **GOAL 3:**
  Increase the area's floodplain management activities and participation in the National Flood Insurance Program.
- **GOAL 4:**
  Ensure hazard awareness and risk reduction principles are institutionalized into each local jurisdiction's daily activities, processes, and functions by incorporating them into policy documents and initiatives.
- **GOAL 5:**
  Enhance community-wide understanding and awareness of Cumberland Plateau Planning District hazards.
- **GOAL 6:**
  Publicize mitigation activities to reduce the area's vulnerability to the identified hazards.

Conclusion

This plan symbolizes the Cumberland Plateau Planning District's continued commitment and dedication to enhance the safety of its residents and businesses by taking actions before a disaster strikes. While each jurisdiction cannot necessarily prevent natural hazard events from occurring, they can minimize the disruption and devastation that so often accompanies these disasters.

SECTION II. INTRODUCTION

Mitigation

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials and other community stakeholders.

A local mitigation plan is the physical representation of a jurisdiction's commitment to reduce risks from natural hazards. Local officials can refer to the plan in their day-to-day activities and decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives. Additionally, these local plans will serve as the basis for states to prioritize future grant funding as it becomes available.

It is hoped that the Cumberland Plateau Planning District's hazard mitigation plan will be a tool for all community stakeholders to use by increasing public awareness about local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Teaching the public about potential hazards will help each of the area's jurisdictions protect themselves against the effects of the hazards, and will enable informed decision making on where to live, purchase property, or locate businesses.

The Local Mitigation Planning Impetus

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000), which established a national disaster hazard mitigation grant program that would help to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.

DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act and added a new section, §322 Mitigation Planning. Section 322 requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans for disasters declared after November 1, 2003, (subsequently revised to November 1, 2004) as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants and other forms of non-emergency disaster assistance. Local governments must review and if necessary, update the mitigation plan every five years from the original date of the plan to continue program eligibility.

Interim Final Rule Planning Criteria

As part of the process of implementing DMA 2000, The Federal Emergency Management Agency (FEMA) prepared an Interim Final Rule (the Rule) to define the mitigation planning criteria for States and communities. Published in the *Federal Register* on February 26, 2002, at 44 CFR Part 201, the Rule serves as the governing document for DMA 2000 planning implementation.

Organization of the Plan

This planning document has been organized in a format that follows the process enumerated in the Rule.

Section III - Planning Process describes the Cumberland Plateau Planning District's stakeholder involvement and defines the processes followed throughout the creation of this plan.

Section IV - Community Profile provides a physical and demographic profile of the Cumberland Plateau Planning District looking at such things as geography, hydrography, development, people and land uses within the three-county area.

Section V - Hazard Identification and Risk Assessment evaluates the natural hazards likely to affect the Cumberland Plateau Planning District, and quantifies whom, what, where, and how local jurisdictions may be vulnerable to future hazard events.

Section VI - Capability Assessment analyzes each of the four local jurisdiction's policies, programs, plans, resources, and capability to reduce exposure to hazards in the community.

Section VII - Mitigation Strategy addresses the Cumberland Plateau Planning District's issues and concerns for hazards by establishing a framework for loss-reduction activities and policies. The strategy includes future vision statements, goals, objectives, and a range of actions to achieve the goals.

Section VIII - Plan Maintenance Procedures specifies how the plan will be monitored, evaluated, and updated, including a process for continuing stakeholder involvement once the plan is completed.

Section IX - Appendices is the last section of the plan, and includes supplemental reference materials and more detailed calculations and methodologies used in the planning process. The Appendices also include commonly used mitigation terms and an acronym list.

SECTION III. PLANNING PROCESS

In 2003, the counties of Buchanan, Dickenson, Russell and Tazewell, Virginia, as members of the Cumberland Plateau Planning District, (referred to hereinafter as the Planning District) collaborated with the Virginia Department of Emergency Management to undertake a multi-jurisdictional natural hazards planning initiative. To facilitate the planning process, a Mitigation Advisory Committee (MAC) was established to 1) provide leadership and guidance for the planning initiative, and 2) develop a beginning set of goals to guide the development of a natural hazards mitigation plan. Currently this document is an update to that original plan with the addition of hazards that have effected the Planning District from 2011-partial 2018.

These goals were based on the principles of hazard awareness and disaster prevention. These goals included:

- Ensure that the Planning District has sustainable communities and businesses resistant to the human and economic costs of disasters;
- Maintain and enhance the economic stability, public health, and safety to the communities of the area;
- Ensure that the Planning District's cultural richness and environmental quality are not jeopardized by the occurrence of a disaster; and
- Recognize the potential impact of natural or manmade hazards on public and private buildings and facilities, and the utility and transportation systems that serve them.

Beginning in March 2011, the MAC held regular meetings and commenced work to identify and update the area's natural hazards. They coordinated and consulted with other entities and stakeholders to identify and delineate natural and manmade hazards within the four local jurisdictions and to assess the risks and vulnerability of public and private buildings, facilities, utilities, communications, transportation systems, and other vulnerable infrastructure. New FEMA Digital Flood Insurance Rate Maps were incorporated into the plan update. Neighboring counties adjacent to the planning district were contacted by the MAC as the planning process began. However, no response was received.

In addition, the MAC initially contacted all incorporated towns within the Planning District to solicit interest and input concerning participation in the development of a multi-jurisdiction hazard mitigation plan. Representatives from the towns participated in committee meetings throughout the process to again solicit their input for the inclusion of mitigation actions from each community into the mitigation strategy portion of the plan and to request adoption of the plan upon completion, as well. The communities' responses are incorporated into the final plan. Table III-1 provides more information on the individual MAC meetings.

Table III-1 — Mitigation Planning Workgroup Meetings	
CUMBERLAND PLATEAU PLANNING DISTRICT COMMISSION Steering Committee Participation	
Meeting Dates	Meeting Purpose
4/20/18	Kick-off Meeting
9/2018	Mitigation Strategy Development Meeting
10/2018	Second Mitigation Strategy Development Meeting
08/2019	Draft of Plan made available for public commentary
11/2019	Public Meeting

In September 2018, Cumberland Plateau Planning District Commission (Planning District) began to update the multi-hazard mitigation plan including a Hazard Identification and Risk Assessment (HIRA) and mitigation strategies. The Planning District worked with the stakeholders throughout the Planning District localities updating the past Hazard Mitigation plan to ensure that potential stakeholders participated in the process and would have opportunities for input in the draft and final phases of the plan update.

The Mitigation Advisory Committee and Mitigation Management Team

A Mitigation Advisory Committee (MAC) and Mitigation Management Team (MMT) comprised of public representatives, private citizens, businesses, and organizations worked with the Planning District and provided input on each section of the plan, including hazards addressed, mitigation actions, and prioritization. Efforts to involve county departments and community organizations that might have a role in the implementation of the mitigation actions or policies included invitations to attend meetings and serve on the MAC, e-mails of minutes and updates, strategy development workshops, and outreach through local government meetings and public libraries, plus opportunities for input and comment on all draft deliverables.

The Planning District would like to thank and acknowledge the following persons who served on the MAC, MMT and their representative departments and organizations throughout the plan update process:

Table III-2 — Cumberland Plateau Planning District Commission Mitigation Advisory Committee Members	
Robert Craig Horn	Buchanan County Board of Supervisors, Administrator
Dave Moore	Dickenson County Board of Supervisors, Administrator
Lonzo Lester	Russell County Board of Supervisors, Administrator
Eric Young	Tazewell County Board of Supervisors, Administrator
Tim Potter	Town of Grundy IDA, Director
James McGlothlin	Town of Cedar Bluff, Town Manager
Tim Taylor	Town of Richlands, Town Manager
Dr. Sue Cantrell	Cumberland Plateau Health District, Director
Keith Viers	Cumberland Plateau Regional Housing Authority, Director
Greg McClanahan	Buchanan County PSA, Director
Ron Phillips	Dickenson County PSA, Director
Edna Vance	Russell County PSA, Chairman
Dahmon Ball	Tazewell County PSA, Director
Steve Givens	Russell County Medical Center
Conrad Hill	VDOT
Steve Dye	Russell County Sheriff's Department
Richard Thacker	Dickenson County Emergency Services
Dr. Tommy Wright	Southwest Virginia Community College
Patty Tauscher	American Red Cross
Jess Powers	Russell County, Emergency & Hazardous Material Coordinator
Matt Slemp	Dickenson County, 911 Coordinator
Dave White	Tazewell County, Emergency & Hazardous Material Coordinator
Ricky Bailey	Buchanan County, 911 Coordinator
Mike Watson	Town of Bluefield, Manager
Terry McReynolds	Russell County Assessor
Robert Brandon	Southwest Virginia CC
Rick Chitwood	Thompson & Litton Engineering
Henry Stinson	Russell County Highway & Safety Commission
James Baker	Thompson & Litton Engineering
Matt Anderson	Tazewell County, Planner/Engineer
Shane Farmer	Cumberland Plateau PDC

Cumberland Plateau Planning District Commission Hazard Mitigation Plan Update	
Table III-2 — Cumberland Plateau Planning District Commission Mitigation Advisory Committee Members	
Susan Mullins	Dickenson County Schools
Darrell Johnson	Castlewood Water & Sewage Authority Chairman
Jarvis Deel	Town of Clinchco, Mayor
C. H. Wallace	Town of Honaker, Mayor
Mark Mitchell	Town of Lebanon, Town Manager
Larry Yates	Town of Haysi, Mayor
Jennifer Chumbley	Town of Cleveland, Mayor
Benjamin Gibson	Town of Pocahontas, Mayor
Todd Day	Town of Tazewell, Town Manager
Mickey Rhea	Russell County Building Official
Roger Sword	Russell County IDA
George Brown	Tazewell County Schools
Gary Jackson	Tazewell County Building Official
Dr. Greg Brown	Russell County Schools, Superintendent
Susan Reeves	Tazewell County Planning Commission, Chairman
Brian Hieatt	Tazewell County Sheriff's Department
Ray Foster	Buchanan County Sheriff's Department
Don Layne	Buchanan County Planning Commission, Chairman
Melanie Hibbitts	Buchanan County Schools, Superintendent
Chris Rakes	Dickenson County Building Official
Ginger Senter	Dickenson County IDA
Scott Stanley	Dickenson County Sheriff's Department
Peter Mulkey	Clinch Valley Medical Center, CEO
Robert Ruchti	Buchanan General Hospital, CEO
Angela Beavers	Cumberland Plateau PDC
Donald Baker	Town of Clintwood, Mayor

Cumberland Plateau Planning District Commission Hazard Mitigation Plan Update	
Table III-3 — Cumberland Plateau Planning District Commission Hazardous Mitigation Management Team	
Richard Thacker	Dickenson County Emergency Services
Jess Powers	Russell County, 911 Coordinator
Matt Slemp	Dickenson County, 911 Coordinator
Derrick Ruble	Tazewell County, 911 Coordinator
Ricky Bailey	Buchanan County, 911 Coordinator
David White	Tazewell County Emergency Services
Jess Powers	Russell County Emergency & Hazardous Material Coordinator
Shane Farmer	Cumberland Plateau PDC
Jerry Ward	Buchanan County Asst. Emergency Coordinator
Angela Beavers	Cumberland Plateau PDC

Public Participation and Citizen Input

Several opportunities were provided to the public for input and participation throughout the planning process. Drafts of the Hazard Identification and Risk Assessment and Mitigation Strategies were made available via the project team website. The planning process was discussed on a regular basis at the Cumberland Plateau Planning District Commission board meetings, which includes representation of all counties and towns in the planning district. Additionally, the plan was discussed at Board of Supervisor meetings in the participating counties.

In August 2019, a copy of the Draft Hazard Mitigation Plan was made available online for public comments, with any interested parties encouraged to contact CPPDC for a hard copy of the plan at their request. Copies of the announcements notifying the public of the availability of the draft plan for review is included in Appendix D. There were no comments offered by the public on the draft copy.

The Emergency Managers of the four counties were contacted for their input and to schedule a meeting in October 2018. A copy of the email to these Emergency Managers is available in Appendix D.

In addition, an open public meeting was held in November 2019 at 11:00 a.m. at the Southwest Virginia Community College in Richlands to provide an overview to the public of the planning process and the results of the hazard identification and mitigation strategy. The meeting date was advertised in the local papers. Also, draft copies of the complete plan are also available on the Cumberland Plateau PDC website at www.cppdc.org for review and comment by the public.

Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
510161#	BLUEFIELD, TOWN OF	TAZEWELL COUNTY	8/9/1974	7/17/1978	2/18/2011	7/17/1978	No
510024#	BUCHANAN COUNTY*	BUCHANAN COUNTY*	7/7/1978	9/16/1988	8/19/1997	9/16/1988	No
510162#	CEDAR BLUFF, TOWN OF	TAZEWELL COUNTY	5/10/1974	4/4/1983	2/18/2011	4/4/1983	No
515522	CLEVELAND, TOWN OF	RUSSELL COUNTY	7/1/1970	5/14/1976	9/29/2010	2/19/1971	No
510384#	CLINCHCO, TOWN OF	DICKENSON COUNTY		9/29/2010	9/29/2010	11/8/2011	No
510253#	DICKENSON COUNTY *	DICKENSON COUNTY	6/2/1978	2/6/1991	9/29/2010	2/6/1991	No
510025#	GRUNDY, TOWN OF	BUCHANAN COUNTY	5/24/1974	8/16/1982	8/19/1997	8/16/1982	No
510046#	HAYSI, TOWN OF	DICKENSON COUNTY	5/31/1974	1/17/1979	9/29/2010	1/17/1979	No
510321#	HONAKER, TOWN OF	RUSSELL COUNTY	5/10/1974	4/5/1988	9/29/2010	4/5/1988	No
510222#	LEBANON, TOWN OF	RUSSELL COUNTY	5/10/1974	1/16/1987	9/29/2010	1/16/1987	No
510337#	POCAHONTAS, TOWN OF	TAZEWELL COUNTY	9/14/1983	9/14/1983	2/18/2011	9/14/1983	No
510163#	RICHLANDS, TOWN OF	TAZEWELL COUNTY	6/18/1976	4/4/1983	2/18/2011	4/4/1983	No
510317#	RUSSELL COUNTY*	RUSSELL COUNTY	9/16/1977	3/16/1988	9/29/2010	3/16/1988	No
515530#	ST. PAUL, TOWN OF	RUSSELL COUNTY	6/16/1970	7/23/1976	2/18/2011	12/4/1970	No
510160#	TAZEWELL COUNTY *	TAZEWELL COUNTY	6/2/1978	9/1/1983	2/18/2011	9/1/1983	No
510164#	TAZEWELL, TOWN OF	TAZEWELL COUNTY	5/17/1974	8/15/1983	2/18/2011	8/15/1983	No

Communities Not in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Sanction Date	Tribal
510045#	CLINTWOOD, TOWN OF	DICKENSON COUNTY	3/4/1977	2/6/1991	9/29/2010	3/4/1978	No

Adoption

Participating jurisdictions must formally adopt the hazard mitigation plan in order for it to be approved by the State of Virginia and the Federal Emergency Management Agency. This plan was adopted by the Counties of Buchanan, Dickenson, Russell and Tazewell and the towns of Grundy, Clinchco, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. The town of Clintwood did not participate in the flood program. Copies of the adoption language for each community is included in Appendix E.

SECTION IV. COMMUNITY PROFILE

Introduction

The Cumberland Plateau Planning District Commission was created to promote regional cooperation and coordinate regional activities and policies. Since 1968, the CPPDC has initiated and operated many programs designed to improve the quality of life for Southwest Virginians through job creation, technical assistance grantsmanship, management services, GIS services, public works, waste management, transportation planning, shell building construction, industrial park management and development financing. This profile is based largely on information directly from the Cumberland Plateau Planning District Commission's website at http://www.cppdc.org/index.htm.

Geography

The Cumberland Plateau Planning District is 67 miles long and 40 miles wide and covers approximately 1,848 square miles as shown in Figure IV-1. It borders West Virginia on the north and Kentucky on the northeast. Wise, Scott, Washington, Smyth and Bland Counties in Virginia form the boundaries on the west, south and east. The District is divided into two physiographically distinct regions, both lying in the Appalachian Highlands. The counties of Buchanan and Dickenson, along with the northern portions of Russell and Tazewell Counties, lie in the Cumberland Plateau which is, in turn, a part of the Appalachian Plateau. This area has a uniformly mountainous surface characterized by many small streams separated by sharply rising ridges, steep slopes, and narrow valleys. The remaining region of the District, comprising the greater portion of Russell and Tazewell Counties, lies in the Valley and Ridge Province of the Appalachian Highlands. This belt, consisting of alternate valleys and ridges is bordered on the south by the Clinch Mountains and on the north by the Cumberland Plateau. Elevations vary from 845 feet above sea level to 4,705 feet above sea level.

Figure IV-1 — Cumberland Plateau Planning District Commission

http://www.cppdc.org/index.htm

Climate

The Cumberland Planning District is located in the northeastern Appalachian region of the United States and enjoys a seasonal climate, with an average high temperature of 75.2 degrees Fahrenheit and an average low temperature of 35.9 degrees Fahrenheit. Virginia's climate results from global-scale weather patterns that are modified by the diverse landscape of the Commonwealth. The state's landscape provides local controls primarily in three ways. First, the Atlantic Ocean and its "river" of warm water, commonly called the Gulf Stream, play a dominant role in differentiating Virginia's precipitation climate. Winter storms generally move or "track" from west to east and, in the vicinity of the east coast, move northeastward paralleling the coast and the Gulf Stream. This shift to a northeast track results in part from the tendency of the storm to follow the boundary between the cold land and the warm Gulf Stream waters. These storms grow rapidly as they cross the coast; and as they move northeastward, moisture-laden air from the storm crosses Virginia from the east and northeast. The eastern slopes and foothills of the Blue Ridge Mountains are the prime recipients of this moisture. The great coastal storms of 1962, which are remembered primarily because of the high surf and storm surges along Virginia's coast, also produced record snowfalls along the northern section of the Blue Ridge Mountains.

The high relief of the Appalachian and Blue Ridge mountain systems also helps to control Virginia's climate. The influence here originates with the well-developed rainfall pattern that is evident along the great mountains of the western margin of North America. Great quantities of rain fall on these western slopes as moist air from the Pacific Ocean flows eastward, rises, condenses, and precipitates. As the air flows down over the eastern slopes, however, little rain falls and a "rain shadow" pattern results. Along the Appalachian and Blue Ridge Mountains of western Virginia, this airflow is sometimes from the west and sometimes from the east. When the flow is from the west, the New River and Shenandoah River valleys are in the rain shadow of the Appalachian Mountains; when the airflow is from the east, they are in the shadow of the Blue Ridge Mountains. As a result, both the New River and the Shenandoah River valleys are the driest portions of the state. Regions of equally low rainfall are rare in the eastern United States (although common along the eastern margins of the great plains of the central United States).

The third important local control on climate is the state's complex pattern of rivers and streams, which drain the precipitation that falls and modify the pattern of moist airflow from which the precipitation falls. These river systems drain the Commonwealth's terrain in all four geographical directions. In far southwestern Virginia, the Clinch and Holston rivers drain south into North Carolina and Tennessee. The New River drains westward into the Ohio River, while the Shenandoah River drains northward into the Potomac. Finally, the Roanoke, James, York, and Rappahannock rivers drain eastward through the Piedmont and into the Tidewater area. The air that flows across Virginia flows either up these river valleys or over the crests of the mountains and down into the valleys. With a southerly flow of air, for example, moist air would move up the Holston River drainage, and rainfall would increase up valley with increasing elevation. However, this same southerly airflow would be downhill into the New River drainage, and on toward the Ohio River basin. This downward flow of air is not conducive to rainfall.

Weather Systems

Much of Virginia's rainfall results from storms associated with warm and cold fronts. As already noted, these storms generally move from west to east and, in the vicinity of the east coast, move northeastward. While a very large number of specific storm histories and storm tracks can occur and a great diversity of precipitation patterns can result, not all are equally common. Storms are most frequently observed to move parallel to the Appalachian or the Blue Ridge Mountains, the coastal zone, and the Gulf Stream, all of which have a northeast trend, or to move parallel to the Great Lakes and the Ohio River Valley. When storms cross the east coast well to the south of Virginia and move offshore, the heaviest rain usually falls in southeastern Virginia. When these storms become very intense or when they closely skirt the coastline, the strong up-slope winds result in heavy rainfalls on the Blue Ridge. Frequently, frontal storms tracking along the Ohio Valley move across southern Pennsylvania and off the New Jersey coast; as such storms approach the coast, great quantities of moist air flow inland and then southward into Virginia.

When sufficient cold air invades Virginia from the west and northwest, frontal storms may cause heavy snowfalls. Two of the state's most dramatic frontal snowstorms of recent years occurred during the Christmas holidays of 1966 and 1969. In both cases, the storm tracked along the Gulf and the east coasts and crossed over Tidewater Virginia; a strong east and northeast flow brought moist air across the state, overriding cold air from the west. While heavy snows are common in the Piedmont region, the average winter does not have a major coastal snowstorm, and heavy winter snows usually are confined to the mountainous areas of the state. As remarkable as it may seem, some of the heaviest snowfalls in the eastern United States occur in the Appalachians of West Virginia, just a few miles west of Highland County, Virginia. More than 2,500 millimeters (100 inches) fall annually in this area; but Virginia, being in West Virginia's snow shadow, receives only a fraction of this amount.

While heavy snowfalls usually result from frontal storms, hurricanes are created by a different weather pattern. Hurricanes and tropical storms are intense cyclones formed within the deep, moist layers of air over warm, tropical waters. Unlike frontal storms, which derive much of their energy from the great temperature contrasts on either side of fronts, hurricanes and tropical storms derive most of their energy from the warm ocean surface. Tropical storms over the low-latitude oceans generally move from east to west. As they move westward, they are displaced farther and farther to the north. Eventually, they enter the westerly airstreams of the mid-latitudes, and then recurve north and eastward. In the vicinity of Virginia, these tropical storms move in a general northeasterly track, like frontal storms: and as they move along this route, they intensify. Those storms that reach an intensity indicated by sustained winds of at least seventy-four miles an hour are classified as hurricanes.

Thunderstorms, which occur in all months of the year, are most common in the deep, moist, warm air of tropical origin that is typical of summer. In Virginia, days with thunderstorms are recorded at commercial and military airports. Over the last two decades the state has averaged one thunder-storm day a decade in January, compared with nine thunderstorm days a month in July. Thunderstorm days are most frequent in southern Virginia, particularly in the far southwestern section, while northern Virginia experiences the least number of such storms. Thunderstorms also are most likely to occur during the warmest part of the day, with 4:00 p.m. the most probable time of occurrence. In Roanoke, for example, thunderstorms occur ten times more frequently at 4:00 p.m. than at 10:00 a.m. and five times more frequently at 4:30 p.m. than at 7:00 p.m. At Norfolk, thunderstorms are also most frequent at 4:00 p.m., remaining common there until about midnight. Thunderstorms produce complex patterns of rainfall, such that areas of heavy rain may be next to areas with little or no rain.

Population

Almost 108,681 people live in the Cumberland Plateau Planning District. The population is spread out over 1,830 square miles resulting in a 59.39 people per square mile density. Tazewell County's density (82.50 people per square mile) is quite a bit higher than the planning area as a whole.

According to the Census Bureau the population of the Cumberland Plateau Planning District has been declining since the 1980s after experiencing high rates of growths in the previous decade. This decline slowed between 1990 and 2000. Table IV-1 shows the Census 2010 population for the planning area, estimates of the 2015 population, and the growth rates since 1970.

Table IV-1 — Population and Growth Rates for Cumberland Plateau

	CPPDC	Buchanan	Dickenson	Russell	Tazewell
2015 Estimates*					
Total	108,681	22,776	15,115	27,891	42,899
Census 2010 Population					
Total	113,976	24,098	15,903	28,897	45,078
Change					
2011-2015*	-4.64%	-5.48%	-4.95%	-3.48%	-4.83%
2000-2010	-3.64%	-10.67%	-3.0%	-4.65%	1.07%
1990-2000	-2.87%	-8.7%	-3.6%	3.5%	-2.6%
1980-1990	n/a	-17.4%	-10.9%	-9.6%	-8.9%
1970-1980	n/a	18.5%	23.2%	29.5%	26.9%

***2011-2015 estimates based on US Census Bureau American Community Survey**

According to the 2010 American Community Survey collected for the United States Census Bureau, almost 70% of the planning area's population lived in the same home between 1995 and 2010. This indicates that residents tend not to be residentially mobile and may be more familiar with their surroundings and the associated natural hazards.

According to the 2011-2015 Census estimates, Cumberland Plateau's population is balanced between the genders with 50% of the population being male. A breakdown of the population by race can be found in Table IV-2.

Table IV-2: Cumberland Plateau Planning District - Racial Composition*	
White persons, percent, 2010	**96.23%**
Black or African American persons, percent, 2010	**1.95%**
Asian persons, percent, 2010	**0.36%**
Persons of Hispanic or Latino origin, percent, 2010	**0.66%**
2011-2015 Estimates by U.S.Census Bureau	
White persons, 2015 estimate	**97.60%**
Black of African American persons, 2015 estimate	**2.1%**
Asian persons, 2015 estimate	**0.3%**
Persons of Hispanic or Latino origin, 2015 estimate	**0.8%**

2011-2015 US Census American Community Survey data also reveals insights into potential special needs populations such as minors and seniors. Within the planning district, more than 5% of the population is under 5 years, 22% is under 18 years, and 18% is over 65 years old. In addition, about 27% of the population over the age of 5 years has a disability as defined by the 2010 U.S. Census. The 2010 Census American Community Survey data shows that language barrier issues may not be of concern for the Cumberland Plateau Planning District. Less than 2% of the population speaks a language other than English at home and less than one percent are foreign-born.

Almost 69% of residents graduate from high school but less than 11% percent hold bachelor's degrees or higher. These numbers, coupled with the population characteristics described in the previous paragraph are important to keep in mind when developing public outreach programs. The content and delivery of public outreach programs should be consistent with the audiences' needs and ability to understand complex information.

The average per capita household income of $20,233 is about 56% of the state per capita income of $36,206. About 17% of residents within the Cumberland Plateau planning area live below the poverty line. This rate is significantly higher than the national rate of 12.7% and the state rate of 8.20%. These numbers may indicate that a large portion of the population will not have the resources available to them to undertake mitigation projects that require self-funding.

Housing

There are over 53,025 housing units within the planning area. Approximately 5.0% are multi-family units. In Buchanan County, only 4.1% of the units are in multi-family dwellings while 7.2% of Tazewell County's units are in multi-family units. Over 77.4% of residents own their own homes, significantly higher than the national average of 66.6.% or the state average of 68.9%. The housing characteristics are broken down by jurisdiction in Table IV-3.

Table IV-3 — Housing Characteristics*

	Buchanan County	Dickenson County	Russell County	Tazewell County	Total/Average
Housing units, Census ACS 2012-2016	11,443	7,517	13,409	20,656	53,025 total 13,256 avg.
Median value of owner-occupied housing units, ACS 2012 - 2016	$70,500	$72,700	$94,100	$94,400	$82,925
Homeownership rate, 2012-16 Census Bureau Est.	78.9%	76%	77.9%	768%	77.4%
Housing units in multi-unit structures, percent, 2011-2015 ACS	4.1%	5%	3.8%	7.2%	5%

**All data is US Census Bureau American Community Survey Estimates, unless otherwise noted*

Labor and Industry

The three main industries in the CPPDC planning area are the coal, natural gas and the customer contact (telecenters) industries. The top five employers in each county are:

♦ Buchanan County

- Buchanan Minerals LLC
- Buchanan County School Board
- Sykes Enterprises
- Rapoca Energy Company
- Keen Mountain Correctional Institute

♦ Dickenson County

- Paramont Coal Company
- Dickenson County School Board
- Serco Inc.
- County of Dickenson
- Enervest Employee Services, LLC

♦ Russell County

- Russell County School Board
- Samuel Son Co USA Inc
- Wal-Mart
- County of Russell
- CGI Federal Inc

♦ Tazewell County

- Tazewell County School Board
- Wal-Mart
- Clinch Valley Community Hospital
- Cumberland Mountain Community Services
- Revelation Energy LLC

Natural Resources

Coal remains the most abundant resource. Based on the Static Reserve Index (Reserves current annual production) the reserves would be depleted in 36 years. According to the Virginia Center for Coal and Energy Research there are less than 2,160 million tons, which would be mined out in less than 45 years. The Virginia Division of Mineral Resources gives a range of recoverable reserves of 1,995 to 4,393 million tons, which would last 44 to 98 years. Whether the coal resources will be depleted in 36 or 98 years, coal mining will remain a major economic activity for the foreseeable future. Additionally, a major portion of the known gas fields in Virginia are located in the Cumberland Plateau Planning District and most of the area is either covered by or suitable for hardwood forest growth.

Transportation

The District is served by three major U.S. highways (U.S. 19, U.S. 460, and U.S. 58), nine primary state highways, and numerous state secondary roads. No interstate highways pass directly through the planning area, though I-81 is easily accessible via U.S. 19 and U.S. 16.

CSX Transportation and Norfolk Southern provide industrial rail service to the district. These rail lines are used primarily to transport coal to power plants in the Southeast and to shipping nodes in Norfolk, Virginia.

The planning district is served by four commercial airports: Tri-Cities Airport (Tennessee), Roanoke Regional Airport, and Mercer County Airport. In addition, a general aviation facility is located near Richlands.

SECTION V. HAZARD IDENTIFICATION & RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) serves as a guide to all communities in the Cumberland Plateau planning area when assessing potential vulnerabilities to natural hazards. When developing this plan, every effort was made to gather input from all aspects of the project area communities to assure that the results of this analysis will be as accurate as possible.

The planning area for this study includes Buchanan County, Dickenson County, Russell County, and Tazewell County. All jurisdictions located throughout these counties also have been included in this portion of the study, as this analysis has been completed on a regional basis.

The purpose of this HIRA is to:

1) Identify all the natural hazards that could affect the Cumberland Plateau planning area;
2) Assess the extent to which the area is vulnerable to the effects of these hazards; and
3) Prioritize the potential risks to the community.

The first step, identifying hazards, will assess and rank all the potential natural hazards, in terms of probability of occurrence and potential impacts. It will also identify those hazards with the highest likelihood of significantly impacting the community. This section will be completed based on a detailed review of the Cumberland Plateau planning area's hazard history. The hazards determined to be of the highest risk will be analyzed further to determine the magnitude of potential events, and to characterize the location, type, and extent of potential impacts. This will include an assessment of what types of development are at risk, including critical facilities and community infrastructure.

Hazard Identification

While there are many different natural hazards that could potentially affect the communities within the Cumberland Plateau Planning District, some hazards are more likely to cause significant impacts and damages than others. Although reducing the community's vulnerabilities to all hazards is ideal, the highest level of consideration must be given to those hazards which pose the greatest possible risk. This analysis will attempt to quantify these potential impacts for all possible hazard events, and identify those which could most significantly impact the communities involved. Once these hazards have been identified, further analysis will be conducted to profile potential hazard events and to assess vulnerability to such events.

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards (based on local official knowledge and professional judgment) that could potentially affect the communities in the Cumberland Plateau Planning District generally include:

- Dam Failures
- Drought
- Earthquake
- Flooding
- Landslides
- Karst Topography
- Extreme Heat
- Abandoned Mine Fire/Flood
- Severe Thunderstorms
- Severe Wind
- Severe Winter Storms
- Tornadoes
- Wildfires
- Domestic Fires
- Algae Blooms

Depending on the severity, location, and timing of the specific events, each of these hazards could have devastating effects on homes, business, agricultural lands, infrastructure and ultimately citizens.

In order to gain a full understanding of the hazards, an extensive search of historic hazard data was completed. This data collection effort utilized meetings with local community officials, existing reports and studies, state and national data sets, and other sources. A comprehensive list of sources utilized for this plan can be found at the conclusion of this document.

Unfortunately, extensive local historical data is not currently available for many of the potential hazards. In some cases, the precise number of events that have affected the Planning District and the subsequent level of impact to the local communities are not known. In these cases, state and regional hazard information was collected and referenced whenever possible.

Probability of Hazards

The historical data collected includes accounts of all the hazard types listed above. However, some hazards have occurred much more frequently than others with a wide range of impacts. By analyzing the historical frequency of each hazard, along with the associated impacts, the hazards that pose the most significant risks to the Cumberland Plateau Planning District can be identified. This analysis will allow the local communities to focus the Mitigation Strategy of those hazards that are most likely to cause significant impacts.

Prioritizing the potential hazards that can threaten the Planning District will be based on two separate factors:

- The probability that a potential hazard will affect the community, and
- The potential impacts on the community in the event such a hazard occurs.

The probability of a hazard event occurring is largely based on the historical recurrence interval of the hazard. For instance, if flood damage occurs every 5 years versus an earthquake event causing damage every 50 years, the flood probability would score higher than the earthquake.

The hazard's impact on the community is made up of three separate factors: the extent of the potentially affected geographic area, the primary impacts of the hazard event, and any related secondary impacts. While primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road closures due to submerged pavement. A possible secondary impact in these circumstances would be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure.

Level of Hazard

A formula has been developed to assign a value for probability and impact for each of the hazards considered. A *Hazard Analysis Worksheet,* as well as a detailed description of all the calculations and formulas utilized, is included as Appendix A of this document. As a result of this analysis, the hazards were broken down into four distinct categories which represent the level of consideration they will receive throughout the planning process. These categories are *High, Medium,* and *Low.*

In order to focus on the most critical hazards that may affect the Planning District communities, the hazards assigned a level of *High* will receive the most extensive attention in the remainder of this analysis, while those with a *Medium* planning level will be discussed in more general terms. Those hazards with a planning level of *Low* have not been addressed in this plan. The level of *Low* should be interpreted as not being critical enough to warrant further evaluation; however, these hazards should not be interpreted as having zero probability or impact. Table V-1 summarizes the results of the hazard level analysis.

Table V-1 — Hazard Identification Results

Hazard Type	Hazard Level
Flooding	High
Severe Winter Storms	Medium
Wildfire	Medium
Landslides	Medium
Severe Wind	Medium
Severe Thunderstorms/Hail Storms	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Domestic Fire	Medium
Algae Bloom	Medium

Table V-1 — Hazard Identification Results

Abandoned Mine Fire/Flood	Medium
Tornado	Low
Extreme Heat	Low

Because the types of the hazards discussed above are similar, some hazards will be discussed simultaneously later in this analysis. For instance, the analysis of severe wind encompasses severe thunderstorms, hurricanes, and tornadoes. In addition, the impacts of a dam/levee failure are covered by the flood analysis. A detailed discussion of the potential hazards that have been identified as high and medium-high level events will be addressed.

Extreme heat was identified in the hazard identification as a "low" level of concern for the Planning District. Generally, extreme heat is defined as temperatures that are 10 degrees or more above the average high temperature for the region during summer months, last for a prolonged period of time, and often are accompanied by high humidity levels. Given the probability and likely limited impacts of this hazard, it was ranked a "low" level for planning consideration. Detailed analysis was not considered needed.

In addition, Karst topography was also identified as a "low" level of concern for the planning district. Karst is a distinctive landscape topography largely formed by the dissolving of carbonate bedrocks such as limestone, dolomite, or marble by water. Karst topography causes unusual surface conditions such as sinkholes, caves, disappearing streams, springs, and vertical shafts. Although Karst topography is present throughout the Planning District, historic losses and damages have been low. Much of the Karst areas throughout the region have been identified, and its presence limits future development in some areas, it does not pose a significant threat for damages and loss of life.

Flooding

The most significant and frequent natural hazard to effect the Cumberland Plateau Planning District (CPPD) is flooding. The Planning District is a mountainous region with steep ridges and pronounced valleys, with three major watersheds, the Clinch River Basin, which flows through Tazewell and Russell Counties, the Levisa and Russell Forks of the Big Sandy River, which flow through Buchanan and Dickenson Counties and the Bluestone River Basin, which flows through Tazewell County. A number of smaller steams and tributaries are located within these watersheds. Watersheds in the Planning District that have minimal impact and flooding information, and therefore, are not part of this study are: the Tug Fork watershed, located in the northern portion; the Wolf Creek watershed located in the eastern portion; and the headwaters of the Holston River watershed, located in the southeastern portion of the Planning District.

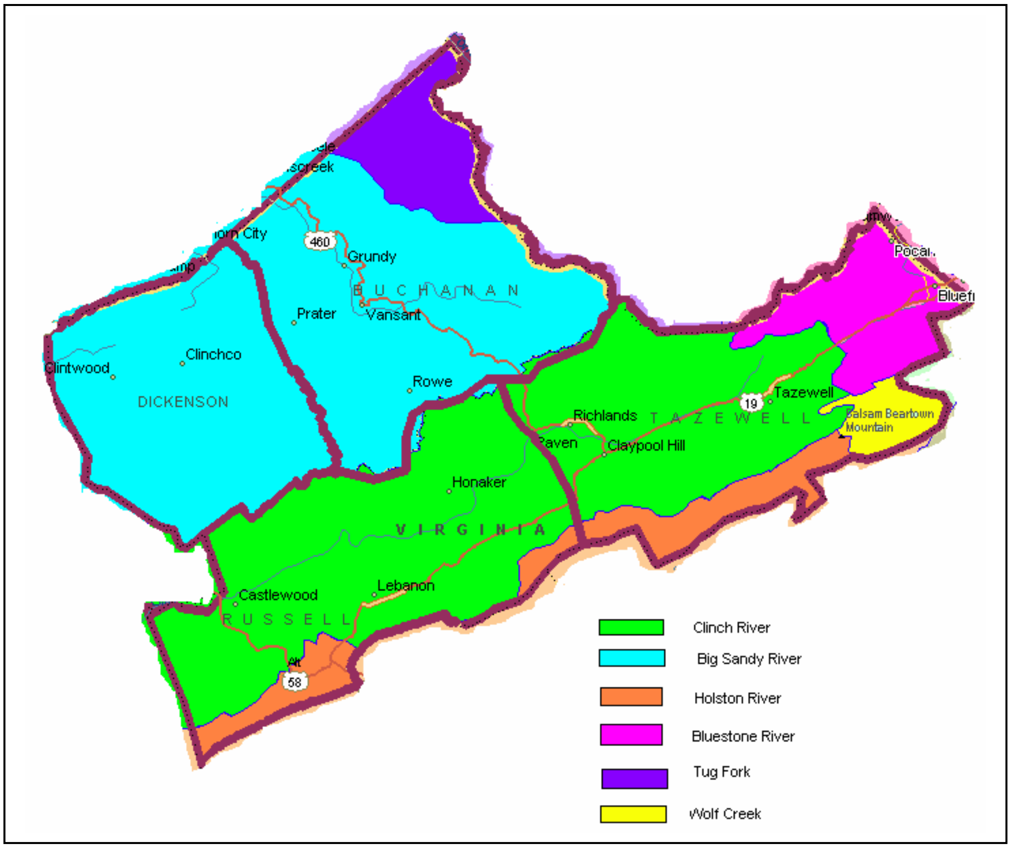


Figure V-1 — Cumberland Plateau Watersheds

Hazard History

The following sections include a description of the known flood history by major watershed. Because a majority of the flood history and flood data available for the area is organized by watershed (as opposed to by county), the discussion of flood characteristics for the CPPD also have been organized by watershed.

A list of repetitive loss properties in the Planning District are as follows in the chart below:

Community	Total # of Repetitive Loss Properties	# Residential	# Commercial
Bluefield	12	5	7
Buchanan County	6	5	1
Buchanan Town	6	2	4
Dickenson County	2		2
Tazewell County	15	13	2
Tazewell Town	2		8
Grundy Town	10	2	1
Richlands Town	11	10	1
Pocahontas Town	1		1
Haysi Town	1		1

Clinch River Basin

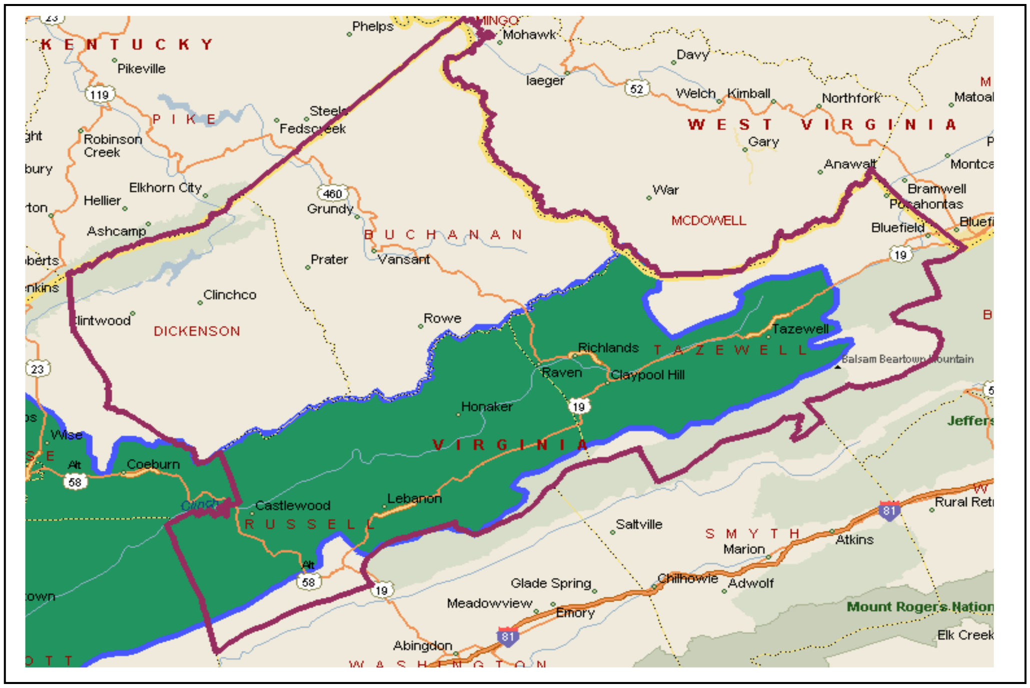


Figure V-2 — Clinch River Basin

The Clinch River is a major river located in Russell and Tazewell Counties, with a drainage area of approximately 670 square miles. The Clinch River is fed by numerous tributaries, originating from the high mountain ridges throughout the drainage area. The primary tributaries to the Clinch are the Guest River, flowing from the northwestern portion (Wise County) of the watershed and the Little River, flowing from the east near the headwaters of the watershed in Tazewell County. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

Records of historic events in the Planning District are numerous; floods on the Clinch and its tributaries have been well documented.

The determined flood stage for the Clinch is 16 feet at Cleveland in Russell County. There have been approximately 29 recorded floods since 1862 that have crested above this level on the Clinch. The two largest recorded floods occurred in April, 1977 and January, 1957 with the river cresting at approximately 26.4 feet at Cleveland. As for most floods in this area, much information is not available regarding damages due to these events. A Tennessee Valley Authority report produced in 1964 provides much information of previous floods and compares all floods to the January 30, 1957 flood. Records from this event indicate that several buildings were inundated with floodwaters, and roadways were blocked. Velocities of water in the 1957 flood ranged from 7 feet per second in the river channel and up to 4 feet per second on the flood plain in the Cleveland vicinity. During a Maximum Probable Flood the crest would be 12 to 16 feet higher than the 1957 flood, velocities in the channel would range up to 12 feet per second and up to 8 feet per second in the flood plain.

The most recent flood event on the Clinch River occurred February 16, 2003. A strong but slow moving, storm system developed in the lower Mississippi Valley the morning of February 13, 2003 and moved northeast toward the southern Appalachian region. Several inches of snow had fallen across region earlier in the week, with snow pack depths varying with terrain and location. It was estimated on the 13th that up to 10 inches of snow still lay on the ground on the higher ridges and mountains, especially across southwest Virginia in the Holston, Clinch, and Powell river headwater areas. By the morning of the 16th, the ground across the southern Appalachian region was fully saturated, with small streams everywhere flowing out of their banks, and larger streams and rivers starting to show either significant rises or flooding. While no rivers reached new record levels, the widespread nature of the event, the number of people affected in a significant way, and the dollar amount of damage combined to make this flood event memorable (NOAA).

Table V-2 includes flood heights for events on the Clinch River compiled from a study completed by the TVA report of 1964 and 1977, and from USGS gauge data (TVA, USGS). The events shown are those with crest levels higher than 16 feet, the flood stage on the Clinch. It should be noted that gauge readings prior to 1957 have been adjusted to the present gage location, and from personal accounts and high water marks.

Table V-2 — Historical Flooding on the Clinch River
TVA 1964 and 1977, USGS

OCCURANCE	LOCATION	Height at Cleveland Gage (Zero = 1500.24 FT)	DETAILS
March, 1826	Clinton, Tennessee		Greatest known flood on the Clinch River. No information obtained about flood. Probably a great flood occurred in upper reaches of the river in the Planning District.
February 22, 1862	Clinch River Area	1523.0 ft.	Highest known flood over most of the Clinch River area.
March, 1867	Dungannon		No records, but residents say that flood was exceeded only by the flood of 1862
March 31, 1886	Clinton, Tennessee		Only minor flooding in the Planning District
April 1, 1896	Speers Ferry		First known flood reported in the records at Speers Ferry. Not a major flood up stream
February 22, 1897	Clinch River Area		Minor flooding, no high water marks found.
June 22, 1901	Entire river		Intense storms in the head water area caused great damage and loss of life in the Richlands area.
March 1, 1902	Clinch River Area	1520.5 ft.	One of the largest known floods in the area. Washouts and slides occurred on the Clinch Valley Division of the Norfolk and Western

Table V-2 — Historical Flooding on the Clinch
TVA 1964 and 1977, USGS

OCCURANCE	LOCATION	Height at Cleveland Gage (Zero = 1500.24 FT)	DETAILS
			Railway.
November 20, 1906	Clinch River Area		Minor flooding reported. Railroad traffic delayed.
June 14, 1907	Clinch River Valley	1520.5 ft.	Extensive crop damage. Widely remembered flood.
April 3, 1912	Clinch River Area		Minor flooding
April 1, 1913	Clinch River Area		Minor flooding
March 5, 1917	Lower Clinch area		Major flooding in the lower reaches of the Clinch River. Only minor flooding in the upper reaches.
January 29, 1918	Clinch River	1520.1 ft.	Known as the "ice tide" Two to three inches of rain fell on snow covered frozen ground causing major flooding. Schools flooded at Dante
February 3 and June 13, 1923	Clinch River	1517.4 ft.	Two floods caused some damage to the Clinch Valley Division of the Norfolk and Western Railway
December 22, 1926	Clinch River Area	1520.3 ft.	Prolonged period of rain in the lower Clinch Basin. Many washouts occurred on the smaller streams
August 14, 1940	Clinch River Basin	1520.8 ft.	Tropical storm produced two to four inches of rain caused heavy flow in the upper reaches of the river
August 14, 1940	Clinch River Basin	1520.8 ft.	Tropical storm produced two to four inches of rain caused heavy flow in the upper reaches of the river
1940 to 1957	Clinch River Area		Seven minor floods occurred that caused no particular damage
January 30, 1957	Clinch River	1524.4 ft.	Highest known flood of its time. $180,000 flood damages in St. Paul and $60,350 damages in Russell County.
May 7, 1958	Clinch River	1515.8 ft.	Minor flood
March 12, 1963	Clinch River	1522.9 ft.	Over 100 families force to be evacuated in Richlands with two bridges in the Brooklyn area and one in the Hill Creek section were washed away or damages. Two houses in the Doran/Raven area were washed away.
March 17, 1973	Clinch River	1520.2 ft.	No record of flood damage
April , 1977	Clinch River Area	1526.6 ft.	Flood of record. $9.5 million in damages, heavy agricultural damages
January 26, 1978	Clinch River	1521.1 ft.	No record of flood damage
February 16, 2003	Clinch River Area		Rain fall on up to 10" of snow with rising temperatures caused flooding

Recurrence intervals of floods can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gauge at Cleveland and the 1964 TVA Report, there have been 29 recorded events that have exceeded the flood stage on the Clinch in the past 141 years; for a flood recurrence interval of approximately once every 4.7 years. According to the flood profiles included in the FIS, the 100-year flood elevation at the USGS gauge is 1534 (NGVD 29), which corresponds to a flood crest of 33.76 feet, about 5.4 feet higher than the highest recorded flood level.

Levisa Fork and Russell Fork Basin

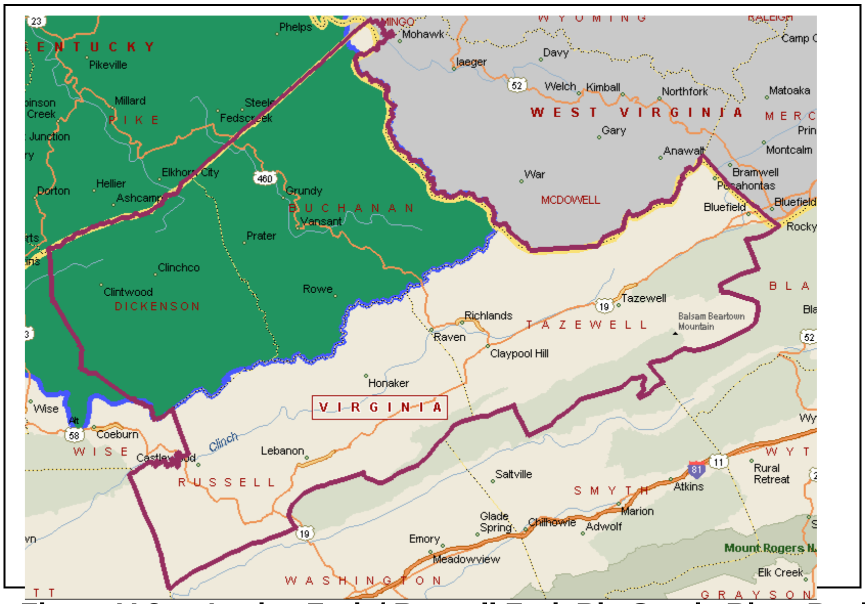


Figure V-3 — Levisa Fork / Russell Fork Big Sandy River Basin

The Levisa Fork and Russell Fork of the Big Sandy River are major rivers located in Buchanan and Dickenson Counties. The Levisa Fork located in Buchanan County, has a drainage area of approximately 300 square miles. The Levisa Fork is fed by numerous tributaries, originating from high mountain ridges throughout the drainage area. The primary tributaries to the Levisa Fork are Slate Creek, Big Prater Creek, Dismal Creek and Garden Creek. Russell Fork, located in Dickenson, is fed by numerous tributaries. The primary tributaries to the Russell Fork are Pound River, McClure River, and Cranes Nest River. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

Records of historic events in the Planning District are numerous; floods on the Levisa Fork and its tributaries have been well documented.

The determined flood stage for the Levisa Fork is 12 feet near Big Rock in Buchanan County. There have been approximately 24 recorded floods since 1929 that have crested above this level on the Levisa Fork. The two largest recorded floods occurred in April, 1977 and January, 1957 with the river cresting at approximately 27.38 at Big Rock and 24.8 feet at Grundy. As for most floods in this area, much information is not available regarding damages due to these events. A Corps of Engineers report produced in 1971 provides information of previous floods and compares all floods to the January 29, 1957 flood. Records from this event indicate that several buildings were inundated with floodwaters, and roadways were blocked. During a Maximum Probable

Flood, the crest would be 19 feet higher than the 1957 flood, velocities in the channel would range up to 22 feet per second and up to 18 feet per second in the flood plain.

Table V-3 includes flood heights for events on the Levisa Fork compiled from a study completed by the Corps of Engineers report of 1971, Virginia State Water Control Board report of 1977, and from USGS gauge data located near Grundy from 1929 to 1967 and from Big Rock from 1968 to present (USGS). The events shown are those with crest levels higher than 12 feet, the flood stage on the Levisa Fork.

Table V-3 — Historical Flooding on Levisa Fork / Russell Fork
Corps of Engineers 1971 and USGS

OCCURANCE	LOCATION	Height at Grundy Gage (Zero = 988.5 FT)	DETAILS
March 1, 1929	Grundy	1005.4 ft.	
February 17, 1944	Grundy	1002.1 ft.	
February 17, 1945	Grundy	1001.4 ft.	
January 7, 1946	Grundy	1003.0 ft.	
May 19, 1953	Grundy	1000.7 ft.	
February 27, 1955	Grundy	1001.1 ft.	
January 29, 1957	Grundy	1010.4 ft	Up to 7' of rainfall. Bridge near power substation washed out taking out power and telephone service to the area. Several homes were washed away on Garden Creek and roads were impassable.
August 25, 1958	Grundy	1003.1 ft.	
March 12, 1963	Grundy	1006.7 ft.	3" to 4" of rainfall in less than 24 hours. Area declared a disaster by the Virginia Governor. Over $41 million damage.
March 7, 1967	Grundy	1005.2 ft.	
April 5, 1977	Grundy		Over 5' of water. Business and homes hard hit $20 million damage.
OCCURANCE	**LOCATION**	**Gage Height at Big Rock (Zero = 866.37 FT)**	**DETAILS**
January 21, 1972	Big Rock	881.8 ft.	
January 11, 1974	Big Rock	882.3 ft.	
March 30, 1975	Big Rock	882.1 ft.	
April 5, 1977	Big Rock	893.8 ft.	
January 26, 1978	Big Rock	883.9 ft.	
May 7, 1984	Big Rock	887.1 ft.	
OCCURANCE	**LOCATION**	**Gage Height at Haysi (Zero = 1237.61 FT)**	**DETAILS**
March 23, 1929	Haysi	1256.11 ft.	
February 3, 1939	Haysi	1254.56 ft.	
February 17, 1944	Haysi	1253.07 ft.	
January 29, 1957	Haysi	1261.32 ft.	$5.5 million damages
March 12, 1963	Haysi	1258.71 ft.	$4.5 million damages
March 7, 1967	Haysi	1257.95 ft.	

Table V-3 — Historical Flooding on Levisa Fork / Russell Fork
Corps of Engineers 1971 and USGS

April 28, 1970	Haysi	1253.32 ft.	
March 16, 1973	Haysi	1254.88 ft.	
January 11, 1974	Haysi	1253.82 ft.	
March 30, 1975	Haysi	1255.64 ft.	
April 5, 1977	Haysi	1265.85 ft.	9' of water in homes and businesses. $8 million damages.
January 6, 1978	Haysi	1256.73 ft.	
May 7, 1984	Haysi	1259.69 ft.	
March 28, 1994	Haysi	1253.86 ft.	
April 17, 1998	Haysi	1254.82 ft.	

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gage at Big Rock and Grundy (The 1971 COR Report), there have been 24 recorded events that have exceeded the flood stage on the Levisa Fork in the past 74 years, for a recurrence interval of approximately once every 2.8 years. According to the flood profiles included in the FIS, the 100 year flood elevation at the USGS gauge is 900.2 (NGVD 29), which corresponds to a flood crest of 33.83 feet, over 6.45 feet higher than the highest recorded flood.

Bluestone River Basin

The Bluestone River is a major river located in the eastern Tazewell County area near Bluefield, with a drainage area of approximately 39.9 square miles. The Bluestone is fed by numerous tributaries, originating from the high mountain ridges throughout the drainage area. The three major tributaries are Wrights Valley Creek, Beaver Pond Creek, and Laurel Fork. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high. The Bluestone River flows into in West Virginia into the New River.

Records of historic events in the Planning District are numerous; floods on the Bluestone and its tributaries have been well documented.

The determined flood stage for the Bluestone is 5.42 feet. There have been approximately 8 recorded floods since 1955 that have crested above this level on the Bluestone. The two largest recorded floods occurred in August, 1964 and January, 1957 with the river cresting over 10 feet near Bluefield. As for most floods in this area, much information is not available regarding damages due to these events. A Virginia State Water Control Board report produced in 1974 provides much information of previous floods. Records from these events indicate that several buildings were inundated with floodwaters, and roadways were blocked.

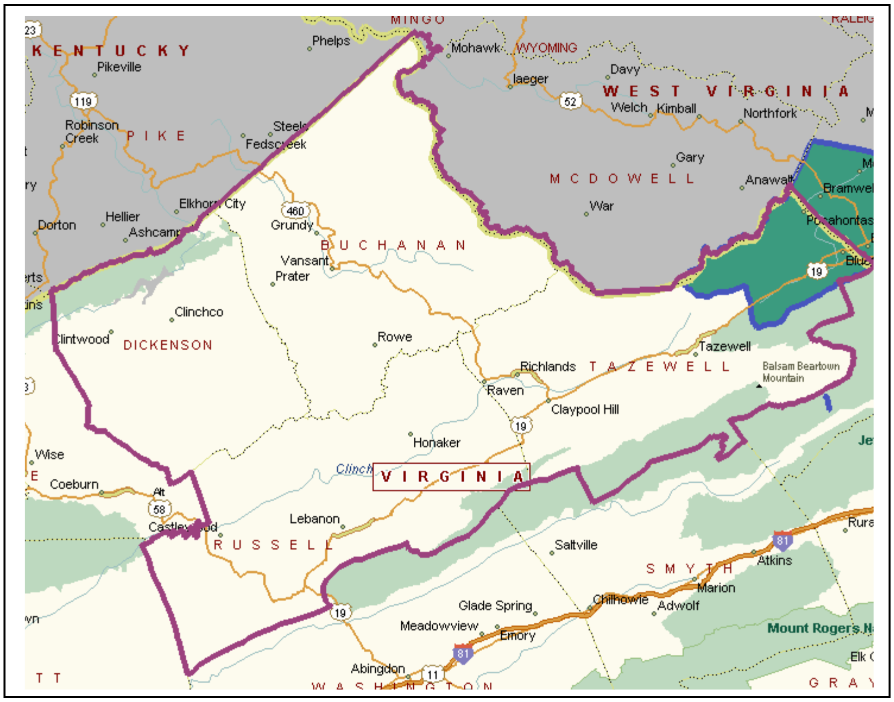


Figure V-4 — Bluestone River Basin

Table V-4 includes flood heights for events on the Bluestone River compiled from a study completed by the Corp of Engineers (State Water Control Board, 1974), and from USGS gauge data (USGS). The events shown are those with crest levels higher than 5.42 feet, the flood stage on the Bluestone. It should be noted that gauge readings prior to 1965, when the gauge was installed at this location, have been estimated from personal accounts, newspaper articles, and high water marks.

Table V-4 — Historical Flooding on the Bluestone River
USGS, 1974

OCCURANCE	LOCATION	Height at Bluefield Gage (Zero = 2350 FT)	DETAILS
March, 1955	Bluefield		4.47" rainfall
January 29, 1957	Bluefield	2360.6 ft.	3.14"' of rainfall. 1,000 person displaced; over $100,000 in damage
March 12, 1963	Bluefield		2.33" rainfall in 24 hours. $7,000 damages to roads
August 28, 1964	Bluefield	2361.4 ft.	2.14" rainfall in 3 hours. $20,000 to $25,000 damages
March 7, 1967	Bluefield	2356.3 ft.	
December 30, 1969	Bluefield	2356.1 ft.	
May 6, 1971	Bluefield	2356.24 ft.	
April1 4, 1972	Bluefield	2357.0 ft.	

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gage near Bluefield, there have been 8 recorded events that have exceeded the flood stage on the Bluestone from 1955 to 1972, for a recurrence interval of approximately once every 2.1 years. According to flood profiles, the 100 year flood elevation at the USGS gauge is 2,356.8 (NGVD 27), which corresponds to a flood crest of 9.58 feet, over 4.6 feet lower than the highest recorded flood.

Hazard Profile

The majority of the flooding in the Cumberland Plateau Planning District is flash flooding that occurs following a period of intense or sustained rainfall. The highly mountainous terrain and associated steep slopes cause rainwater to runoff rapidly, quickly filling streambeds following an event. Flood-producing storms can occur throughout the year; however, historically the most common months for significantly flooding have been January, February, and March. These months, along with April and May, have the highest average precipitation and the highest frequency of intense rain events. In addition, although snowfall amounts in the area are minimal, flood events can be exacerbated by rapidly melting snow during the winter months.

Because of the mountainous terrain of the drainage area, flooding occurs rapidly, often occurring before the rain event has passed, and flow passes very quickly through the smaller tributaries of the area into the larger streams. The combined effect of these smaller tributaries can create extremely fast-moving floodwaters that greatly exceed the capacity of the larger streams. These fast-moving floodwaters allow little time for residents in the floodplain to evacuate themselves or protect their property, and the force of such rapidly flowing waters increase the potential of damage and loss of life. The duration of these flood events vary depending on the specific characteristics of the rain event. Floodwaters generally recede rapidly once the rain event has ended, but can last from a few hours to a few days.

Warning System

Because flash floods occur rapidly and allow very little warning time, the only potential warning to an upcoming flood event comes through the ability to forecast a heavy rain event prior to its occurrence. The National Weather Service (NWS) issues flood watches and warnings when heavy rains or severe storms threaten the area. These warnings are carried to local residents through local media outlets such as television and radio stations. In addition, the NWS, in conjunction with the National Oceanic and Atmospheric Administration (NOAA), operates the NOAA Weather Radio System. This nationwide network of radio transmitters broadcasts severe weather data to relatively inexpensive special receivers that can be purchased by the public. When a severe weather alert is issued, the transmitter will switch to alert mode, notifying residents of the potential risk. Although not extensive, the measures provide residents and citizens located in a flood-prone area some warning time to prepare for a potential flood.

Secondary Effects

If a significant flood event occurs, there is a potential for a variety of secondary impacts. Some of the most common secondary effects of flooding are impacts to infrastructure and utilities such as roadways, water service, and wastewater treatment. Many of the roadways in the Planning District are vulnerable to damage due to floodwaters. The effect of flood damages to roadways can limit access to areas, cutting off some residents from emergency services as well as other essential services.

Since a major heating source in the area is propane gas, many of the properties in the floodplains have above-ground fuel storage tanks. Field observations revealed that the majority of the tanks in the floodplain are not secured or strapped down. If these tanks were to be damaged or dislodged during a flood event, the resulting gas leaks could present serious explosion risks. Tanks can also become floating projectiles in quickly moving floodwaters, causing serious damage to property and danger to individuals in their path.

Hazard Areas

The portions of the Planning District most susceptible to flooding are those directly adjacent to the areas major waterways, however, flooding can occur along the smaller tributaries throughout the area. Due to the mountainous terrain in the area and the associated steep slopes, the majority of development in the Planning District is located in the valleys along these rivers. Development generally consists of residential and agricultural uses, with commercial districts typically limited within the incorporated towns. A significant amount of the development in the Planning District is located in the floodplain.

FEMA, through the National Flood Insurance Program (NFIP), has developed Flood Insurance Rate Maps (FIRMs) that identify flood zones through detailed hydrologic and hydraulic studies. These flood zones represent the areas susceptible to the 1% annual chance flood, or 100-year flood. Whenever possible, FEMA will also determine a Base Flood Elevation (BFE) for the 100-year floodplain, which is the calculated elevation of flooding during this event. The BFE is a commonly used standard level for determining flood risk, and managing potential floodplain development. Although each specific flood event is different, these maps provide a more definitive representation of the highest flood risks in the communities. The specific flood hazard areas in each of the major watersheds are described below.

Clinch River Basin

The sections of the Clinch River area most susceptible to flooding are those directly adjacent to the Clinch River and Little River, however flooding can occur along the smaller tributaries throughout the area. The majority of development is located in the valleys along the Clinch River and Little River and their tributaries. Development in this area consists of residential and agricultural uses. A significant amount of this development is in the Clinch River floodplain.

The Clinch River, and Little River have been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 100 feet wide in some locations to over 1000 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Clinch River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has not been exceeded on the Clinch River. This does not preclude the occurrence of a 100-year event in the future. As stated previously virtually all of the Clinch River watershed located within the CPPDC area is located within Russell County. The effective date for the FIRM in Russell County is March 16, 1988. Watershed changes that have taken place since that date have not been accounted for but should be minimal due to the rural nature of the area.

Levisa Fork and Russell Fork Basin

The sections of the Levisa Fork area most susceptible to flooding are those directly adjacent to the stream and its tributaries. The majority of development is located in the valleys along the Levisa Fork and its tributaries. Development in this area consists of residential and agricultural uses. A significant amount of this development is in the Levisa Fork floodplain.

The Levisa Fork, Slate Creek, Big Prater Creek, Dismal Creek, and Garden Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100 year flood. The 100 year floodplains along these rivers vary from 50 feet wide in some locations to over 500 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Levisa Fork area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has not been exceeded on the Levisa Fork. This does not preclude the occurrence of a 100-year event in the future. The areas of the Levisa Fork and Russell Fork watershed located within the CPPDC area are primarily located within Dickenson and Buchanan Counties. The effective date for the Buchanan County FIRM is August 19, 1997, while the effective date for the Dickenson County FIRM is February 6, 1991. Watershed changes that have taken place since that date have not been accounted for but should be minimal due to the rural nature of the area.

Bluestone River Basin

The sections of the Bluestone River area most susceptible to flooding are those directly adjacent to the Bluestone River, Wrights Valley Creek and Beaver Pond Creek, however flooding can occur along the smaller tributaries throughout the area. The majority of development is located in the valleys along the Bluestone River and its tributaries. Development in this area consists of residential and commercial uses.

The Bluestone River, Wrights Valley Creek and Beaver Pond Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 50 feet wide in some locations to over 600 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Bluestone River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has been exceeded on the Bluestone River. This does not preclude the occurrence of another 100-year event in the future, as history has proven in many other places. A majority of the Bluestone River watershed located within the CPPDC area is located within the Town of Bluefield, while portions are also located in unincorporated areas of Tazewell County. The effective date for the FIRM for the Town of Bluefield is August 2, 1994, while the effective date for the Tazewell County FIRM is March 4, 1991. Watershed changes that have taken place since that date have not been accounted for, but should be minimal due to the rural nature of the area.

Flood Maps

Historically, FEMA FIRMs have only been available as hard copy maps and not in digital format. However, in recent years FEMA has developed digital versions of the FIRMs. The maps have been incorporated into a GIS and can be found at the end of this section.

Vulnerability Analysis

In the previous sections of this analysis, specific areas susceptible to flooding in the Planning District were identified. The next step in a Hazard Identification and Risk Assessment is to identify what is vulnerable to the effects of potential flooding. Flooding impacts a community to the degree it affects the lives of its citizens and the community functions overall. Therefore, the most vulnerable areas of a community will be those most affected by floodwaters in terms of potential loss of life, damages to homes and businesses, and disruption of community services and utilities. For example, an area with a highly developed floodplain is significantly more vulnerable to the impacts of flooding than a rural or undeveloped floodplain where potential floodwaters would have little impact on the community.

A number of factors contribute to the relative vulnerabilities of certain areas in the floodplain. Development, or the presence of people and property in the hazardous areas, is a critical factor in determining vulnerability to flooding. Additional factors that contribute to flood vulnerability range from specific characteristics of the floodplain to characteristics of the structures located within the floodplain. The following is a brief discussion of some of these factors and how they may relate to the area.

- **Flood depth:** The greater the depth of flooding, the higher the potential for significant damages. Flood depths have been estimated for the maximum probable event for this area by various TVA and Corps of Engineers studies. Flood heights and rise rates in Figure V-4 are based on the Maximum Probable Flood.
- **Flood duration:** The longer duration of time that floodwaters are in contact with building components such as structural members, interior finishes, and mechanical equipment, the greater the potential for damage. As stated previously, because of the steep topography of the area, floodwaters tend to recede quickly following and event, but may remain longer in localized areas. Flood durations in Figure V-4 are based on the Maximum Probable Flood.

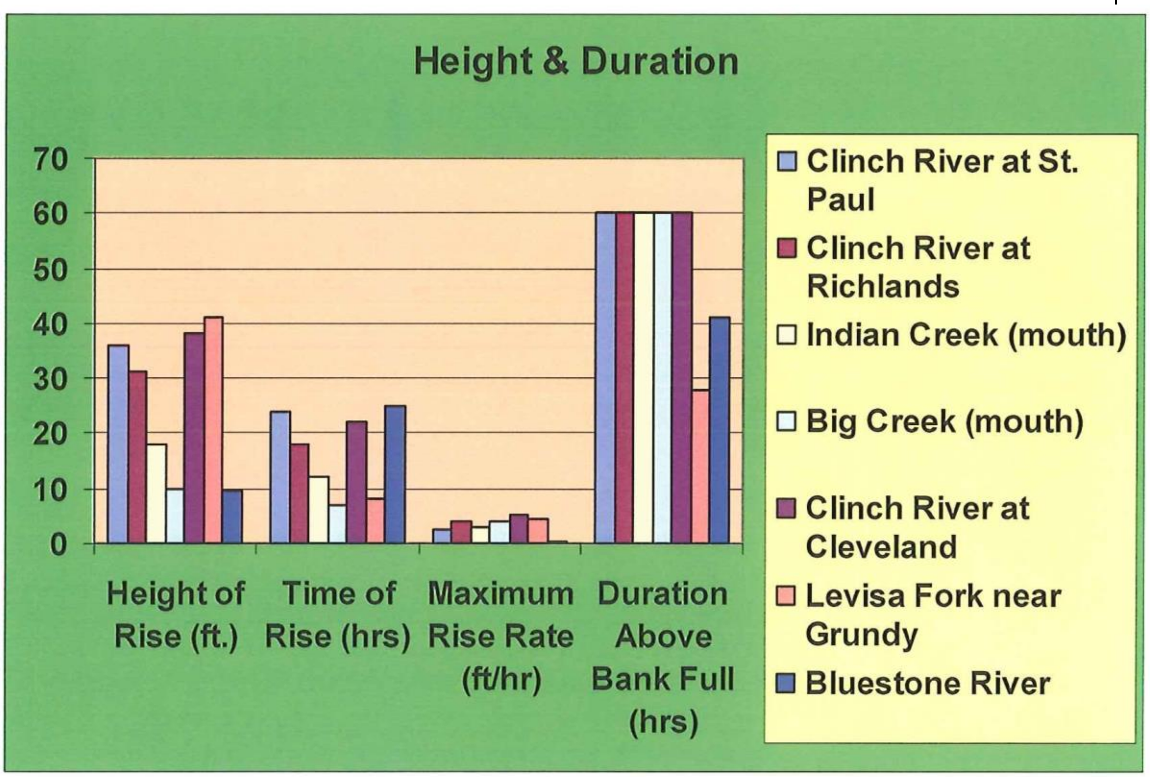


Figure V-4 — River Basin Flood Heights and Duration

- **Velocity:** Flowing water exerts forces on the structural members of a building, increasing the likelihood of significant damage. A one-foot depth of water, flowing at a velocity of 5 feet per second or greater, can knock an adult over and cause significant scour around structures and roadways (FEMA 259). The relatively high velocity of floodwaters in the area will increase damages throughout the Planning District. Flood velocities in Figure V-5 are based on the Maximum Probable Flood.

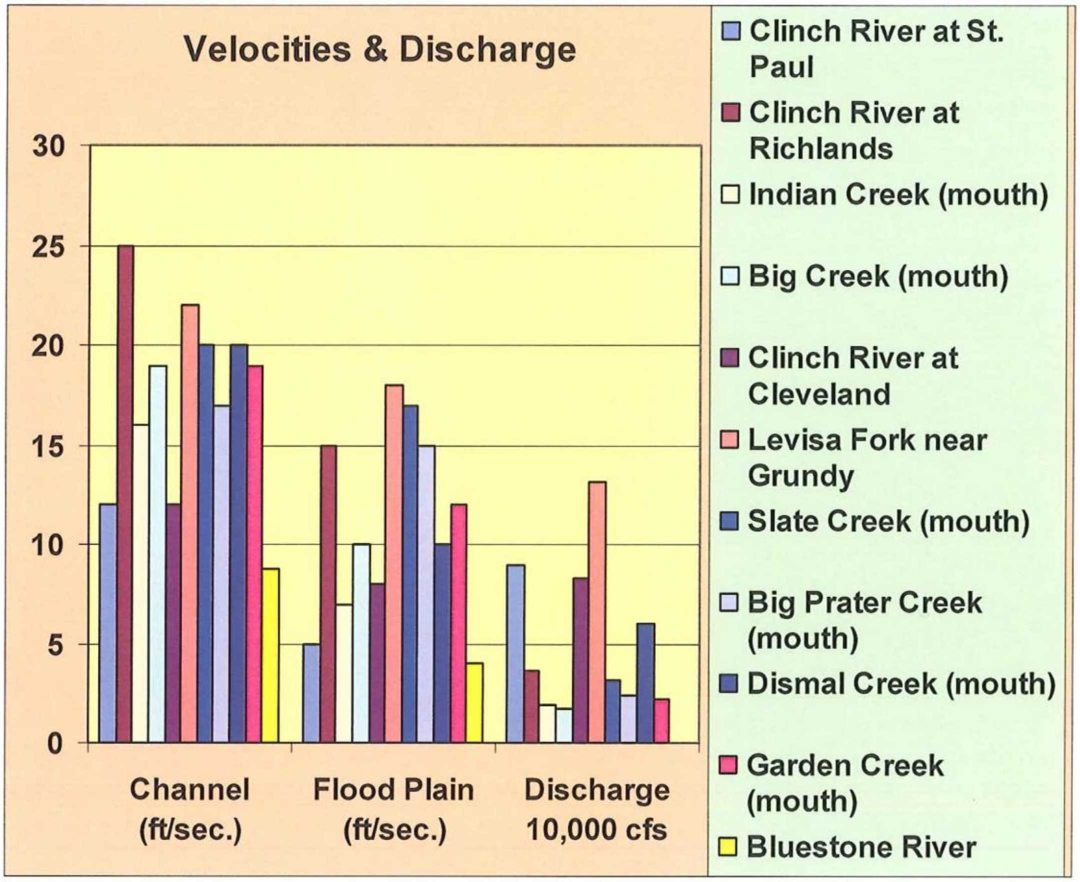


Table V-5 — River Basin Flood Velocities

- **Elevation:** The lowest possible point where floodwaters may enter a structure is the most significant factor contributing to its vulnerability to damage due to flooding. Entry point elevations of structures throughout the Planning District area vary greatly relative to the BFE. Data on the specific elevations of these structures have not been compiled for use in this analysis.

- **Construction Type:** Certain types of construction are more resistant to the effects of floodwaters than others. Masonry buildings, constructed of brick or concrete blocks, are typically the most resistant to flood damages simply because masonry materials can be in contact with limited depths of flooding without sustaining significant damage. Wood frame structures are more susceptible to flood damage because the construction materials used are easily damaged when inundated with water. The type of construction throughout the

Planning District varies from area to area. Specific building types will be discussed in the specific flood area descriptions below.

Structures at Risk

In order to assess the Planning District's potential vulnerability to flooding, specific data regarding structures located in the floodplain was collected as a part of this analysis. Structures potentially in the floodplain were identified by comparing the floodplain areas from the FEMA FIRMs with each County's existing building data. Specific data on these structures was collected during a 'windshield survey' and included the structures' occupancy type, building material type, number of stories, area, value per square foot, total value, and flooding source. Using the type, occupancy, and use of these structures, estimated building values were developed. For the purpose of this analysis, comparable buildings with the same uses, approximate age and general conditions were identified in the Planning District. Tax appraisal values for these buildings (minus land value) and R. S. Means Square Foot Costs were used to develop a square foot value for each building type, which was applied to the properties located in the flood plain to estimate a structure value. Typical per square foot costs for building construction were considered in analyzing the relative accuracy numbers developed for this analysis and some adjustments were made for certain properties in the field based on visual analysis (e.g., decreases in value for blighted or damaged buildings).

Data including the location of existing structures in all four counties located within the Planning District is available in a GIS format, however, detailed data regarding the structures is limited. A vast majority of the existing structures are classified as an unidentified building type. Additional data does vary from county to county but, in general, the location of existing hospitals, police stations, schools, fire stations, and government buildings are known. Therefore using the digital flood data described above, a count of the number of structures located within the floodplain was generated and total value at risk approximated.

From the data collected, a total of 6,045 structures were located in the floodplain, with an estimated total value of over $290 million dollars. This number is based on estimated values for each of the building types described above. Because the structure type for many of the structures is listed as unknown, the cost of the average residential structure was utilized.

Tables V-5 through V-8 include a summary of the number, value, and predominant use of the structures located in the floodplain of all FEMA recognized flood sources. A more detailed discussion of the vulnerability of each flood source follows these tables.

Table V-5: Structures at Risk by Flooding Source Buchanan County		
Flood Source	Number of Structures	Total Value
Big Sandy River	3,219	$150,964,600
Tug Fork	989	$55,051,000

Table V-6: Structures at Risk by Flooding Source		
Flood Source	Number of Structures	Total Value
Big Sandy River	322	$12,979,400

Table V-7: Structures at Risk by Flooding Source Russell County		
Flood Source	Number of Structures	Total Value
Clinch River	691	$31,190,250

Table V-8: Structures at Risk by Flooding Source Tazewell County		
Flood Source	Number of Structures	Total Value
County-wide	824	$40,533,400

The vast majority of structures located in the floodplain of the Cumberland Plateau planning area are residential. The most common type of structure in the flood plain is single-family homes or mobile homes. Mobile homes tend to be more vulnerable than other residential types due to their poor structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

Critical Facilities

The impacts of floodwaters on critical facilities, such as police and fire stations, hospitals, and water or wastewater treatment facilities, can greatly increase the overall effect of a flood event on a community. Some of these facilities in the Planning District are located in areas with a high risk to flooding. As stated previously, the location of some of these types of structures are known throughout the Planning Area. Using this data, a list of these facilities located in the floodplain has been generated, and is included in Table V-9. It should be noted that these facilities have been determined to be in the floodplain using a planning level analysis, and should be used only as a planning tool. In order to accurately determine if a structure is actually located in the floodplain, site-specific information must be available.

Table V-9 — Known Critical Facilities in the Floodplain

Jurisdiction	Type	Facility
Buchanan County	Fire and Rescue	Knox Creek Volunteer Fire
	Fire and Rescue	Grundy Volunteer Fire
	Fire and Rescue	Quality Care Ambulance Service
	Fire and Rescue	Dismal River Volunteer Rescue
	Fire and Rescue	Council Volunteer Fire
	Government Building	Buchanan County Courthouse
	School	Hurley Combined School
	School	Vansant Elementary School
	Hospital	Buchanan General Hospital
Dickenson County	Fire and Rescue	McClure River Volunteer Fire Department
	School	Sandlick Elementary School
	Government Building	Haysi Police Dept / Town Hall
	Fire and Rescue	Haysi Rescue Squad
	Fire and Rescue	Clinchco Fire Department
Russell County	Government Building	Lebanon Town Hall
	Treatment Plant	Central Shop STP
	Treatment Plant	Cleveland STP
	Treatment Plant	Cleveland Water Treatment Plant
	Treatment Plant	Dante Wastewater Treatment Plant
	Treatment Plant	Lebanon Water/Wastewater Plant
	Treatment Plant	Honaker STP
Tazewell County	Police	Richlands Police
	Police / Government Bldg.	Pocahontas Police Dept / Town Offices
	School	Raven Elementary School
	Fire and Rescue	Bandy Fire Department
	Fire and Rescue	Bluefield Fire Department
	Fire and Rescue	Clear Fork Fire Department
	Fire and Rescue	Pocahontas Fire Department
	School	North Tazewell Elementary
	School	Tazewell Elementary
	School	Tazewell Middle School
	School	Tazewell High School
	Treatment Plant	Bluefield Water Treatment Plant
	Treatment Plant	Bluefield Wastewater Treatment Plant
	Treatment Plant	Falls Mills Wastewater Treatment Plant
	Treatment Plant	Richlands Water Treatment Plant
	Treatment Plant	Richlands Wastewater Treatment Plant
	Treatment Plant	Pocahontas Water Treatment Plant
	Treatment Plant	Tazewell Wastewater Treatment Plant
	Treatment Plant	Wardell Wastewater Treatment Plant
	Treatment Plant	Misc. Wastewater Lift Stations
	Community Services	AASC Adult Day Care – Falls Mills
	Community Services	Clinch Valley Community Action
	Electrical Infrastructure	AEP Power Substations
	Communications	Verizon Phone Services
	Communications	Sunset Digital Fiber Optic Systems
	Community Access	Bridge – Sage Hill Road
	Community Access	Bridge- Mountain Road
	Community Access	Bridge – Fincastle Farms Road

Special needs populations are those that require additional attention during a flood event, are not as able to protect themselves prior to an event, or are not able to understand potential risks. These can include non-English populations, elderly populations, or those in a lower socioeconomic group. Special needs populations in the Planning District area are primarily lower income and elderly individuals, living in a flood-prone area, without the resources to take actions to protect themselves.

Future Land Use Trends

Due to existing development and very steep topography outside of the river valleys, developable land in the Planning District is scarce. For that reason, one of the dominant development trends in the area is redevelopment. Older, lower value structures are being destroyed and replaced by newer construction with significantly higher dollar values. This is especially true with older mobile homes that are being replaced by new pre-fabricated modular homes. Many of these structures are located in the floodplain, where this redevelopment trend is increasing the value of structures at risk to damages due to flooding in the Planning District.

A complete list of events from 2012-partial 2018 can be found at the end of this document.

Winter Storms

Severe winter storms and blizzards are extra-tropical cyclones that originate as mid-latitude depressions (FEMA, 1997). Snowstorms, blizzards, and ice storms are the most common examples. These storms can bring heavy snowfall, high winds, ice, and extreme cold with them. Historically, winter storms in Southwest Virginia have produced significant amounts of snowfall, sleet, and freezing rain.

Recent Snowstorm History

Between January 20 and 22, 1985, an arctic cold front swept across the state, ushering in extreme cold and high winds. Wind chill temperatures plunged well below zero. Winds knocked out power compounding the effects of the cold. Pipes froze and burst. Fresh snowfall of 4 inches helped temperatures across the entire state fall below zero. New records were set at several locations in the state.

During the winter of 1993-1994, Virginia was struck by a series of ice storms. Although ice storms are not an uncommon event in the valleys and foothills of the Appalachian Mountains, and the region had been overdue for an ice storm, it was unprecedented to have several occur in succession.

The most significant winter storm to affect the Cumberland Plateau Planning District was the "Super Storm of March '93", also known as "The Storm of the Century". Occurring between March 12 and 15, 1993, this storm affected 26 states throughout the central and eastern portions of the United States. The storm resulted in a Federal disaster declaration. Throughout the region, the snowfall amounts ranged from 12 inches to over 48 inches depending on elevation. Extreme southwest Virginia saw 30 to 42 inches of snow from the storm (the most snow in more than 25 years). Some roofs collapsed under the weight of the snow. Winds produced blizzard conditions over portions of the west with snow drifts up to 12 feet. Interstates were shut down. Shelters were opened for nearly 4,000 stranded travelers, and those that left were without heat and electricity. Virginia called out its National Guard to help with emergency transports and critical snow removal.

During the February 10 and 11, 1994 ice storm, some areas of southern Virginia received a devastating 3 inches of ice, causing tremendous tree damage and power outages for up to a week. The "Blizzard of '96" or the "Great Furlough Storm" began late on Saturday, January 6. As much as 30 to 36 inches of snow fell over the western mountains.

On December 18, 2009 the area was hit by a heavy snowstorm that moved out of the eastern Gulf of Mexico. The heavy snow event was declared a state of emergency by Governor Kain. Multiple homes were damaged and electricity was out for many days. In some locations the snow was above 2 feet.

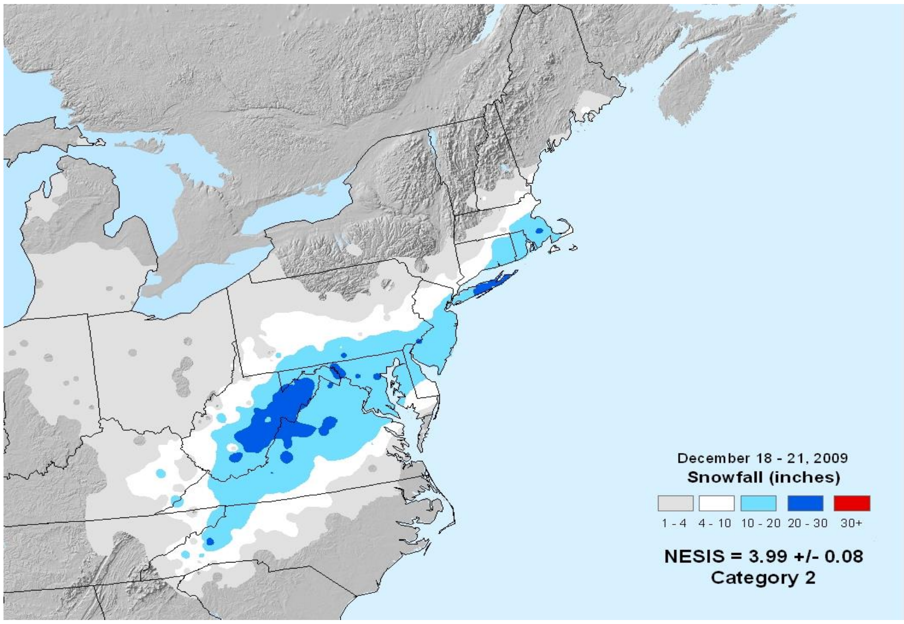


Figure V-6 — Snowfall Totals from 2009 Blizzard

Table V-10 includes ranges of snowfall for select historic events in Southwest Virginia. This table is not inclusive of all historic snowfall events.

Table V-10 — Historic Snow Fall Amounts	
Date	**Amount**
February 12 -March 10, 1960	65 inches
December 10 - 12, 1960	4 - 13 inches
January 20 - 22, 1985	4 inches
March 13-14, 1993	30 - 42 inches
January 6-13, 1996	30 - 36 inches
January 27-28, 1998	12 - 24 inches
December 18-21 , 2009	10-20 inches
February 16-17, 2015	10-12 inches
December 9-10, 2018	10-24 inches

Hazard Profile

Although the Commonwealth of Virginia is not generally associated with severe winter storms, the mountainous area in the southwestern portion of the state regularly experiences several snow storms each year. These storms can produce between 4 and 12 inches of snow from each event. Total average annual snowfall within the Planning District varies from county to county. Buchanan County has an average annual snowfall of 23" per year, Dickenson County is 15" per year, Russell County 21" per year, and Tazewell County 40" per year as illustrated in Figure V-7. However, as Table V-10 illustrates, storms producing higher snowfall amounts are possible.

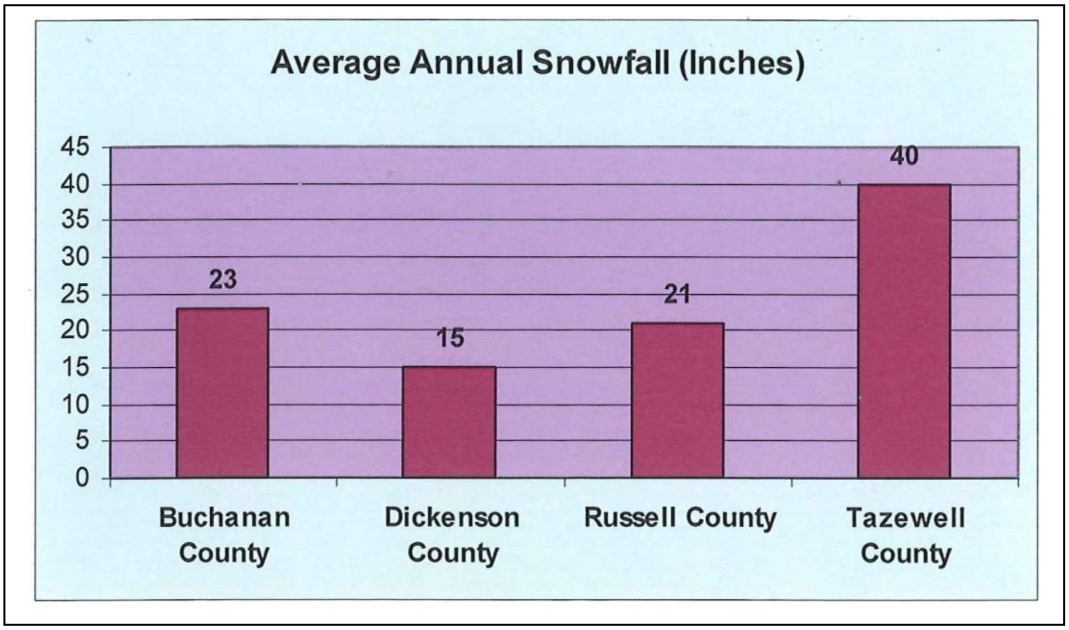


Figure V-7 — Average Annual Snowfalls

In addition to snow, winter storms can also bring sleet and freezing rain to the area. Sleet is generally described as frozen water particles that fall in the form of ice, while freezing rain falls as super cooled water which can freeze on impact with the ground, trees, or roadways. In its most severe form, freezing rain can fall as part of an ice storm that can coat the area with a layer of ice up to 3" thick. Ice storms can cause significant damage by snapping tree limbs and bending trees to the ground. These fallen limbs and trees can completely block roadways, cut access to certain areas of the Planning District for days, and interfere with and destroy overhead utility lines.

Predictability and Frequency

The National Weather Service tracks winter storms by radar. Based on this radar information as well as models, the National Weather Service provides up-to-date weather information and issues winter storm watches to indicate when conditions are favorable for a winter storm, and winter storm warnings if a storm is actually occurring or detected by radar. On average, southwestern Virginia will experience between one and two severe winter storms in a given year. Snowfalls amounts for these storms can vary from a few inches to up to a foot of snow in extreme cases. The higher elevations of the Planning District can experience several feet of snow in a severe winter storm.

Vulnerability Analysis

Winter storms can disrupt lives for periods of a few hours or up to several days, depending upon the severity of the storm. Transportation systems are usually among the first and hardest hit sectors of a community. Snow and ice can block primary and secondary roads, and treacherous conditions make driving difficult; some motorists may be stranded during a storm, and emergency vehicles may not be able to access all areas. The steep slopes found throughout the Planning District exacerbate the situation, making some of the secondary roads impassible during even a minor winter weather event.

Utility infrastructure also can be adversely affected by winter storms. Heavy snow and ice can cause power lines to snap, leaving citizens without power and, in some cases, heat for hours or even days. Likewise, telephone lines can also snap, disabling communication within portions of a community. Frozen water pipes can rupture in people's homes, and water and sewer mains can also freeze and leak or rupture if not properly maintained. These ruptures can lead to flooding and property damage.

People's health can also be adversely affected by severe winter weather. People who lose heat in their homes and do not seek alternate shelter, people who get stuck in snowdrifts while driving, or people working and playing outdoors can suffer from hypothermia and frostbite. Since winter weather hazards generally affect the entire Planning District and vary in intensity and form, it is not possible to quantify primary effects or specific damages.

Secondary effects

Secondary effects of winter storms are broad. Treacherous driving conditions can result in automobile accidents in which passengers may be injured and property damages may occur. Deliveries of heating fuel can be delayed by impassible roads. Impassable roads also can result in schools being closed because buses are not able to access their routes and bring children to school. The costs of salting and sanding roads and of snow removal can be staggering to communities both large and small. The costs to repair roads after spring thaws also can be significant.

After a significant snowfall, the resulting thaw that occurs when the temperature rises above freezing can cause flooding in some areas. As noted in the flood portion of this document, January through March are the months with the highest occurrences of flooding. The rainy season coincides with snowfall and subsequent melting. Because of the mountainous terrain in this area, flood events tend to occur rapidly and with little warning.

The local economy can also suffer if businesses close due to inclement winter weather. The impact could be significant in a larger event. In addition, disabled transportation systems may mean that shipments of goods and services are delayed, which may result in decreased inventory for retailers and increased inventory for industrial and commercial suppliers.

A complete list of events from 2011-2018 can be found at the end of this document.

Wildfire

"A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures" (FEMA 386-2, 2001) and may originate from a variety of ignition sources. The risk of wildfires, though not as high as it is in the western U.S., is a genuine concern for the Commonwealth of Virginia. Each year, about 1,600 wildfires consume a total of 8,000 to 10,000 acres of forest and grassland in the Commonwealth. During the fall drought of 2001, Virginia lost more than 13,000 acres to wildfires (Virginia Department of Forestry website)

Hazard History

Most of Virginia's wildfires were caused either intentionally or unintentionally by humans. Due to the growth of the population of the Commonwealth, there has been an increase in people living in the urban-wildland interface, as well as an increase in use of the forest for recreational purposes. Historical records of wildfire events specific to the Cumberland Plateau Planning District are limited, and not all wildfires are reported. Based on the data obtained from the VDOF WRA, between 1995 and 2008 there have been over of 973 wildfire incidents in the Cumberland Plateau Planning District. These incidents are shown graphically on a map prepared by VDOF, *"Cumberland Plateau, Wildfire Incidents From 1995 to 2008",* included at the end of this section. As shown on the map, there have been a higher number of incidents in the northwestern portion of the planning district. The numbers of incidents, per county per year, are listed in Table V-11.

Table V-11 — Wildfire Incidents per year per County					
Fire Year	County				Total
	Buchanan	Dickenson	Russell	Tazewell	
1995	43	20	18	No data	81
1996	22	10	10	14	56
1997	20	11	9	10	50
1998	23	9	12	17	61
1999	40	16	21	14	91
2000	37	26	24	17	104
2001	71	20	19	17	127
2002	15	12	18	14	59
2003	24	7	7	6	44
2004	19	8	16	6	49
2005	12	13	10	7	42
2006	26	13	20	6	65
2007	32	20	16	9	77
2008	25	15	18	9	67
Total	409	200	218	146	973

Buchanan County

Based on the 1995 to 2008 recorded data in Table V-11, there were 409 wildfire incidents, which have burned more than 18,140 acres and caused an estimated amount of $15,224,440 worth of damage. Of these incidents, only eight (9) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (121 fires) and other incendiary causes (279 fires).

Dickenson County

Between 1995 and 2008, there have been 200 recorded incidences of wildfire, which have burned more than 3,046 acres and caused an estimated amount of $2,080,082 worth of damage. Of these incidents, only one (3) is known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (47 fires) and other incendiary causes (150 fires).

Russell County

Between 1995 and 2008, there have been 218 recorded incidences of wildfire, which have burned more than 2,221 acres and caused an estimated amount of $1,335,550 worth of damage. Of these incidents, only three (3) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (71fires) and other incendiary causes (144 fires).

Tazewell County

Between 1995 and 2008, there have been 146 recorded incidences of wildfire, which have burned more than 1,382 acres and caused an estimated amount of $378,709 worth of damage. Of these incidents, none are known to have been caused naturally. They have been caused by human activities such as debris burning (71fires) and other incendiary causes (75 fires).

Hazard Profile

Wildfires can be classified as either a wildland fire or an urban-wildland interface (UWI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. An urban-wildland interface fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In UWI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the urban-wildland interface is defined as "...the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildlands or vegetative fuels."

A wildfire hazard profile is necessary to assess the probability of risk for specific areas. Certain conditions must be present for a wildfire hazard to occur. A large source of fuel must be present; the weather must be conducive (generally hot, dry, and windy); and fire suppression sources must not be able to easily suppress and control the fire. Once a fire starts, topography, fuel, and weather are the principal factors that influence wildfire behavior. There are several factors that influence an area's risk to the occurrence of wildfires. These include, but are not limited to:

- Historical Wildfire Data
- Land Cover

- Percent Slope of Topography
- Slope Orientation
- Population Density
- Distance to Roads
- Railroad Buffer
- Road Density and Developed Areas

Historical Wildfire Data - It is generally accepted that areas where wildfires have historically been relatively prevalent (or absent) will remain similar in the future. As stated above, there are numerous portions of the Cumberland Plateau Planning District that have high numbers of historic wildfires. Therefore, it can be assumed that the conditions that contribute to a wildfire occurrence are present in these areas, increasing the likelihood that additional fires will occur in these areas.

Land Cover - Wildfire fuels (e.g., grasses, crops, forest, and urban development) determine the ease of ignition, as well as the burn intensity and advancement opportunities. Because of the rural nature of the Cumberland Plateau Planning District, a large portion of the area is forested. These forested areas serve as a readily available fuel source, which also increases the risk of wildfire incidents and of widespread and larger events.

Percent Slope of Topography - Through convective pre-heating, wildfires generally advance uphill. In general, the steeper the slope, the greater the ease of wildfire ignition. The mountainous terrain (i.e., steep slopes) of the planning district is conducive to the ignition and advancement of wildfires. In addition, the steep slopes are a detriment to fire fighting efforts because of the difficulty in accessing and transporting firefighting equipment to wildfire sites.

Slope Orientation - Slopes that generally face south receive more direct sunlight, thereby drying fuels and creating conditions more conducive to wildfire ignition. There are numerous south-facing slopes in the planning district, creating a greater potential for wildfire occurrence.

Population Density - An overwhelming majority of wildfires in the Commonwealth are intentionally or unintentionally ignited by humans. As population increases, the more opportunities for wildfire ignition exist. Therefore, although large portions of the Cumberland Plateau Planning District posses many of the other factors that contribute to the occurrence of wildfires, the rural characteristic of these areas decrease the risk of potential wildfires.

Distance to Roads - Travel corridors increase the probability of human presence, which in turn can result in increased potential for wildfire ignition. Hence, areas of the planning district that are in close proximity to roadways have a higher probability of wildfire. Approximately 21% of the fires reported in the planning district were caused by people in cars.

Railroad Buffer - Railroad operations can produce sparks that may ignite a wildfire. Numerous railroads run through the Cumberland Plateau Planning District; however, this risk is low, with only about 1.5% of wildfires occurring in the planning district having been reported as ignited from railroad use.

Road Density and Developed Areas - Areas that contain a large percentage of developed land and roadway networks generally feature low amounts of wildland fuels, which are typically fragmented to such a degree to minimize the risk of a wildfire. This is the case in many of the towns and villages throughout the Cumberland Plateau Planning District, thereby lowering the overall risk to the most densely populated portions of the area.

Fire Seasons

The Virginia wildfire season is normally in the spring (March and April) and then again in the fall (October and November). During these months, the relative humidity is usually lower and the winds tend to be higher. In addition, the hardwood leaves are on the ground, providing more fuel and allowing the sunlight to directly reach the forest floor, warming and drying the surface fuels.

As fire activity fluctuates during the year from month to month, it also varies from year to year. Historically extended periods of drought and hot weather can increase the risk of wildfire. Some years with adequate rain and snowfall amounts keep fire occurrences low; while other years with extended periods of warm, dry, windy, days exhibit increased fire activity.

Long-term climate trends as well as short term weather patterns play a major role in the risk of wildfires occurring (as shown in Table 5.1 for the years 2000 and 2001.) For instance, short term heat waves along with periods of low humidity can also increase the risk of fire, while high winds directed at a fire can cause it to spread rapidly.

Secondary Effects

There are numerous secondary effects that could impact the Cumberland Plateau Planning District due to wildfires. These include a negative impact on tourism, and thus the local economy, through activities such as camping, hiking, hunting, and fishing. Additional secondary impacts due to wildfire include a degradation of air and water quality, as well as a threat to wildlife habitat including endangered species. Also, areas that have been burned due to wildfire have an increased risk of flooding and landslides in the event of heavy rains.

Hazard Areas

VDOF used GIS to develop a statewide spatial Wildfire Risk Assessment model to identify areas where conditions are more conducive and favorable to wildfire occurrence and advancement. This model incorporated the factors listed in the Hazard Profile section and weighted them on the scale of 0 to 10, with 10 representing the characteristic of each factor that has the highest wildfire risk. With this model VDOF identified areas of the Cumberland Plateau Planning District as having a wildfire risk level of High, Medium, or Low. The results are shown on the map prepared by VDOF, *"Cumberland Plateau, Virginia Fire Risk Zones",* included at the end of this section. As indicated on the map, only a small area within Russell and Tazewell Counties has a low fire risk zone. The Cumberland Plateau Planning District is mostly a high risk area. This high risk is most likely due to the topography (steep slopes) and the inaccessibility of the area, particularly in Buchanan and Dickenson Counties.

Vulnerability Analysis

As stated in the section above, according the VDOF Wildfire Risk Assessment large portions of the Cumberland Plateau Planning District are at high risk for wildfire occurrence. Although these high risk areas tend to be located in the more rural and mountainous portions of the planning district, higher density areas have also been classified as having a high risk. Because these high risk areas are so vast, many of the residents of the planning area live or work in or near a high risk area. Therefore, the most significant threat to the Cumberland Plateau Planning District is that to human life and safety. Many residents in the area live within the urban-wildlife interface and are at the greatest risk from potential wildfires. A commonly found scenario in the Cumberland Plateau Planning District is the 'stacking' of structures up a ridge with one-way access and flammable fuels in between the structures. These circumstances can greatly increase the risk of loss from wildfire and is hazardous to firefighters trying to protect the structures.

Structures at Risk

As stated in the previous section, large portions of the Cumberland Plateau Planning District have been designated as having a high risk to wildfires as determined by VDOF. In an attempt to quantify the potential vulnerability in the areas, the approximate number structures located in these areas have been estimated. As mentioned in earlier sections of this report, the counties included in the CPPDC have a comprehensive GIS system which includes an inventory of building locations and building type. With this data available, and because the VDOF Risk Assessment is also readily available in GIS format, determining the number of structures located in each Risk Wildfire zone was relatively simple. Table V-12 below includes the results of this analysis.

Table V-12 — Structures in Wildfire Risk

Jurisdiction	High Risk	Medium Risk Zone	Low Risk Zone	Percent Structures in High Risk Zone
Buchanan	22,903	660	484	95%
Dickenson	16,999	1,575	45	91%
Tazewell	27,268	13,113	865	66%
Russell	19,556	14,888	317	56%

A complete list of events from 2011-2018 can be found at the end of this document.

Landslides

A landslide is an occurrence of ground movement in which soil, rock, or debris move outward and downward along a slope. Types of landslides can include rock falls, deep-seated failures of slopes, shallow debris slides, and mudslides. The difference in these types of slides depends on the type of movement, as well as the type of material. Landslides can occur suddenly and dramatically or can occur slowly over a period of time. The exact location and timing of a landslide cannot be predicted. Landslides are common throughout the Appalachian Mountain region because of the extremely steep slopes present in the area.

Hazard History

Historically, numerous landslides have occurred throughout the Cumberland Planning District. In some cases, slide locations are still visibly apparent, however, detailed historic records of the location and extent of landslides have not been kept. Because a majority of landslide occurrences have occurred adjacent to existing roadways, or around a roadway under construction, the best resource for obtaining landslide data are the local offices of the Virginia Department of Transportation (VDOT). Therefore, VDOT representatives were specifically contacted in an attempt to gather as much information on historic landslides as possible. The following section includes a description of the landslide data by county.

Buchanan County

VDOT reported six individual locations throughout Buchanan County where historic landslide activity has been documented. The reported landslides documented by VDOT occur at various locations in the county. These locations include:

- Route 672, along Copperhead Branch in the southern portion of the county
- Route 83 at Lover's Gap
- Route 648 and 460 at Dismal Creek
- Route 700 at Big Rock
- Route 643 in the northern portion of the county at Guesses Fork
- Route 697 north of Kelsa

These location can also be found on the *"Buchanan County, Virginia Landslide Locations"* map, included at the end of this section.

Dickenson County

In Dickenson County, VDOT has documented historic landslides occurring at 27 different locations throughout the County. These locations can also be found on the *"Dickenson County, Virginia Landslide Locations"* map included at the end of this section.

Russell County

VDOT has identified seven primary landslide locations throughout Russell County, a majority of which are located along major roadways throughout the county. In addition to the location of the slides, VDOT also provided additional data regarding the characteristics of some of the historic slides.

- Route 63 between Sun and Dante. Fairly stable. Monitoring for movement.
- Route 58 across from Route 71 in western portion of county.
- Route 19 near Washington County line. Southbound lane settles periodically.
- Route 19. Northbound exit ramp at Coal Tipple Hollow. Periodic cleanup and monitoring.
- Route 19. Huffman Hill. Has been stable for some time.
- Route 19 near Souls Harbor Church.
- Route 80 at Doubles Branch.
- Route 80 on Big A Mountain.
- Route 71 below Lebanon Town limits

These locations can also be found on the *"Russell County, Virginia Landslide Locations"* map included at the end of this section.

Tazewell County

In Tazewell County, VDOT has documented historic landslides occurring at 14 different locations throughout the County a majority of which are located along major roadways throughout the county. These include:

- Route 19 at several locations.
- Route 460 in the city of Cedar Bluff.
- Several locations along roadways in the Jefferson National Forest.
- Route 637 at The Jumps and the intersection with Route 626.

These locations, as well as the others can also be found on the *"Tazewell County, Virginia* Landslide *Locations"* map included at the end of this section.

It should be noted that this locations do not represent all of the historic slide locations in the Cumberland Plateau Planning District. Many small landslides that do not directly impact the public are not reported or recorded. These landslides have typically been located along smaller roadways throughout the area, and numbers of slides and potential damage amounts are unknown.

Hazard Profile

Where and when landslides occur is based on number of natural factors but can be exacerbated by conditions created by man. The most prominent natural factors affecting susceptibility to landslides are topography, geology, and precipitation. No single factor alone will cause a landslide to occur, but a combination of factors will. Topography plays an obvious role in the occurrence of landslides. The steeper a slope, the greater the forces of gravity that are acting on the rocks or soils on that slope, which increase the potential for failure. Geology is an important factor as well, as the strength of the rock, soil, or debris to resist the forces of gravity greatly affects the likelihood of a landslide. Therefore, the type and sequence of rock and soil types and layers greatly affect slope stability. The potential for landslides on slopes with the combination of steep terrain and loose or weak soil can be exacerbated by high levels of precipitation. Precipitation is a key catalyst for the occurrence of a landslide. Water can seep into the voids between soil and rock particles, decreasing the strength of the slope, and increasing the potential for landslides. As a result, landslides are most common during or following heavy periods or rain.

Other factors that increase the potential of a landslide include erosion, undercutting, and slope loading. When the base of a slope is eroded or undercut, the strength of the entire slope can be compromised. In mountainous regions such as the Cumberland Planning District, this commonly occurs along existing roadways, or during the construction of new roadways. Slope loading can also increase the potential for landslides. The construction of structures or roadways on a steep slope can increase the strain on the material, thus increasing the potential of a slide. The amount of ground cover and vegetation on a slope also can play a role in a slopes susceptibility to landslides, as dense cover can secure an otherwise unstable slope.

Landslides can be triggered by other natural hazards. The effect of extreme precipitation including flooding has been discussed above. In addition, ground shaking associated with an earthquake can trigger landslides on unstable slopes. Thin surface soils and steep topography throughout the Cumberland Planning District create conditions favorable to erosion and landslides. Widespread construction of roads, clearing of lands, and preparation of development sites on very steep slopes exacerbate the problem.

Predictability

The exact time or location that a landslide will occur cannot be predicted. As previously discussed, landslides can be caused by a combination of many different factors. In some instances, the potential for a landslide to occur at a particular location can be identified based not only on topographical and geologic factors, but also on other physical indicators. The United States Geological Survey (USGS) has developed a landslide overview map for the United States that combines susceptibility to landslides as well as the history of past landslide incidences in the area. The map ranks the susceptibility of and area and the past incidence on a level of high, moderate, and low. A level of high incidence was given to areas where more than 15% of the land had been involved in land sliding, and a level of high susceptibility was given to areas where more than 15% of the land area was determined to be susceptible to landslides based on geologic and topographic factors. Virtually the entire Cumberland Plateau Planning District is located within an area of both high susceptibility and high incidence, indicating the highest possible national risk level.

Hazard Areas

Because of the physical characteristics of the area, virtually the entire Cumberland Plateau Planning District is located in an area that has a high risk to the effects of landslides. As stated previously, due to the many factors that contribute to when and where a landslide will occur, it is extremely difficult to indicate precise locations that are at a greater risk of being affected by a landslide than other areas. However, one of the best indicators of where a landslide may occur is the locations of past landslide activity. These areas have demonstrated susceptibility to landslide occurrence, making additional landslides at these locations likely.

Historic landslide problem areas are indicated in the landslide location maps included at the end of this section. As noted previously, these maps do not depict all areas within the planning district where historic landslides have occurred, or where they may be a problem in the future. Historically, detailed records have not been maintained by local or county governments, therefore the data required to identify all known high landslide risk areas located within the planning district is not available.

Vulnerability Assessment

Because the conditions that cause a landslide are extremely site specific, the impacts of an individual landslide can vary greatly. Landslides can damage or potentially destroy anything in the path of the slide including homes, businesses, roads, and utilities. Landslide debris can also partially or fully block rivers, in which case the potential for significant flooding exists. The precise impacts of a landslide will depend on the specific characteristics of the slide, as well as the level of development in the slide area.

Due to the extreme steep slopes throughout the Cumberland Plateau Planning District, virtually all of the development in the area is at high risk to the effects of landslides. The vulnerability of specific structures and assets can only be determined by a detailed investigation of the site characteristics, primarily the proximity to at-risk slopes. A majority of the more densely developed areas of the planning district are located in areas with more gradual slopes. Therefore, the risk of widespread damages due to landslides in the densely developed areas is limited. However, a majority of the unincorporated areas throughout the planning district have extremely steep slopes. The potential for landslide damage to structures in these areas could be high.

Based on past occurrences, the most vulnerable assets located within the Cumberland Plateau Planning District are its roadways. Many of the roads in the area traverse steep slopes increasing the vulnerability to damage. The damage to a roadway affected by a landslide can vary from partial blockage to total destruction. In addition to the damage to the road itself, more significant economic and safety impacts may be felt by the community due the loss of function of the roadway. Many of the roadways throughout the planning district provide the only direct access from one community to another, or potentially the only access certain remote areas. This reduction in access can increase the response time of emergency vehicles, creating a potentially serious threat to public safety in these areas.

A complete list of events from 2011-2018 can be found at the end of this document.

Wind Events

Wind can be one of the most destructive forces of nature. Strong winds can erode mountains and shorelines, topple trees and buildings, and destroy a community's critical utilities and infrastructure. Primarily, damaging winds that affect the Cumberland Plateau Planning District are associated with severe thunderstorms, or the remnants of a tropical storm or hurricane. Winds from a severe thunderstorm can reach over 60 mph in the southwest Virginia region. These storms generally develop along a cold front and can extend for hundreds of miles.

Although rare, tornadoes can occur in the Planning District. If a tornado were to impact the Planning District, the level of damages sustained would depend most on the strength of the tornado, measured by the Fujita Scale, along with the type and number of facilities and resources impacted. Table V-13 includes the corresponding wind speeds for the Fujita Scale, and typical damage descriptions for each level.

FUJITA SCALE			DERIVED EF SCALE		**OPERATIONAL EF SCALE**	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	**EF Number**	**3 Second Gust (mph)**
0	40-72	45-78	0	65-85	**0**	**65-85**
1	73-112	79-117	1	86-109	**1**	**86-110**
2	113-157	118-161	2	110-137	**2**	**111-135**
3	158-207	162-209	3	138-167	**3**	**136-165**
4	208-260	210-261	4	168-199	**4**	**166-200**
5	261-318	262-317	5	200-234	**5**	**Over 200**

Hazard History

Records of the impacts of high wind events in the Cumberland Plateau Planning District are limited. The relatively large distance between the Planning District and the Atlantic Coast limit the impacts of the winds associated with hurricanes and tropical storms. Because the highest winds speeds associated with a hurricane or tropical storm are typically located to the east of the storm's eye, and the path of most of these storms are to the east of the Planning District, extremely high winds from these events are rare. Damaging winds from severe thunderstorms have occurred throughout Southwest Virginia on a regular basis. Wind damages have typically been localized throughout the region and have included broken tree limbs, blown down trees, damage to power lines, and moderate building damage.

Due to the mountainous terrain, tornado occurrences in the area have been rare, although they are possible. Table V-14 includes historical tornado occurrences in the counties within the Planning District.

Table V-14 — Tornadoes from 1950-2011	
County	**# of Tornadoes**
Buchanan	**1**
Dickenson	**2**
Russell	**6**
Tazewell	**2**

Wind Zones

The Planning District is not classified as an area with a higher than average base wind speed nationally. According to the Virginia Uniform Statewide Building Code (BOCA, 1996), the minimum design wind speed for the Planning District area is 70 mph.

High wind events, primarily severe thunderstorms, have occurred in every portion of the Planning District. There are no proven indicators to predict specifically where high winds may occur, and these events can be expansive enough to affect the entire area. Although localized geography, such as mountain ranges and gorges, can contribute to potential damages caused by these events, no specific locations within the Planning District have been identified due to these conditions. Therefore, the entire Planning District is considered to have an equal risk of being impacted by a high wind event.

Vulnerability Analysis

Depending on the type of wind event, the damage sustained can range from extremely localized to widespread, and from moderate to devastating. The potential impacts of a severe wind event to the Planning District depend on the specific characteristics of the event but can include broken tree branches and uprooted trees; snapped power, cable, and telephone lines; damaged radio, television, and communication towers; damaged and torn off roofs; blown out walls and garage doors; overturned vehicles; totally destroyed homes and businesses; and serious injury and loss of life. Downed trees and power lines can fall across roadways and block key access routes, as well as cause extended power outages to portions of the Planning District.

The extent and degree of damages from a high wind event are primarily related to the intensity of the event, measured in terms of wind speed. Sustained high winds can be the most damaging, although a concentrated gust can also cause significant damage. As wind speeds increase, the extent of damage varies depending on a number of site-specific characteristics that will be discussed later in this section.

Although no specific areas of the Planning District can be designated as having a higher risk of being affected by a severe wind event, there are a number of factors that contribute to a particular area's vulnerability to damages if a high wind event should occur. Certain characteristics of an area or of a structure increase its resistance to damages then others. Many of these factors are extremely specific to the particular location, or the particular structure in question. However, each factor's affects on vulnerability can be discussed in general. The following is a list of these factors and a description of how they relate to vulnerability, particularly in the Planning District.

Design Wind Pressures

Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. The level to which these structures are designed, as expected, directly correlates with their ability to resist damages due to high winds. The State's building code dictates to what design wind speed a structure must be designed to. When stipulating the design wind load of residential and commercial structures, the Virginia Uniform Statewide Building Code refers to the standards developed in BOCA, 1996. As described in the previous section, the design wind speed for the Planning District is determined to be 70 mph. For some building types, those structures constructed subsequent to the adoption of the building code are the most likely to be the most resistant to damages from wind. However, the resistance to wind damage based on these code requirements is only effective to the level the requirements are enforced, and no comprehensive data on the date built for these structures exists for the Planning District.

Building Types

The type of building construction will have a significant impact on potential damages from high wind events. A summary of basic building types - listed in order of decreasing vulnerability (from most to least vulnerable) - is provided below.

- **Manufactured:** This building type includes manufactured buildings that are produced in large numbers of identical or smaller units. These structures typically include light metal structures or mobile homes.
- **Non-Engineered Wood:** Wood buildings that have not been specifically engineered during design. These structures may include single and multi-family residences, some one or two story apartment units, and small commercial buildings.
- **Non-Engineered Masonry:** Masonry buildings that have not been specifically engineered during design. These structures may include single and multi-family residences, some one or two story apartment units, and some small commercial buildings.
- **Lightly Engineered:** Structures of this type may combine masonry, light steel framing, open-web steel joists, wood framing, and wood rafters. Some portions of these buildings have been engineered attention while others have not. Examples of these structures include motels, commercial, and light industrial buildings.
- **Fully Engineered:** These buildings typically have been designed for a specific location, and have been fully engineered during design. Examples include high-rise office buildings, hotels, hospitals, and most public buildings.

The Planning District includes a variety of building types. Residential construction is primarily wood framed, varying from single story to multiple stories, although some masonry residential properties are present as well. As mentioned in the list above, non-engineered wood framed structures are among the most susceptible to potential damage. With this type of construction being the most prevalent for residential properties in the Planning District, a majority of residential structures in the area could be classified to have a high level of vulnerability to damages should a high wind event occur.

Other types of structures found throughout the Planning District that are vulnerable to damages during high wind events are metal framed buildings, primarily associated with light industrial buildings, as well as some agricultural buildings.

According to the Virginia Uniform Statewide Building Code, agricultural buildings, such as barns and silos, are required to meet minimum requirements and be constructed in accordance with the state building code. Although the potential for human losses in these structures may be lower, the potential for high amounts of damages are significant.

Other building related factors that impact the potential for damage include height, shape, and the integrity of the building envelope. Taller buildings and those with complex shapes and complicated roofs are subject to higher wind pressures than those with simple configurations. The building envelope is composed of exterior building components and cladding elements including doors and windows, exterior siding, roof coverings, and roof sheathing. Any failure or breach of the building envelope can lead to increased pressures on the interior of the structure, further damage to contents and framing, and possible collapse.

Critical Facilities

The vulnerability of critical facilities such as police and fire stations, hospitals, shelters, and utility services varies greatly depending on the factors described in the sections above. In order to accurately assess the relative vulnerability of these structures, data regarding the vulnerability factors would be required. Generalizations based on the vulnerability factors can be made in certain instances. Due to the high level of importance to the community, the ability of these structures to resist the forces of high wind events greatly affects the community's overall vulnerability to these hazards.

Estimating Losses

Due to the varying characteristics of the potential wind events that can affect the Planning District, preparing loss estimation for a particular event is not a simple task. Severe thunderstorms or straight line wind events could bring severe winds to the entire Planning District, although damages may only occur in localized areas. However, potential wind damages can be estimated on various structure types based on the potential wind speeds and building types described in the sections above.

The FEMA Benefit Cost module, used for estimating the benefits of potential wind mitigation projects, contains a wind damage function based on building type and potential wind speed. This wind damage function expresses the potential damage to a building as a percentage of the building's replacement value, and potential damages to a building's contents as a percentage of the value of its contents. For use in this module, FEMA separates structures according to the building types described in the Vulnerability Analysis section.

Using these building types, and the potential wind speeds for the Cumberland Plateau Planning District, potential damages can be expressed in terms of a percentage of the building and contents values. ASCE 7 categorizes the southwest Virginia area as a 90-mph wind zone, based on a 50-year recurrence interval. Based on ASCE 7, the potential wind speed for an event with a 100-year recurrence interval was estimated to be 107% of the 50-year wind speed, or 96.3 mph. Table V-15 includes estimates of potential damage of the specific building types in the four-county area for the 50- and 100-year interval wind event. It should be noted that the 100-year wind speed assumed corresponds with an F1 category tornado on the Fujita scale. Damages from the impact of a tornado stronger than an F1 could greatly exceed these estimates.

Table V-15: Potential Wind Damage by Building Type

	50-Year Event (90 mph)	100-Year Event (96.3 mph)

Building Type	Building Damage	Contents Damage	Building Damage	Contents Damage
Manufactured	25%	40%	50%	100%
Light Engineered	5%	2.5%	15%	15%
Non-Engineered Wood	7.5%	5%	20%	20%
Non-Engineered Masonry	5%	2.5%	15%	15%
Fully Engineered	2.5%	2.5%	5%	15%

A complete list of events from 2011-2018 can be found at the end of this document.

Earthquakes

The earth surface is composed of a series of tectonic plates, which are constantly moving and shifting against one another. The movement of these plates causes stress to develop along plate boundaries, and along fault lines. When the stress along one of these boundaries or fault lines exceeds the strength of the adjacent rock and earth, a slip or fracture occurs, releasing the built up energy as waves. Energy waves travel through the earth's crust up to the ground surface, causing the shaking that is associated with an earthquake.

Earthquakes in the United States occur most frequently along the West Coast, due to the close proximity to the North American plate boundary. Earthquakes can also occur along the East Coast of the United States, but the mechanisms causing these earthquakes are as not well understood, as these earthquakes occur within the plate rather than at plate boundaries (USGS, 2003).

The Commonwealth of Virginia is subject to earthquakes occurring in two primary areas of seismic activity. The Eastern Tennessee Seismic Zone extends from Charleston, South Carolina through western North Carolina and eastern Tennessee into central Virginia. The New Madrid Seismic Zone is located in southern Missouri. Both zones have the potential to affect the Cumberland Plateau Planning District. Although these faults have not produced a significant earthquake in recent years, both have a history and the potential to produce severely damaging earthquakes in the future.

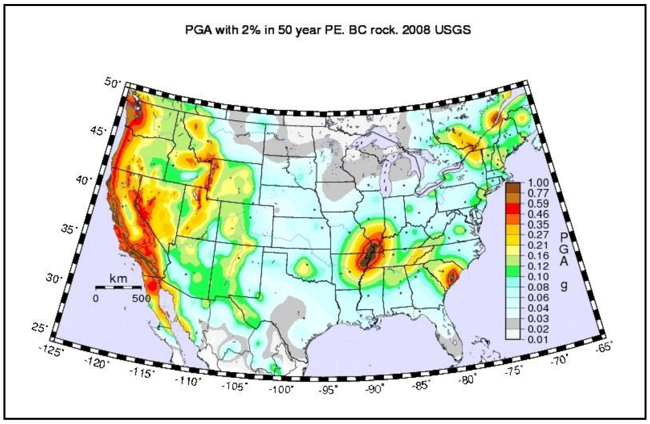


Figure V-9 — Earthquake Probability Map

When earthquakes occur, the shaking motion is measured on an instrument called a seismograph. The wave peaks on a seismograph indicate the strength of the shaking motion of the earthquake. The magnitude of an earthquake depends on how much energy is released and is used to measure the size of an earthquake's source (USGS, 2003). The magnitude is expressed in terms of the Richter scale, which is a logarithmic mathematical formula based on the amplitude of the waves measured by the seismograph. The Richter scale uses whole numbers and decimals to measure earthquake magnitudes.

In addition to magnitude, an earthquake also can be measured in terms of intensity. The intensity of an earthquake is the effect of the earthquake on the earth's surface. In the United States, the intensity is commonly measured with the Modified Mercalli Intensity Scale (MMI). This scale assigns an intensity level to an earthquake depending on the effects of an earthquake felt at a particular location, such as chimneys damaged, people awakened, and levels of building damage. Because this scale is based on the actual effects of an event, the intensity of a particular earthquake will vary by location, generally decreasing in intensity the farther the location is from the epicenter (the source of the earthquake).

The following table includes the levels for both the MMI scale and the Richter scale, as well as the associated levels of damages.

Table V-16 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale
1	Instrumental	Detected only on seismographs	<10	
II	Feeble	Some people feel it	<25	**<4.2**
III	Slight	Felt by people resting; like a truck rumbling by	<50	

Table V-16 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale
IV	Moderate	Felt by people walking	<100	
V	Slightly Strong	Sleepers awake; church bells ring	<250	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<500	<5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls	<1000	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	<2500	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<5000	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7500	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<9800	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>9800	>8.1

Hazard History

The largest recorded earthquake to occur along the East Coast of the United States occurred in Charleston, South Carolina on September 1, 1886. This earthquake is estimated to have been magnitude 7.3 on the Richter scale and was felt as far away as Boston, Massachusetts and Milwaukee, Wisconsin. Overall, this earthquake resulted in 60 lives lost and an estimated $5 - $6 million in damages.

The largest historic earthquake to occur within the Commonwealth of Virginia occurred in Giles County on May 31, 1897. There were other seismic events preceding the earthquake, as tremors on May 3, 1897 caused damage in the areas around Pulaski, Radford, and Roanoke. In addition, loud rumblings were reported near the epicenter between May 3 and May 31. The event of May 31 was felt from Georgia to Pennsylvania and as far west as Indiana and Kentucky, encompassing a 280,000 square mile area. In Pearisburg, Virginia, walls of old brick houses cracked, bricks were thrown from chimney tops, springs were muddied, and some earth fissures appeared. Minor aftershocks continued through June 6, 1897, and other shocks were observed on June 28, September 3, and October 21. On February 5, 1898, Pulaski reported additional chimney damage and people rushed into the street during a tremor.

The Cumberland Plateau Planning District was also impacted by the 1811-1812 earthquakes that occurred along the New Madrid fault in Missouri. This earthquake had an approximate magnitude of 7.2 at its epicenter and had an intensity of VI throughout the Planning District. Although powerful, damages associated with this earthquake were limited due to the relatively low population density throughout the region at the time of the event.

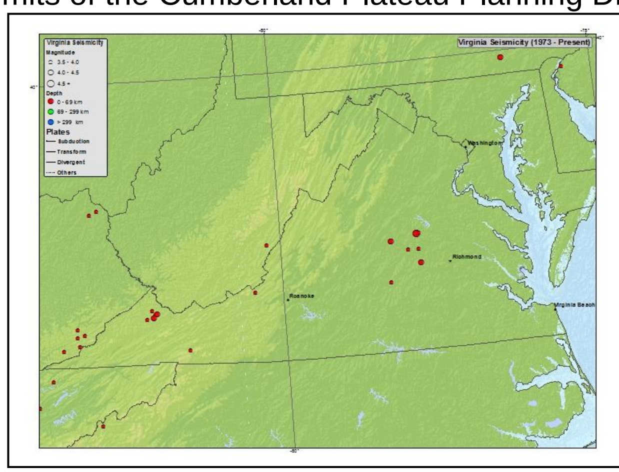
The following table includes a list of recorded earthquakes that have either occurred in the Commonwealth of Virginia, or have occurred in neighboring states that have affected Virginia, based on the most complete data available. The intensity and magnitude of all these events are not known, and in some cases damages may have occurred but were not recorded. This table is not intended to represent earthquakes affecting the Planning District, but to provide an overview of the seismic history of Virginia.

Table V-17 — Historic Earthquakes affecting Virginia			
Date	Location	Magnitude Intensity	Description
February 21, 1774	Virginia/NC	Unknown	Shock felt throughout area
December 1811 February 1812	New Madrid, MO	Intensity: VI Magnitude: 7.1-7.2	Small amount of damage due to low population density
March 9, 1828	Southwestern Virginia	Intensity: V	Shaking felt throughout State
August 27, 1833	Richmond, VA	Intensity: V	Two miners killed in Dover Mills near Richmond
April 29, 1852	Wytheville, VA	Intensity: VI	Chimney damage, windows rattled
August 31, 1861	Southwestern Virginia	Intensity: VI	Chimney damage *(note: occurred during Civil War so details sketchy)*
December 22, 1875	Manakin, VA	Intensity: VII	Chimneys broken, shingles shaken off, glass broken
May 3, 1807	Pulaski, VA	Intensity: VI	Loud rumblings
May 31, 1897	Giles County, VA	Intensity: VII	Brick walls cracked, bricks thrown from chimney tops, springs muddied, earth fissures appeared
June 28, 1897	Giles County, VA	Intensity: I	Aftershock
September 3, 1897	Giles County, VA	Intensity: I	Aftershock
October 21, 1897	Giles County, VA	Intensity: I	Aftershock
February 5, 1898	Pulaski	Intensity: VI	Chimney damage, people rushed into streets
February 11, 1907	Arvonia, VA	Intensity: VI	Minor damage, small area affected
August 23, 1908	Arvonia, VA	Intensity: II	Aftershock

Table V-17 — Historic Earthquakes affecting Virginia			
Date	Location	Magnitude Intensity	Description
May 8, 1910	Arvonia, VA	Intensity: II	Aftershock
April 9, 1918	Luray, VA	Intensity: VI	Broken windows in Washington DC
September 5, 1919	Front Royal, VA	Intensity: VI	Chimney damage, springs & streams muddied
December 26, 1929	Charlottesville, VA	Intensity: VI	Bricks thrown from chimneys
April 23, 1959	Giles County	Intensity: VI	Chimney damage, plaster cracked, pictures fell
May 5, 2003	Goochland County, VA	Magnitude: 3.9	Rumblings, no damage
Dec. 9,2003	Nelson County, VA	Magnitude 4.5	Slight Damage
August 23, 2011	Louisa County, VA	Intensity: VII Magnitude 5.8	Moderately heavy damage

TVA 1957 USGS

The map included in Figure V-10, prepared by the National Earthquake Information Center, displays the locations of historic earthquakes in the Commonwealth of Virginia, along with the different topographic regions of the state. The greatest concentration of earthquakes have occurred in the western portion of the state, throughout the Blue Ridge mountains, and several in the Commonwealth of Kentucky. No earthquakes have originated within the limits of the Cumberland Plateau Planning District.



NOAA: (http://neic.usgs.gov/neis/states/virginia/virginia_seismicity.html)
Figure V-10 — Seismicity of Virginia 1973 to Present

Hazard Profile

Depending on the location, magnitude, and intensity of an earthquake, the damages and associated impacts to the community can vary greatly. As described in Table V-16, the impacts can be as mild as light shaking barely noticeable to citizens, to as large as totally destroyed building and infrastructure.

In an attempt to quantify the risk of damages due to an earthquake throughout the United States, the USGS, through the Earthquake Hazard Program, has developed maps displaying likely levels of ground motion due to future earthquakes. When developing these maps, USGS considered the potential magnitude and locations of future earthquakes based on historical data and geological information on the recurrence intervals of fault ruptures. Using this data, the extent of potential ground shaking with a 10 percent, 5 percent, and 2 percent chance of being exceeded in a 50-year period has been calculated, and contour lines have been interpolated are delineated on hazard maps.

The most commonly used method to quantify potential ground motion is in terms of peak ground acceleration (pga). During an earthquake, particles on the earth move in response to the energy waves released at the epicenter. How quickly these particles accelerate directly proportionate to the anticipated level of damages due to an earthquake, with the higher levels of acceleration causing the most significant damage. Peak ground acceleration is expressed as a percentage of a known acceleration, the acceleration of gravity ($9.8 m/s^2$), and is commonly referred to as "%g".

Figure V-11 displays the peak acceleration for the Commonwealth of Virginia with a 2 percent chance of being exceeded in a 50-year period. As can be seen in the figure, the virtually all of the Cumberland Plateau Planning District is located between the 16% of g contour and the 20% of g contour, with some portions having a value slightly greater than 20% of g.

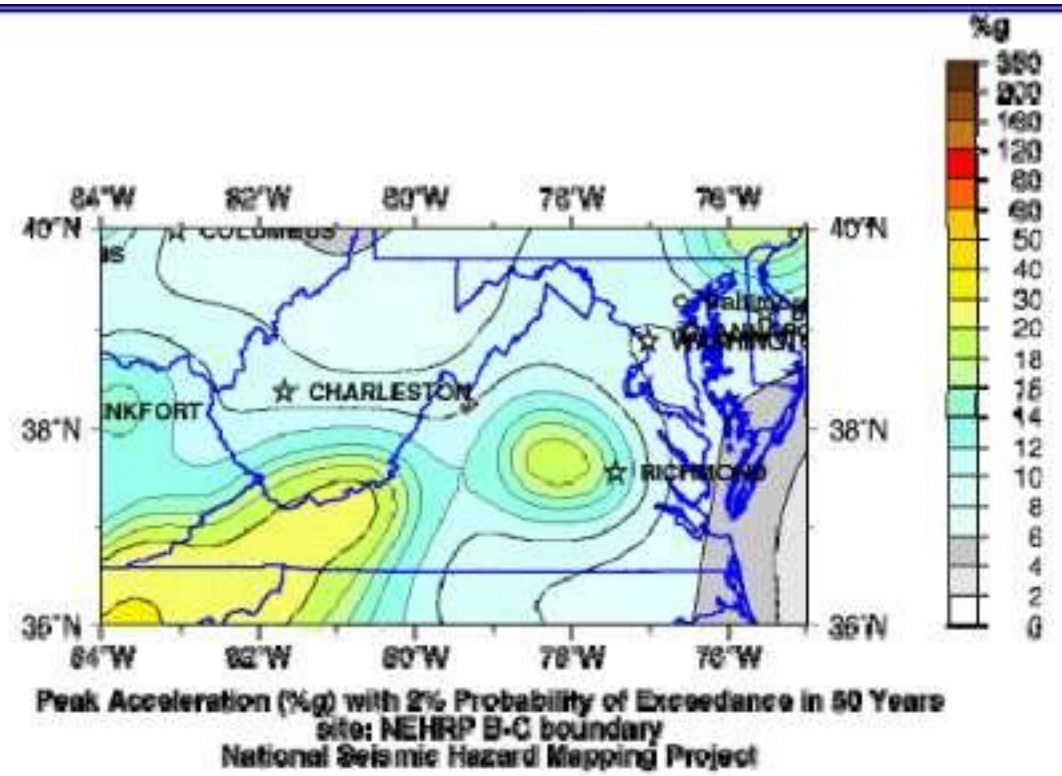


Figure V-11 — Peak Acceleration Probability Map of Virginia

Using the scale provided in Table V-16 this level of ground shaking is slightly greater to that associated with a level VII (MMI) intensity earthquake or between 6.1 and 6.9 on the Richter scale. Typical damages associated with this earthquake include cars moving uncontrollablely, masonry walls and building fracturing, and poorly constructed buildings being damaged. It should be noted that this is not the highest intensity earthquake that could affect the Planning District. Earthquakes of greater and lesser intensities can occur, and have lower and higher probability levels, respectively.

Hazard Areas

Because of the large area affected by most earthquakes, as well as the vast diversity of the locations and intensities of historic earthquakes that have and can affect southwestern Virginia, no specific areas of the Cumberland Plateau Planning District can be identified as having a higher risk of being affected by an earthquake. However, this same distinction also indicates that the entire Planning District is at a similar risk to earthquake.

Some slightly elevated hazards may be experienced in those areas subjected to deep mining. The presence of mine portals and shafts in the subterrain provide the rock strata with a void in which to settle following a seismic event. The settlement of earth into these voids can cause fissures or sinkholes on the surface, which could cause significant damage to buildings and other infrastructure on the surface, even following a minor seismic event.

Vulnerability Analysis

The effects of earthquakes are wide-ranging, from little or no effect, to major structural damage. The degree of damage largely depends on the location of the epicenter relative to the community and the magnitude of the event. As stated previously, these factors can not be controlled or predicted. Other factors such as the level of seismic design, the type of construction, and other site specific characteristics also play a role in the level of damages sustained during an earth quake.

The municipalities within the Cumberland Plateau Planning District currently utilize the Virginia Uniform Building Code. The Code, which references the seismic design level from BOCA 96, requires varying levels of seismic design, which depend on an importance factor determined by the structures use and nature of occupancy. The higher levels of seismic design are assigned to those structures where the risk of injury or loss of life is highest, or those whose function is most critical to the community should an event occur. Examples of these structures include a schools, health care facilities, power generating facilities, water and wastewater treatment facilities, police stations, and fire stations. Although these structures are required to be designed to resist higher levels of seismic activity, they also represent the highest vulnerability to earthquake losses within the Planning District.

When assessing vulnerability, a discussion of the probability of earthquake activity is necessary. As noted in earlier sections, there are two distinct seismic zones affecting the Planning District - the New Madrid Seismic Zone and the East Tennessee Seismic Zone.

Table V-18 —Periodicity of Earthquakes for the New Madrid Seismic Zone

Magnitude	Recurrence	$PROB_{15}$	PROB50
>8.0	550-1200	0.3-1	2.7-4.0
7.0	255-500	5-9	19-29
6.0	70-90	40-63	86-97
5.0	10-12	~100	~100
4.0	14 months	~100	~100

http://www. uky. edu/ArtsSciences/Geology/webdogs/virtky/

From the above chart, it is apparent that there is a great chance that a magnitude 6 earthquake will strike the New Madrid Seismic Zone before the year 2040. This translates into the potential for property destruction when the event occurs. It has been estimated that if an earthquake similar to that of December 16, 1811, were to strike today, thousands of deaths would result at the epicenter, as well as billions of dollars in damage. Within the Cumberland Plateau Planning District, an Intensity Level of VI could be anticipated, meaning potential for chimney damage, plaster walls cracking, and some glass breakage.

Primary and Secondary Impacts

As listed in Table V-161, the primary impact of an earthquake can range from toppled chimneys and broken windows, to crack walls and roadways, to complete collapse of structures and bridges. Depending on the magnitude and location of the earthquake, the overall effects on the community can range from minimal to catastrophic. In larger events, loss of life and injuries can be extensive and the cost of damages can be massive. As stated previously, although historically moderate earthquakes have affected the Planning District, the potential for a higher magnitude earthquake does exist, due mainly to the proximity of the two key seismic zones.

In some cases, the secondary impacts from an earthquake can be as damaging and disruptive to a community and its citizens. The most significant potential secondary effect of an earthquake to the Planning District is the potential for landslides. Ground shaking during an earthquake can cause previously weakened steep slopes to fail, as well as otherwise stable slopes. The specific impacts of landslides are discussed further in other sections of this plan.

In addition to landslides other secondary effects can include disruption of critical services such as water, electrical, and telephone services. Damage to police stations, fire stations, and other emergency service facilities can weaken a community's ability to respond in the crucial hours and days following an event.

A complete list of events from 2011-2018 can be found at the end of this document.

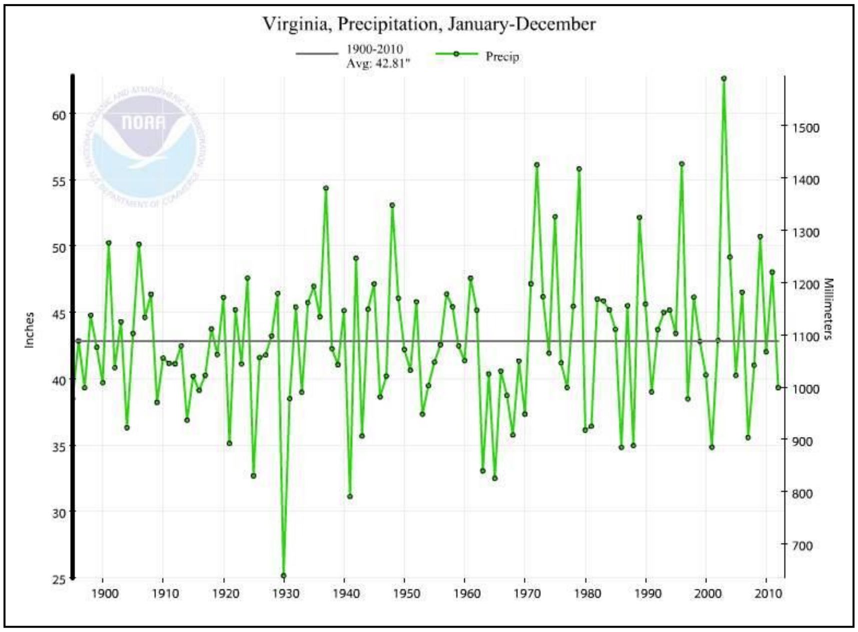
Drought

"Drought is a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area" (USGS, 2000). Three significant types of drought can affect the Cumberland Plateau Planning District, which are meteorological, agricultural, or hydrologic drought. Meteorological drought is simply a departure from a normal precipitation amount, and is reliant on no other factors. Agricultural drought describes a soil moisture deficiency to the extent it effects the needs of plant life, primarily crops. Hydrologic drought is defined in terms of shortfall of water levels of lakes and reservoirs, and stream flow in rivers, streams, and soils (Multi Hazard Risk Assessment, 2000). Drought is a natural part of most climatic areas, but the severity of droughts differs based on duration, geographic extent, and intensity.

Hazard History

There have been a number of significant droughts recorded in Virginia since 1900. The most recent drought extended over a period of one year, from 2007 to 2008. This period saw rainfall levels well below normal and caused many communities throughout the region to institute water restrictions.

Although meteorologists have attempted to predict long term changes and trends in weather patterns, the onset of a significant drought cannot be predicted. Extended periods of dry weather have occurred many times from over the past 100 years.



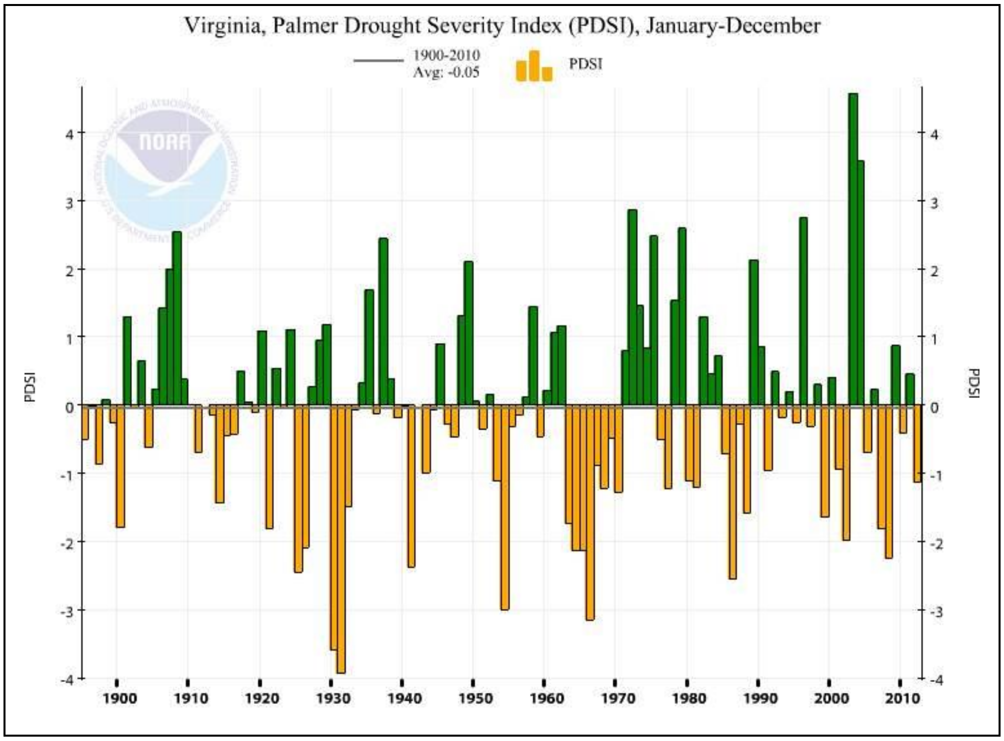
V-12 — Virginia Statewide Precipitation, January 1900-2010

Hazard Profile

Just as there are multiple types of drought, there are multiple methods to indicate when a drought is occurring, as well as the severity of the drought. The multiple indices are based on a variety of data including precipitation amounts, stream flows, soil moisture, snow pack, as well as other water storage data. Commonly, the drought indices used depends on the type of drought being measured. It is important to note that not all types of drought must be occurring simultaneously. In some cases an area can be affected by one form of drought, while levels measuring another form of drought are normal.

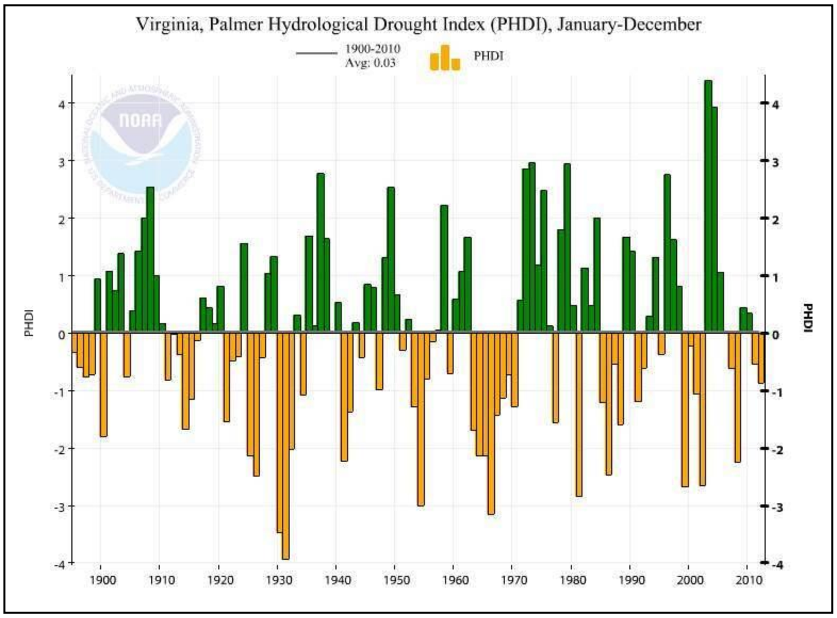
The most commonly used drought indicator is the Palmer Drought Index. This index was developed in the 1960s by the National Oceanic and Atmospheric Administration, and uses temperature and rainfall data to determine dryness. Negative numbers indicate drought, while positive numbers indicate surplus rainfall. Minus two is considered a moderate drought, minus three is severe drought, and minus four is extreme drought. Likewise, positive two is considered a moderate rainfall, positive three a severe rainfall, and positive four, an extreme rainfall. In addition to the Palmer Index, the Standard Precipitation Index (SPI) and the Crop Moisture Index (CMI) also are used to measure drought. The SPI relates the deficit in precipitation compared to normal levels to varying degrees of time. Because the duration of lower than average precipitation levels has varying effects on stream flows, water storage levels, and soil moisture content, the SPI attempts to measure drought based on the long term deficit in precipitation. The CMI measures short term moisture conditions across predominate crop producing regions. It is based on the temperature and precipitation levels for a given week as well as the CMI value for the previous week (http://www.drought.unl.edu/whatis/indices.htm).

The Virginia State Climatology Office uses the Palmer Drought Severity Index (PDSI) to measure long-term moisture status. A reading of -3.0 is considered to be a "severe drought.".Shown below is the PDSI history for Virginia from 1900 through December 1, 2010. .



Virginia State Climatology Office

Figure V-13 —Virginia Palmer Drought Severity Index



V-14 — Virginia Statewide Palmer Hydrological Drought Index, January 1900 - December 2010

Vulnerability Analysis

If a significant drought event were to occur, it could bring extensive economic, social, and environmental impacts to the Planning District. Commonly one of the most significant economic effects to a community is the agricultural impacts. Other economic effects could be felt by businesses that rely on adequate water levels for their day to day business such as carwashes and laundromats.

Drought also can create conditions that promote the occurrence of other natural hazards such as wildfires and wind erosion. The likelihood of flash flooding is increased if a period of severe drought is followed by a period of extreme precipitation. Low-flow conditions also decrease the quantity and pressure of water available to firefighters to fight fires, while the dry conditions increase the likelihood fires will occur.

Environmental drought impacts include those on both human and animal habitats and hydrologic units. During periods of drought, the amount of available water decreases in lakes, streams, aquifers, soil, wetlands, springs, and other surface and subsurface water sources. This decrease in water availability can affect water quality such as salinity, bacteria, turbidity, and temperature increase and pH changes. Changes in any of these levels can have a significant effect on the aquatic habitat of a numerous plants and animals found throughout the Planning District. Low water flow can result in decreased sewage flows and subsequent increases in contaminants in the water supply. Decrease in the availability of water also decreases drinking water supply and the food supply as food sources become scarcer. This disruption can work its way up the food chain within a habitat. Loss of biodiversity and increases in mortality can lead to increases in disease and endangered species.

A complete list of events from 2011-2018 can be found at the end of this document.

Severe Thunderstorms & Hail

Thunderstorms arise from atmospheric turbulence caused by unstable warm air rising rapidly into the atmosphere, enough moisture to form clouds and rain and an upward lift of air currents caused by colliding warm and cold weather fronts, sea breezes or mountains.

Thunderstorms are always accompanied by lightning, but they may also be associated with heavy rains, hail and violent thunderstorm winds. Thunderstorms occur most often during the spring and summer months and can occur throughout the region. Nationwide the average storm is 15 miles wide and generally last less than 30 minutes at any given location. Some storm systems have been known to travel more than 600 miles.

Thunderstorms in the Cumberland Plateau region present a threat especially due to their association with other major hazards in the area. Thunderstorms bringing heavy rain can cause flooding, the primary hazard to the Cumberland Plateau; they can also cause wildfires and even potentially domestic fires, which are a growing threat to the region. Heavy rainfall can result in landslides in areas where soil is not secure, and hail presents the chance of crop damage in agricultural communities—though there are very few, if any reports in the CPPDC area from hail causing crop damage. While hail is an infrequent occurrence in the CPPDC region, it does occur, and can result in property damage in severe cases.

Dam Failure

There are a number of dams throughout the CPPDC region; many are privately-owned dams on farm lands with relatively little information on record. Several coal slurry and fly ash impoundment dams exist in the region, which could present major impacts to both human life and the environment were they to fail. Virginia's Department of Conservation and Recreation (DCR) operates the Dam Safety and Floodplain Management program (DSFPM) and categorizes 8 dams in the region as *High* in Hazard Class: John W. Flannagan Dam (Dickenson Co), White Oak Creek Dam (Dickenson), Laurel Bed Dam (Russell), Clinch River Fly Ash Dam #2 (Russell), Upper Clinch River Dam #8 (Tazewell), Falls Mills Dam (Tazewell), and Upper Clinch Valley Dam #1B (Tazewell).

Dam failure presents itself as an especially prominent threat in regard to the John W Flannagan Dam in Dickenson County. While there is little to no evidence to suggest a potential dam failure at this location, which is well-maintained by the US Army Corps of Engineers, a dam failure here would be catastrophic for a bevy of reasons. Flannagan Reservoir is the primary source of public water for most of Dickenson County as well as significant portions of neighboring Buchanan County. A dam failure would immediately pose a threat to public water services. Numerous properties are also located downstream from the John W Flannagan Dam, and a dam failure on a large scale would cause millions of dollars in property damage and present a severe threat to life downstream.

Domestic Fire

Domestic Fire has been a growing threat to the CPPDC region, especially so in the last decade. The majority of homes in the area were built prior to 1980, and as an area with economic struggles, many residents do not possess the capital necessary to ensure their home is kept up to date with modern electrical wiring or heating.

Due to aging homes and little fiscal capability to update those homes, there has been a surge in domestic fires in the area in recent years. Russell County has been especially effected by this surge, with as many as 100 or more domestic fires in the county each year. The number of domestic fires tends to increase during the Fall and Winter months as residents are more heavily reliant on electricity or wood stoves to keep their homes warm during cold months. As the region's homes continue to age, the number of domestic fires are expected to continue to increase, potentially resulting in an increased threat level of 'High' in future Hazard Mitigation Plan updates.

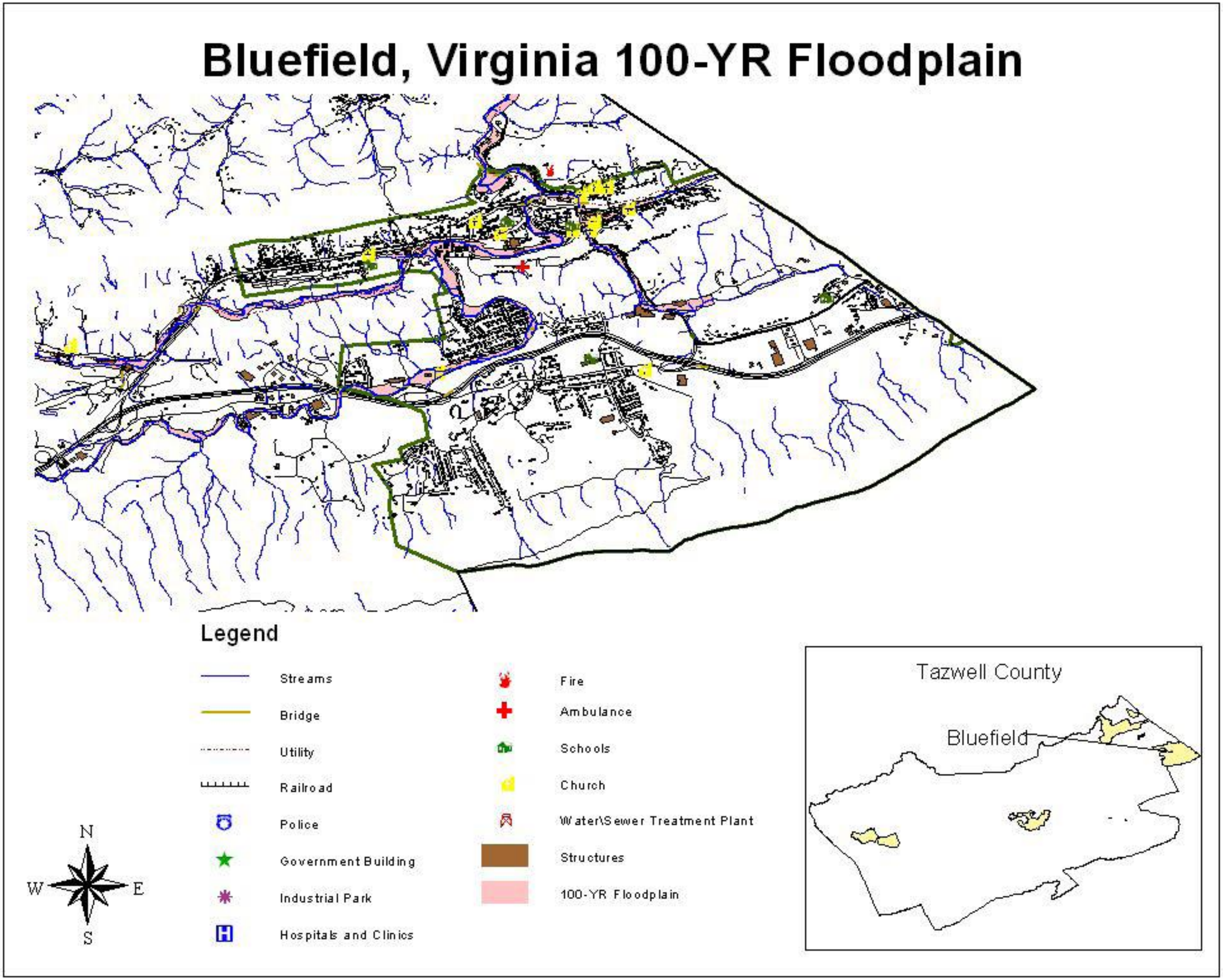
Algae Bloom

Algae Blooms are a very recently-added threat to the region and primarily affect the residents in Dickenson and Buchanan Counties. In 2018, the first major Algae Bloom in the region occurred at John W Flannagan Dam in Dickenson County. This occurrence has been attributed to temperature variations in the region due to global climate change. In 2019, a second bloom occurred, and thus algae blooms are expected to become a more frequent occurrence in the future.

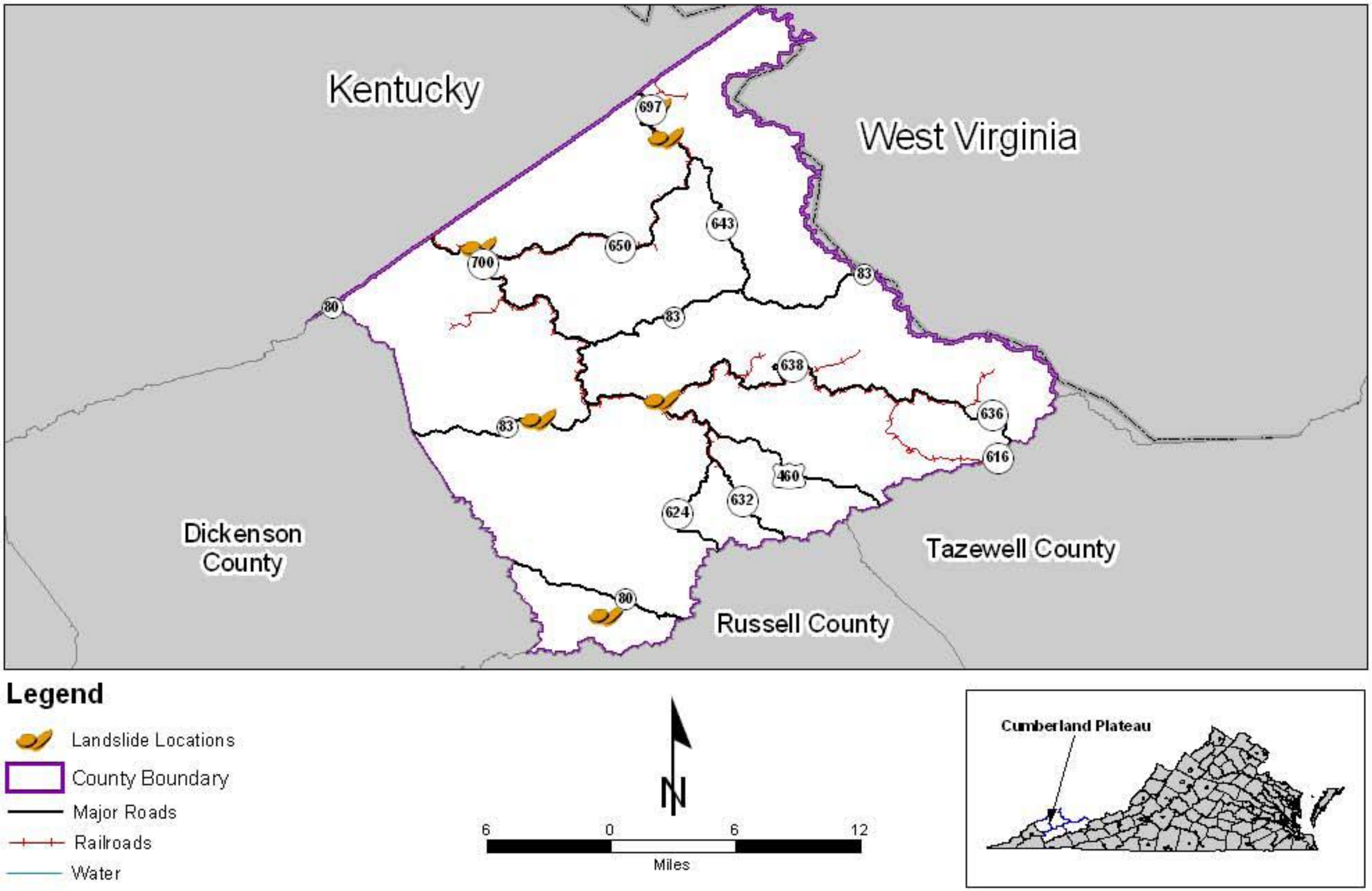
Algae Blooms present a threat both recreational activities in the John W Flannagan Dam reservoir – animals, especially pets, which are exposed to the algae can become sick or die as a result of ingesting the algae. But a major concern presents itself to residents as well. Since John W Flannagan Dam's reservoir provides public water to both Dickenson and Buchanan Counties, more frequent blooms can potentially impact public water services in the future. Several government organizations have begun studies on the algae blooms at the reservoir and will monitor the situation closely moving forward.

Abandoned Mine Fire/Flood

Another threat to the region comes in the form of abandoned mine fires and floods. Thousands of currently-operating and abandoned coal mines throughout the region present a threat to public safety if a fire were to break out or a mine seal to break, allowing water inside to escape. While abandoned mine fires are relatively infrequent, they can severely impact a region if they are not rapidly controlled, as seen in Centralia, Pennsylvania, where an entire town was required to be evacuated. Abandoned mine fires can result in toxic gas erupting from the ground, heavily-increased temperatures in surface soil, and even suddenly-forming sinkholes that threaten both homes and residents. Mine floods have become a threat as well, as many older mines in the area can potentially have water escape, threatening the property & lives of communities.


Bluefield, Virginia 100-YR Floodplain
Legend
Streams
Bridge
Utility
Railroad
Police
Government Building
Industrial Park
Hospitals and Clinics
Fire
Ambulance
Schools
Church
Water\Sewer Treatment Plant
Structures
100-YR Floodplain
N
W
E
S
Tazwell County
Bluefield

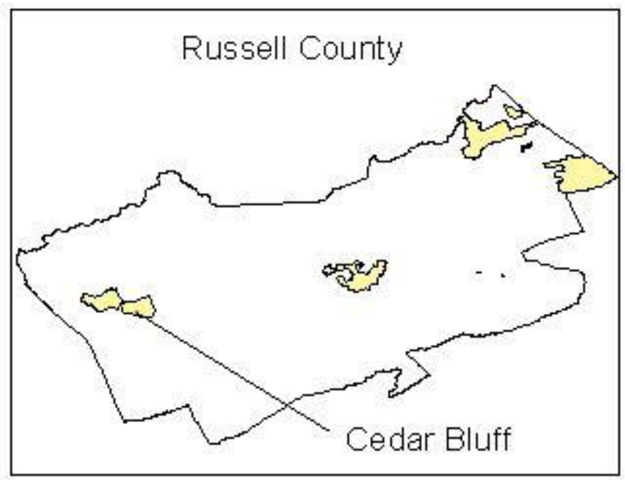
Buchanan County, Virginia Landslide Locations



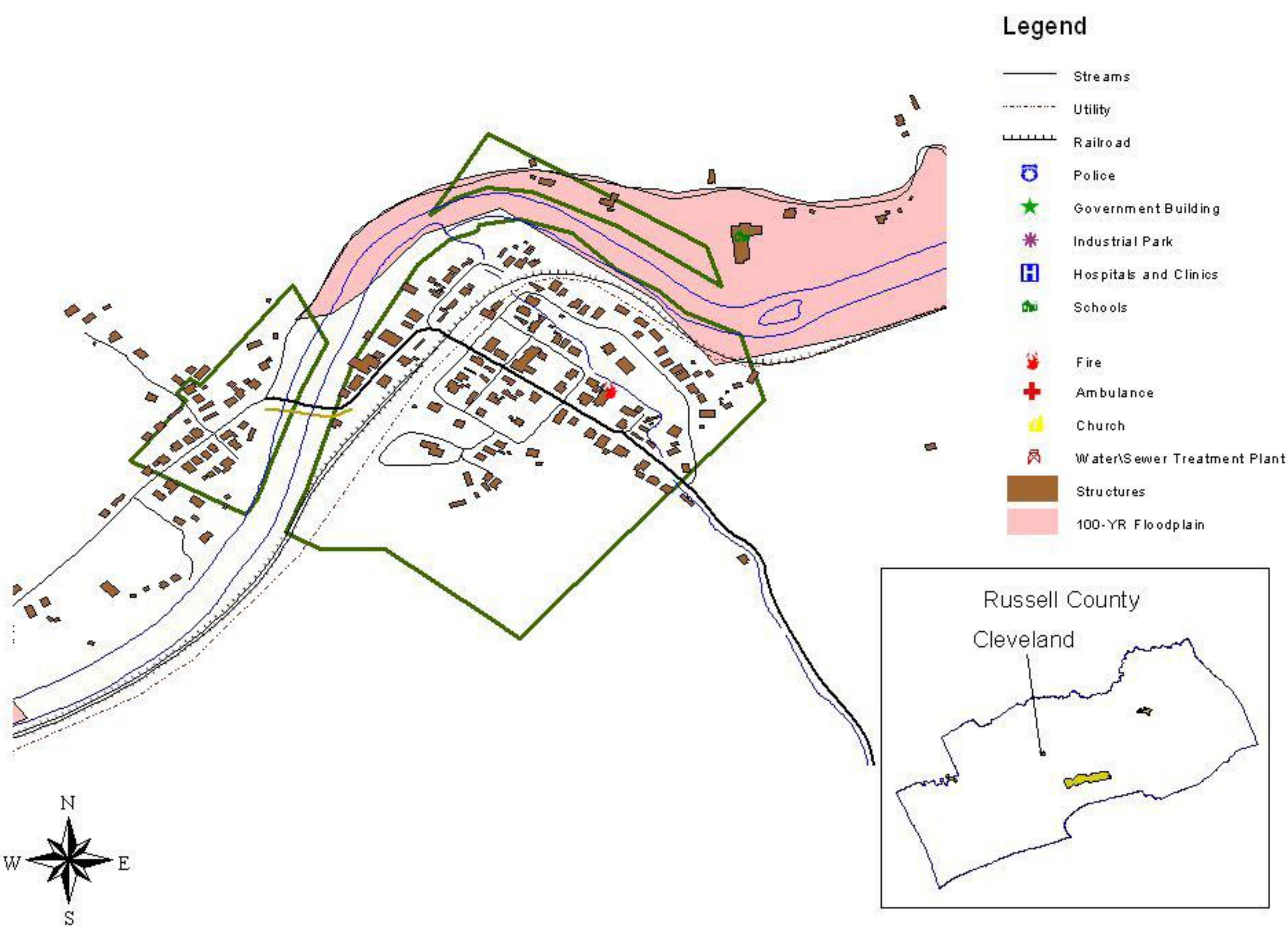
Cedar Bluff, Virginia 100-YR Floodplain

Legend

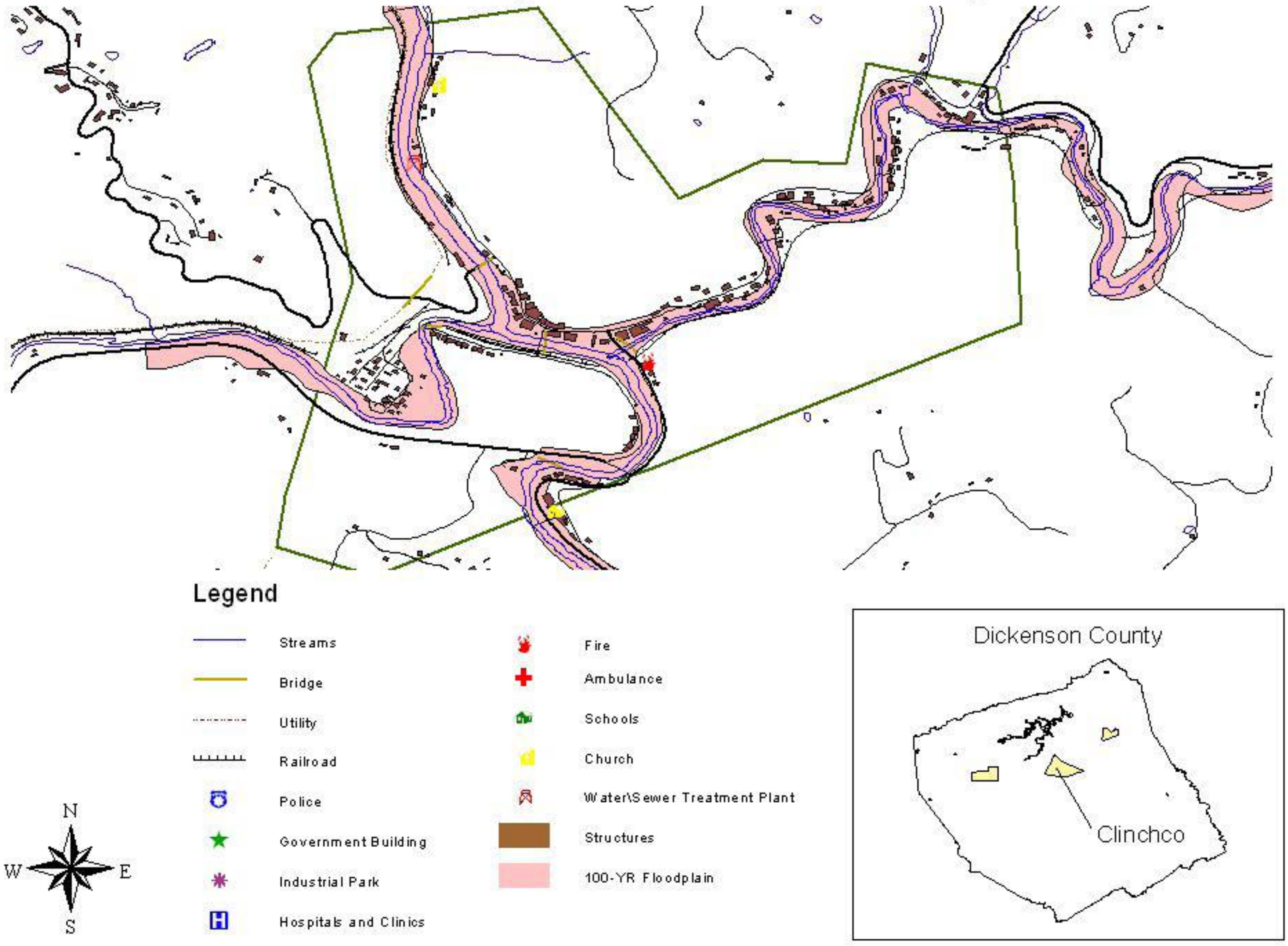
Streams
Bridge
Utility
Railroad
Police
Government Building
Industrial Park
Hospitals and Clinics
Fire
Ambulance
Schools
Church
Water\Sewer Treatment Plant
Structures
100-YR Floodplain

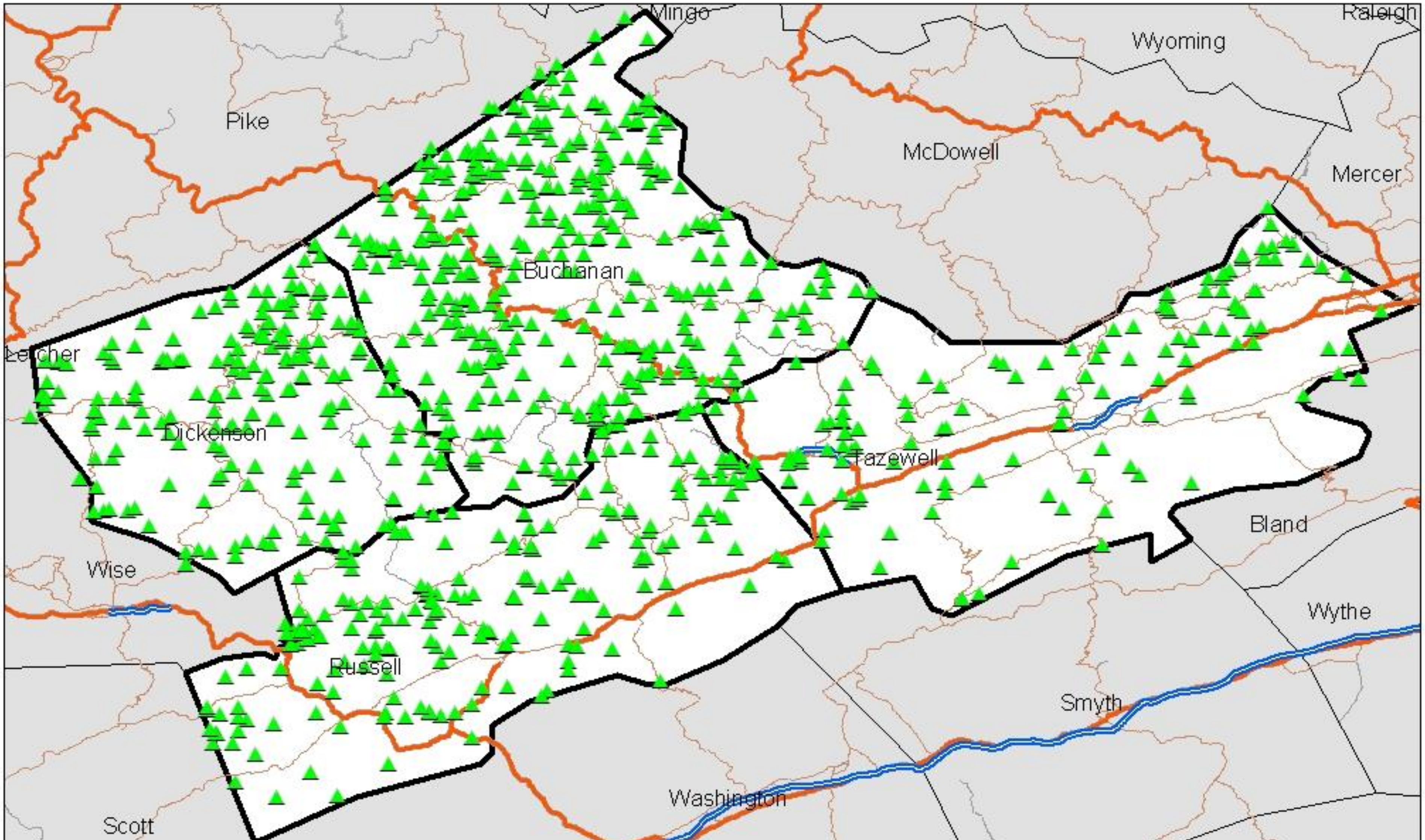


Cleveland, Virginia 100-YR Floodplain

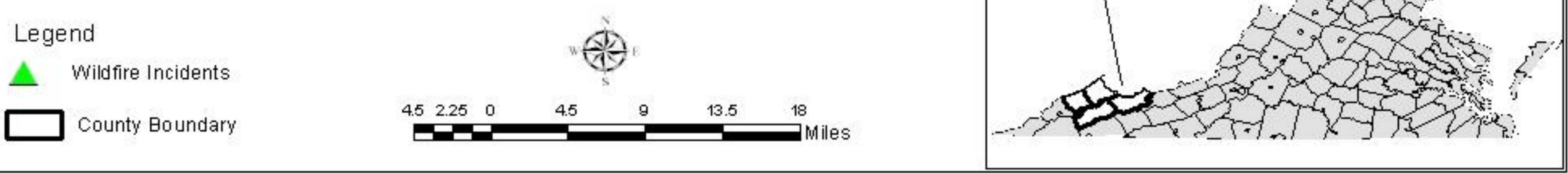


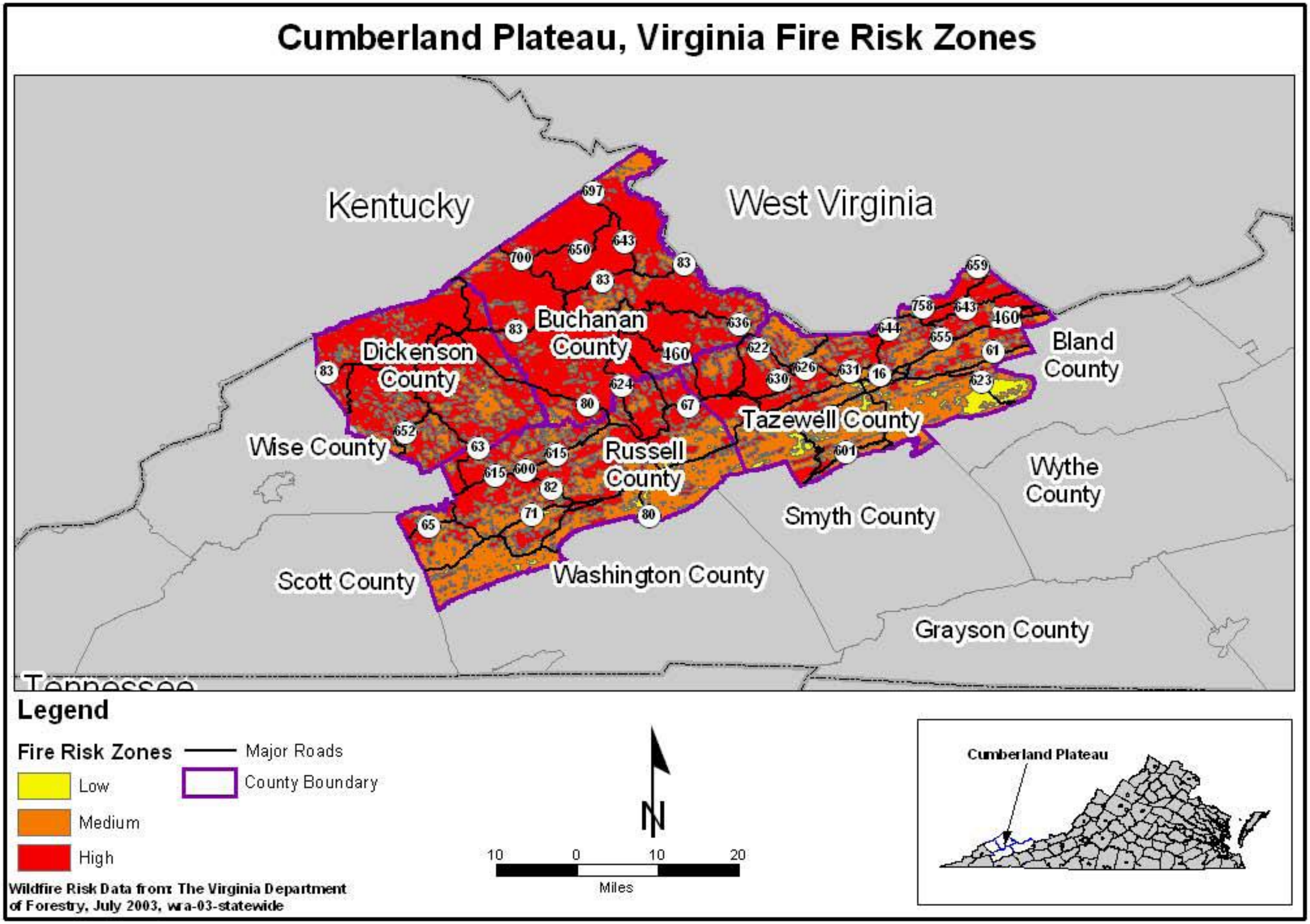
Clinchco, Virginia 100-YR Floodplain





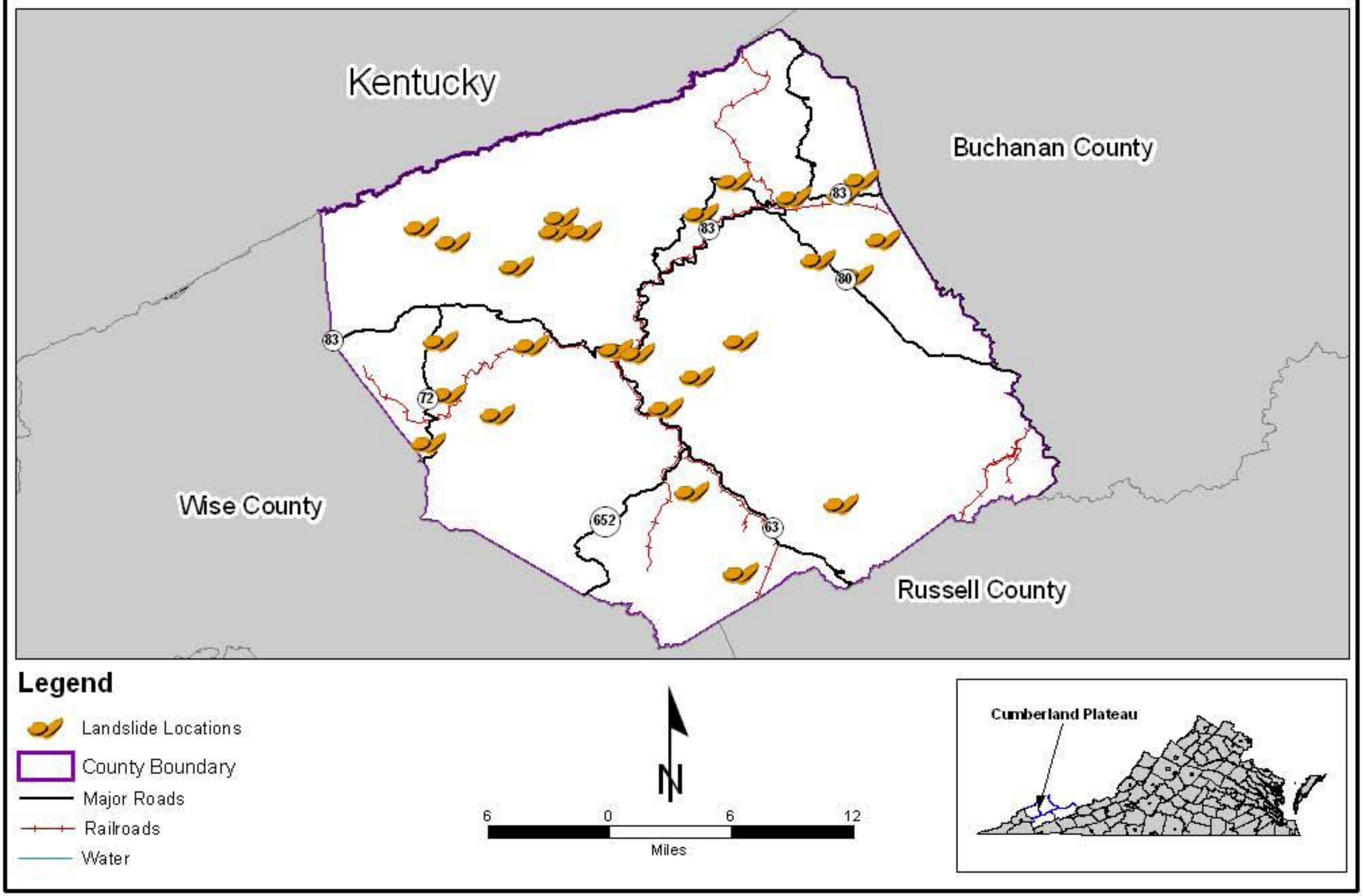
Cumberland Plateau, Wildfire Incidents From 1995 - 2008



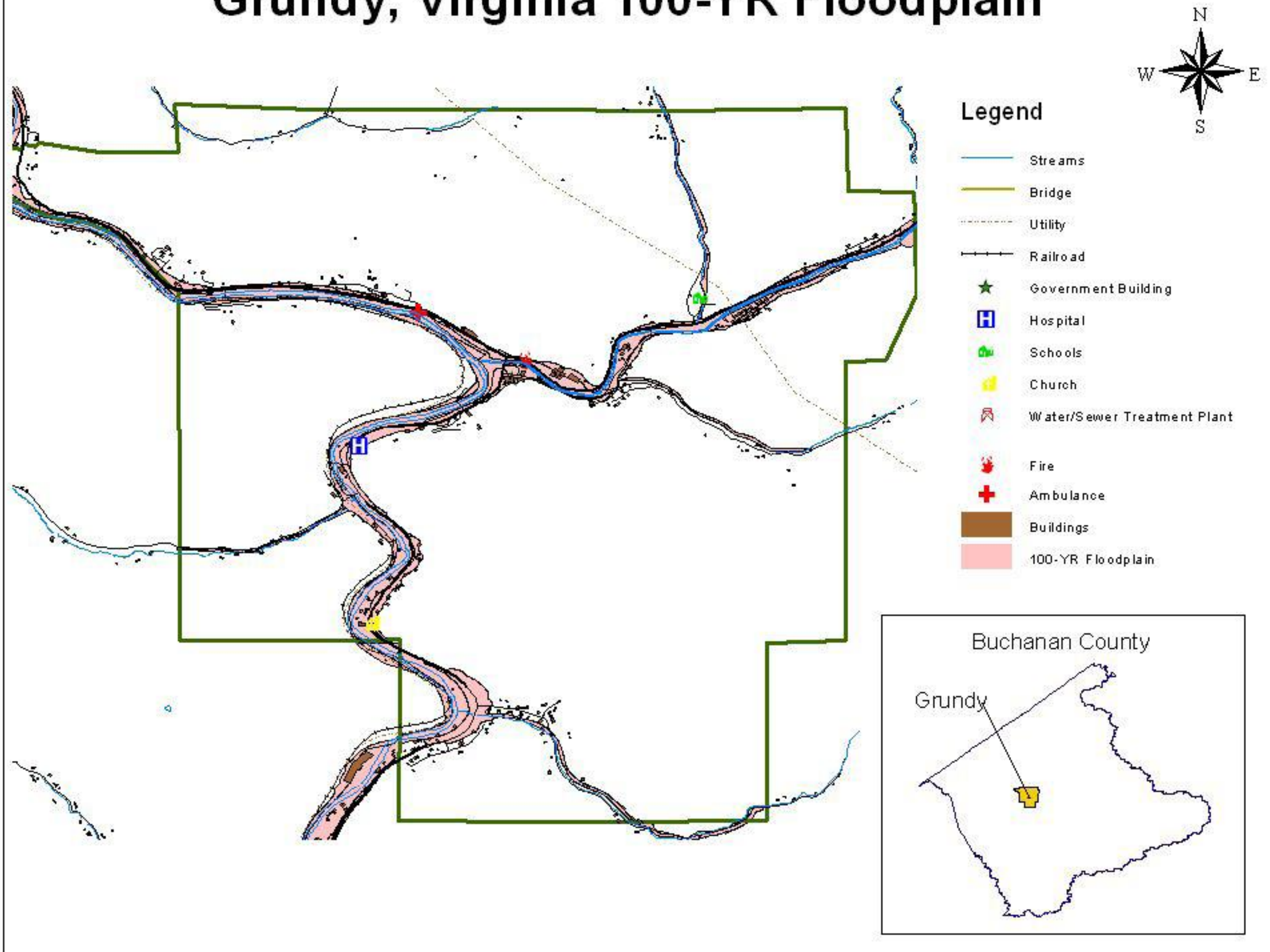


Cumberland Plateau, Virginia Fire Risk Zones
Kentucky
West Virginia
Buchanan County
Dickenson County
Wise County
Russell County
Tazewell County
Bland County
Wythe County
Smyth County
Scott County
Washington County
Grayson County
Tennessee
Legend
Fire Risk Zones
Low
Medium
High
Major Roads
County Boundary
N
10 0 10 20
Miles
Cumberland Plateau
Wildfire Risk Data from: The Virginia Department of Forestry, July 2003, wra-03-statewide

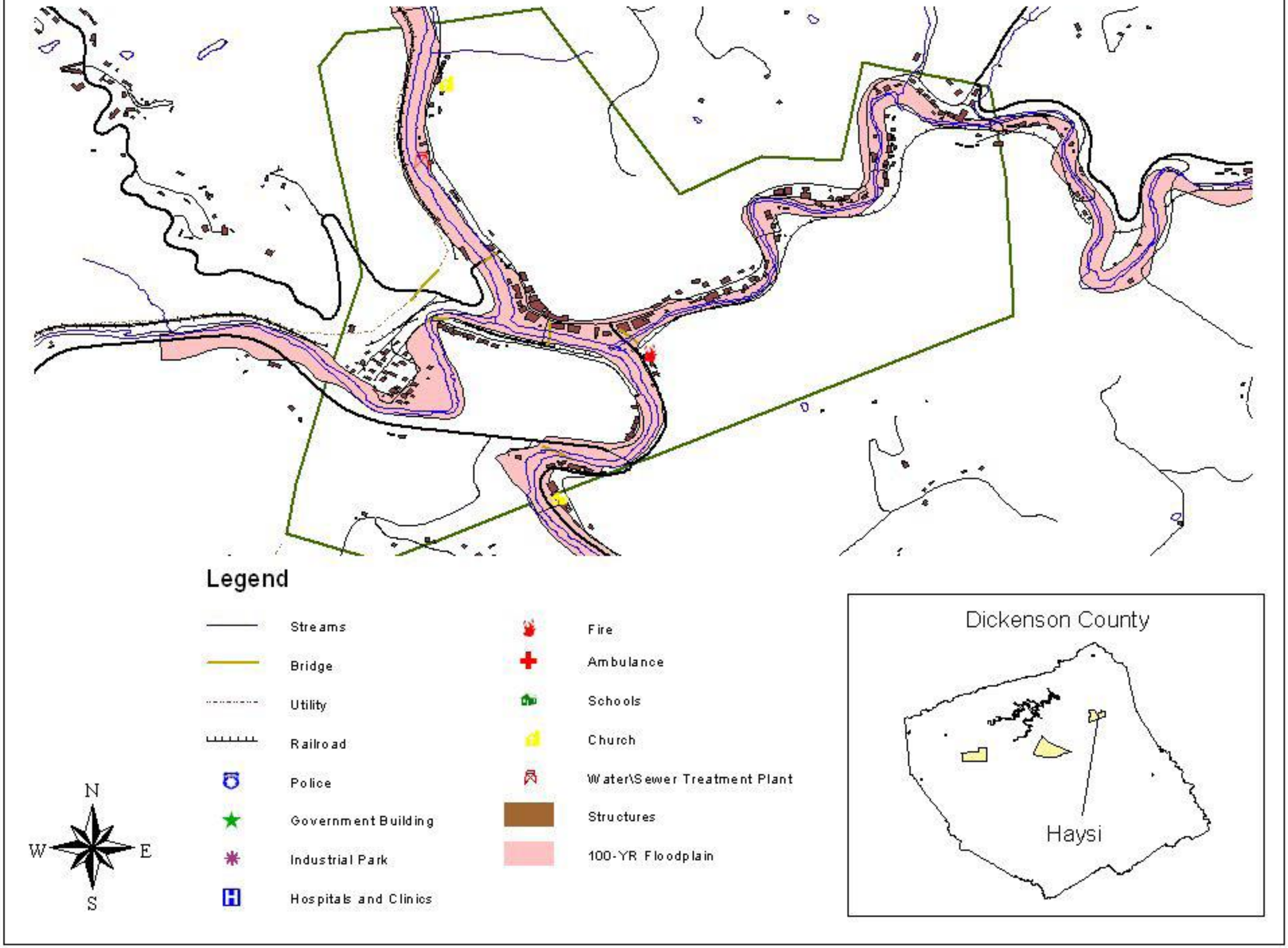
Dickenson County, Virginia Landslide Locations



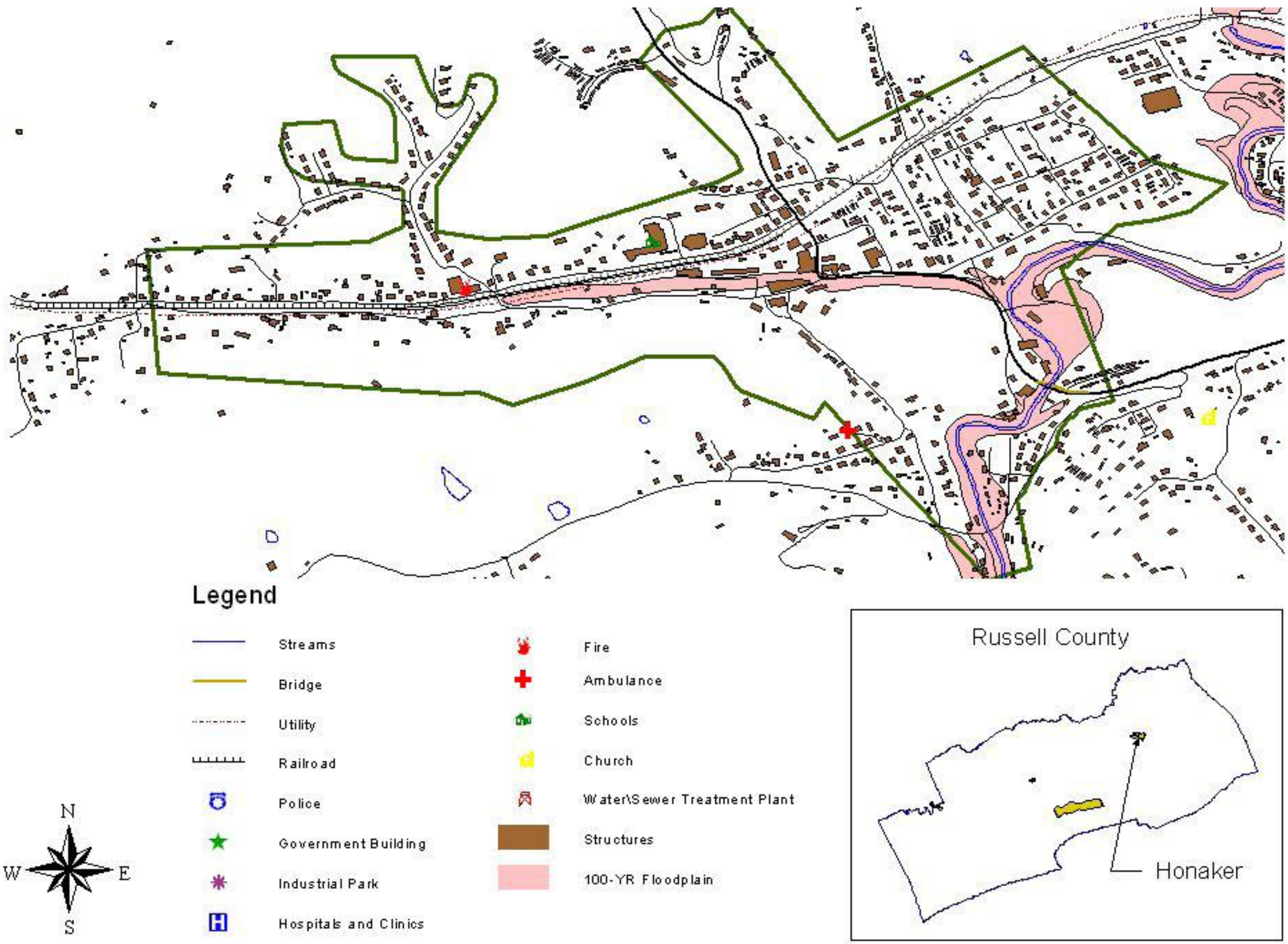
Grundy, Virginia 100-YR Floodplain



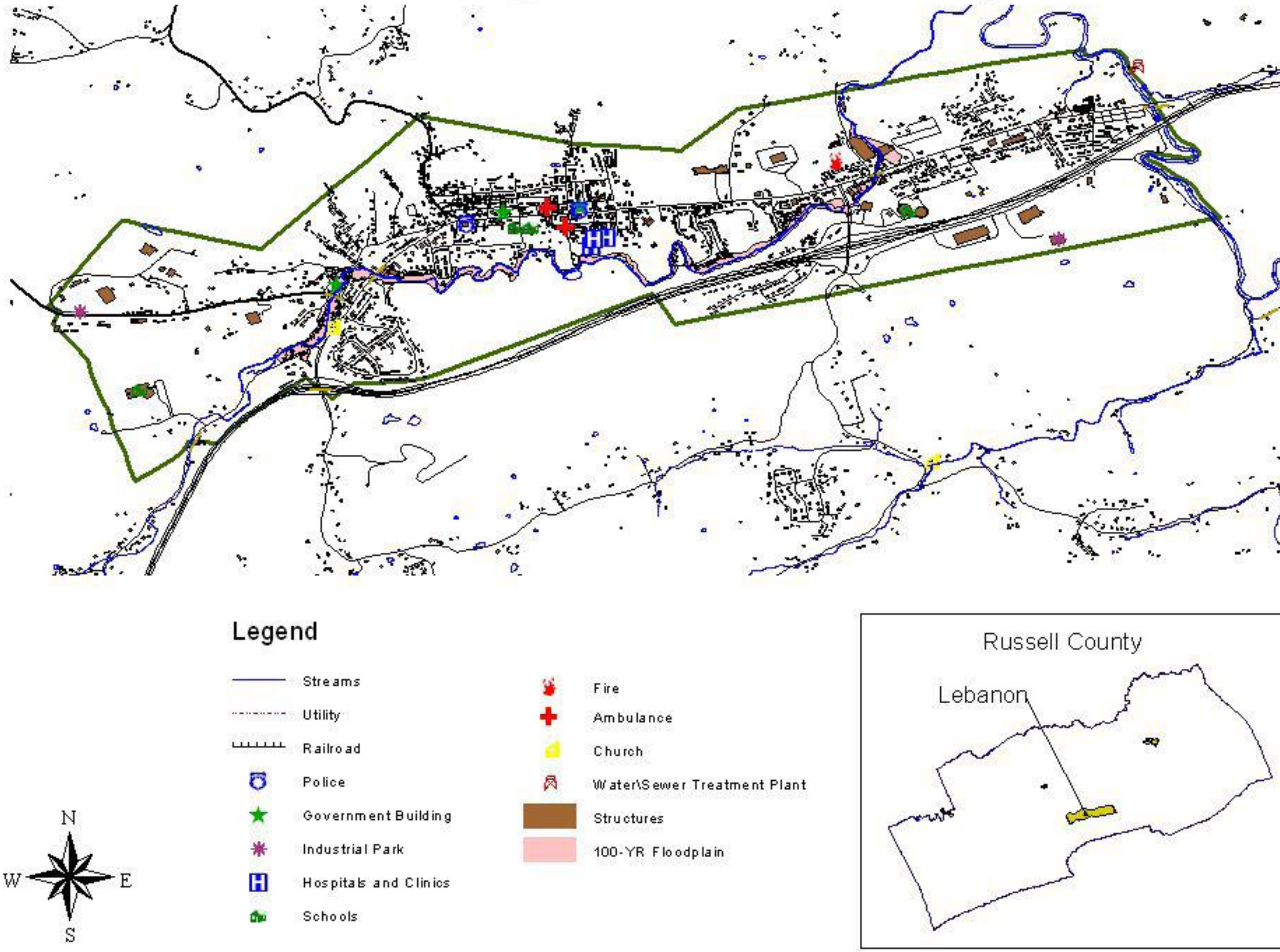
Haysi, Virginia 100-YR Floodplain



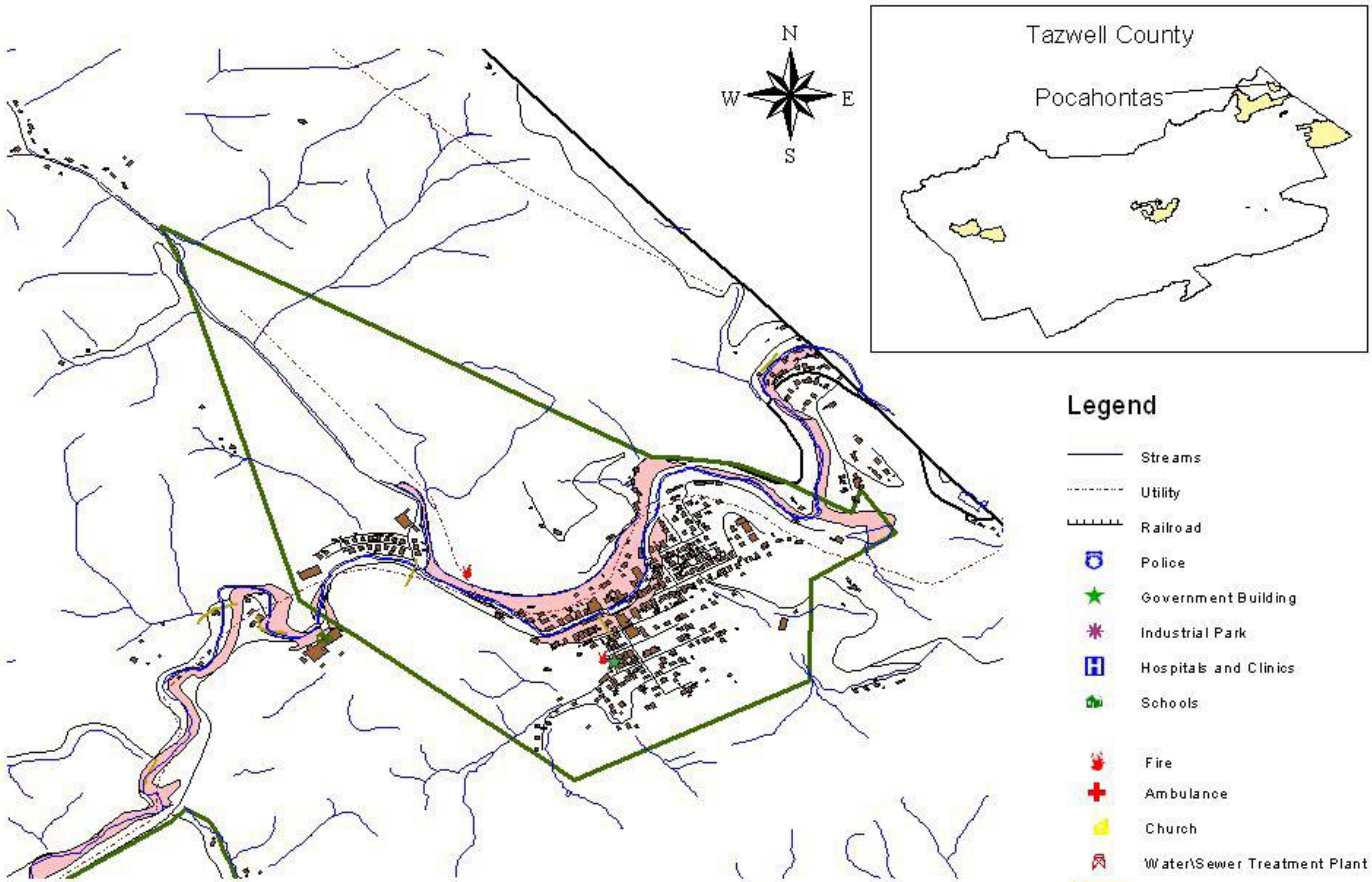
Honaker, Virginia 100-YR Floodplain



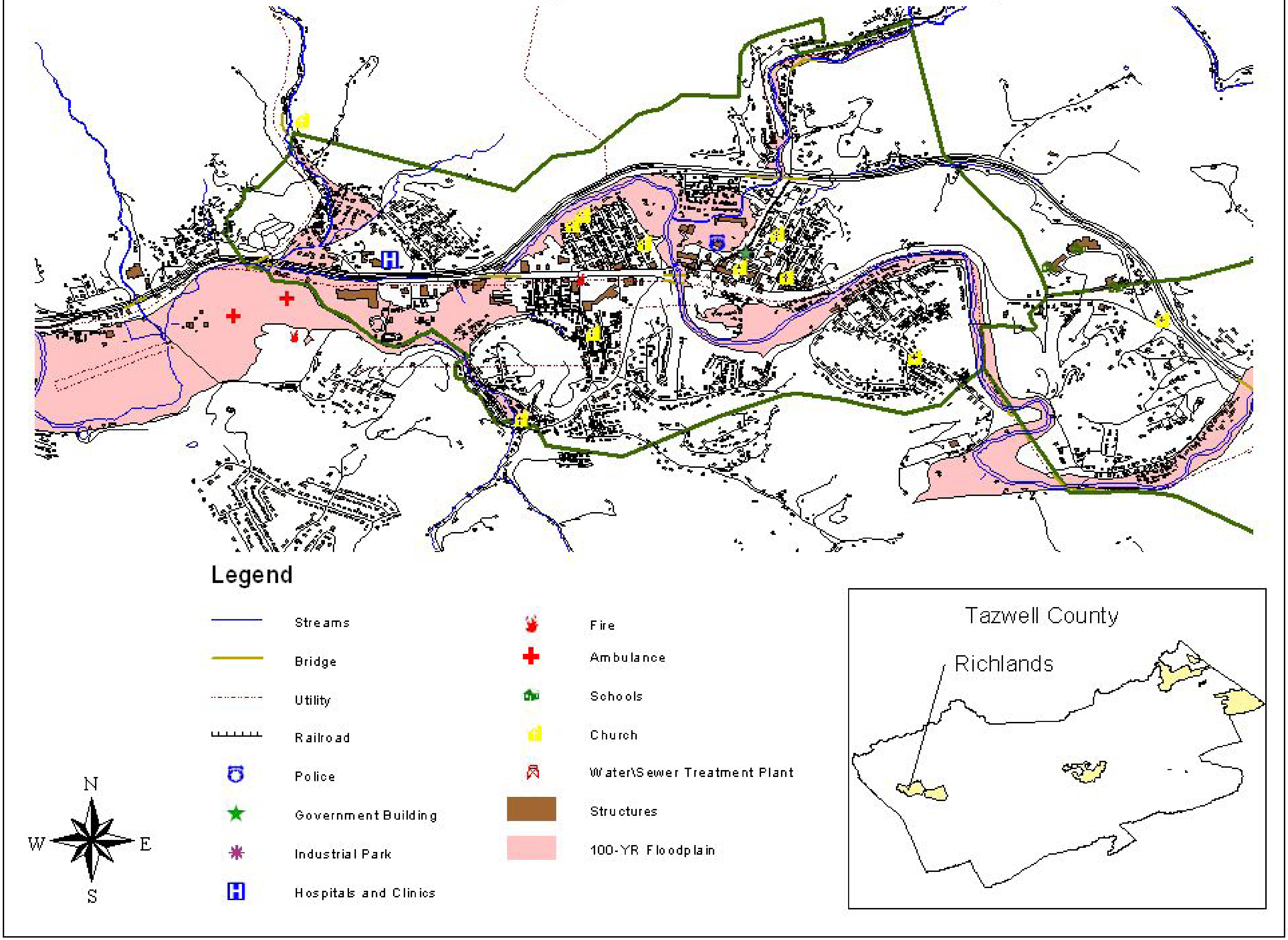
Lebanon, Virginia 100-YR Floodplain

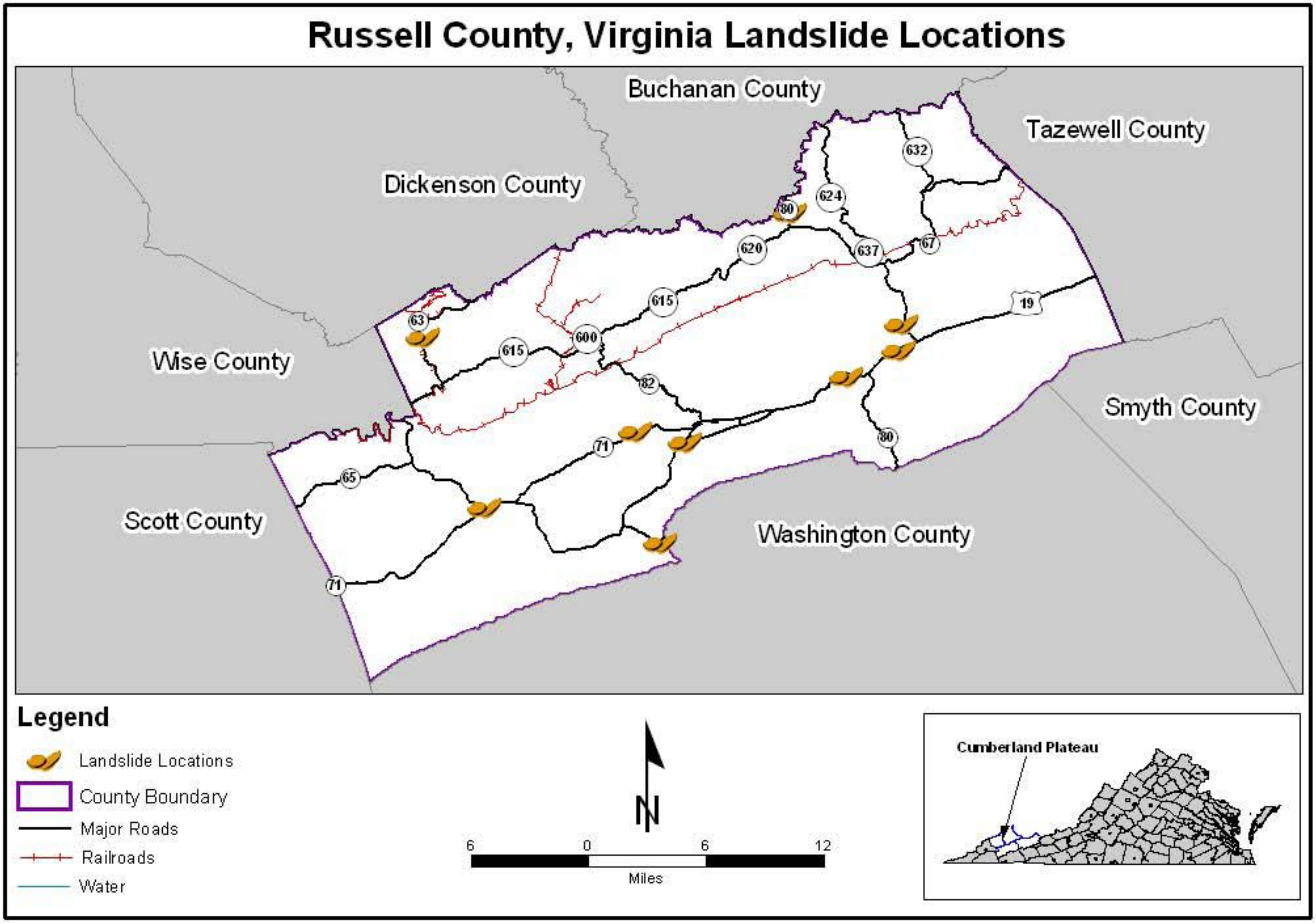


Pocahontas, Virginia 100-YR Floodplain

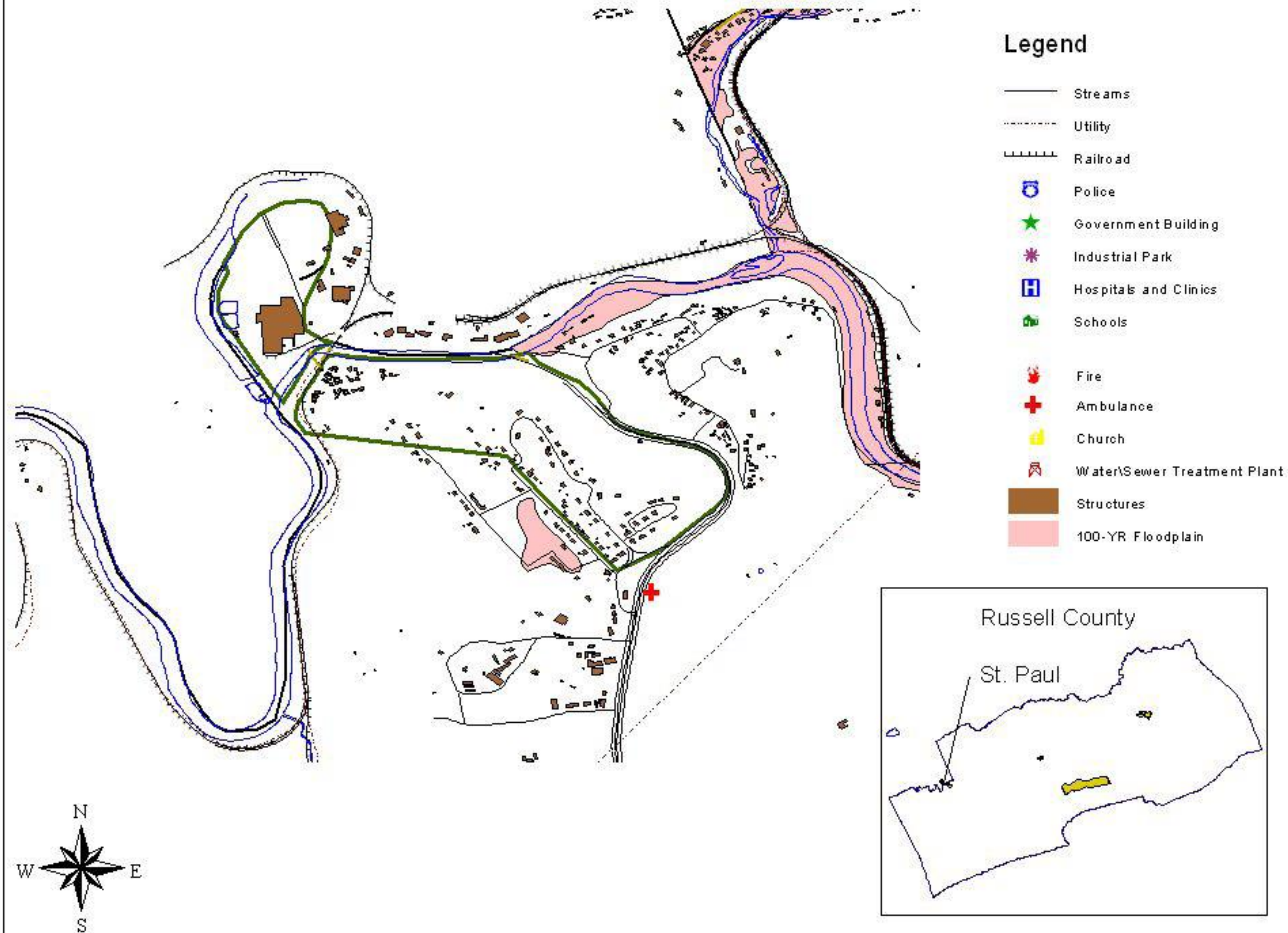


Richlands, Virginia 100-YR Floodplain

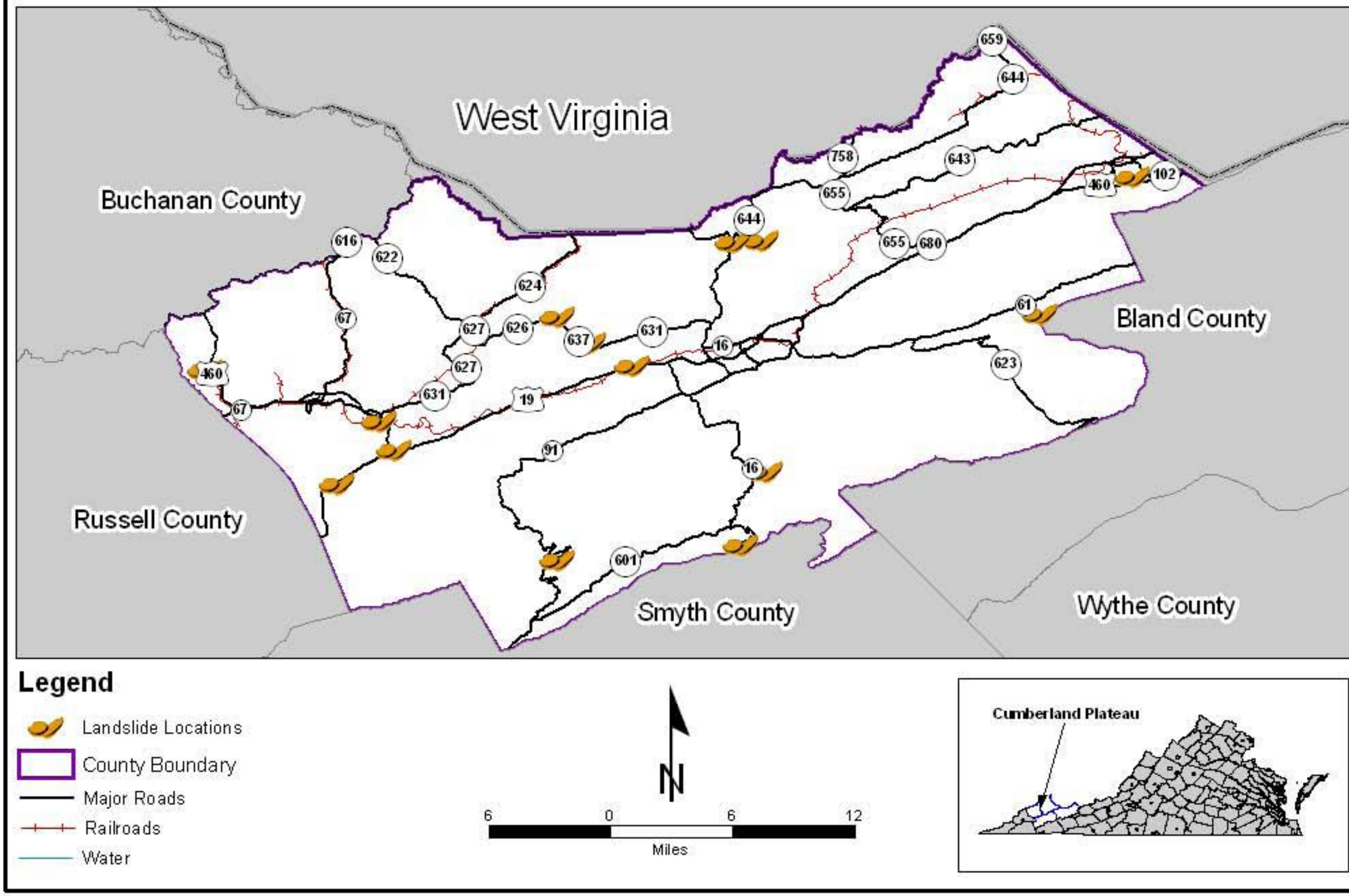



Russell County, Virginia Landslide Locations
Buchanan County
Tazewell County
Dickenson County
Wise County
Smyth County
Scott County
Washington County
632
624
80
620
637
67
615
19
63
615
600
82
71
80
65
71
Legend
Landslide Locations
County Boundary
Major Roads
Railroads
Water
N
6
0
6
12
Miles
Cumberland Plateau

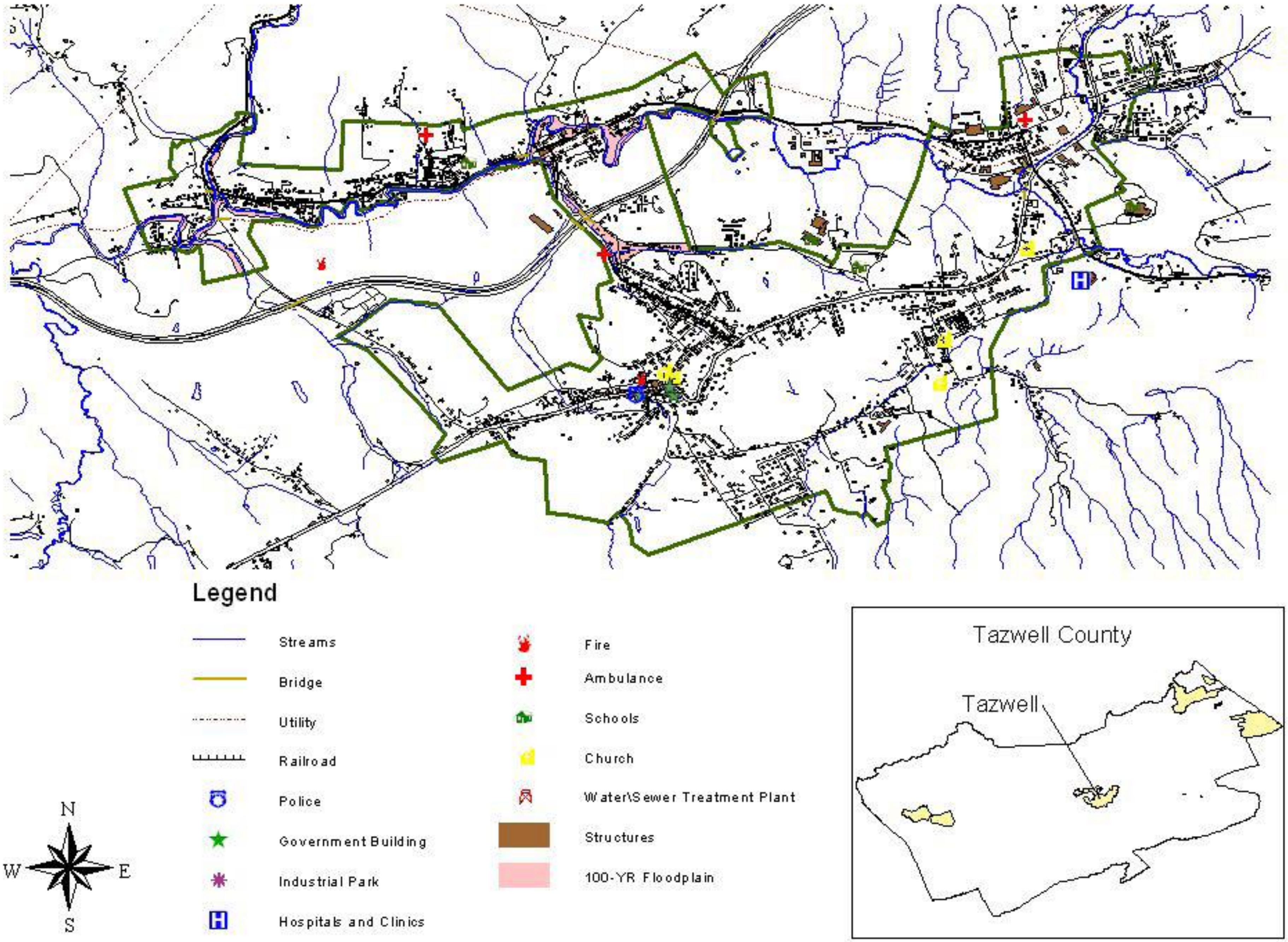
St. Paul, Virginia 100-YR Floodplain



Tazewell County, Virginia Landslide Locations



Tazewell, Virginia 100-YR Floodplain



SECTION VI. CAPABILITY ASSESSMENT

Introduction

This portion of the Plan assesses the Cumberland Plateau Planning District's current capacity to mitigate the effects of the natural hazards identified in Section V of the plan. This assessment includes a comprehensive examination of the following local government capabilities:

1. *Staff and Organizational Capability*
2. *Technical Capability*
3. *Fiscal Capability*
4. *Policy and Program Capability*
5. *Legal Authority*
6. *Political Willpower*

The purpose of conducting the capabilities assessment is to identify potential hazard mitigation opportunities available to the Cumberland Plateau Planning District's local governments including the Counties of Buchanan, Dickenson, Russell and Tazewell. Careful analysis should detect any existing gaps, shortfalls, or weaknesses within existing governmental activities that could exacerbate a community's vulnerability. The assessment also will highlight the positive measures already in place or being done at the County level, which should continue to be supported and enhanced, if possible, through future mitigation efforts.

The capabilities assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals and objectives for the Planning District to pursue under this Plan, but assures that those goals and objectives are realistically achievable under given local conditions.

This section of the plan is divided into four parts, each of which is a brief profile of the capabilities of the participating jurisdictions. The following table summarizes the plans and ordinances of each jurisdiction that can support hazard mitigation goals and strategies.

Table VI-1 — Capability Matrix - Plans and Ordinances

Plan or Ordinance	Buchanan County	Dickenson County	Russell County	Tazewell County
Building Code	X	X	X	X
Capital Improvements Plan or Program				
Comprehensive Land Use Plan	X	X	X	X
Emergency Operations Plan	X	X	X	X
Floodplain		X	X	X

Management Ordinance				
Floodplain Management Plan				
Land Use Regulation				
Local Hazard Mitigation Plan				
Open Space Plan				
Stormwater Management Plan				
Stormwater Ordinance				
Subdivision Ordinance	X	X	X	X
Watershed Protection Plan				
Zoning Ordinance				

Buchanan County

1. Staff and Organizational Capability

Buchanan County has limited staff and organizational capability to implement hazard mitigation strategies. Buchanan County is governed by a seven-member Board of Supervisors. The members represent the seven districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system. There are eight (8) county departments and twenty-nine (29) boards and commissions.

Those professional staff departments and boards are as follows:

- Board Of Election Commissioners
- Legal Department
- Fire Department
- Sheriff's Department
- Public Works Department
- Board Of Building Code Appeals
- Black Diamond R C & D Council
- Coal Haul Road And Gas Improvements Adv. Committee
- Cumberland Mountain Community Service Board
- Cumberland Plateau Planning District
- Cumberland Plateau Regional Waste Management Authority
- Disability Service Board
- Emergency Services
- Finance Committee
- Buchanan General Hospital Board
- Industrial Development Authority
- Insurance Committee
- John Flannagan Water Authority
- Parks And Recreation Board
- Personnel Committee
- Planning Commission
- Buchanan County Public Library
- Public Service Authority
- Buchanan County Public School
- Social Services Advisory Board

- Southwest Virginia Community College Board
- Southwest Virginia Emergency Medical Services Council
- Southwest Virginia Community Corrections Board
- Youth Services Advisory Board

The Board of Supervisors is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Buchanan County Building Code does not maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The Buchanan County Building Code enforces the National Flood Insurance Program requirements and other applicable local codes.

The Buchanan County Coal Haul Road Gas Improvement Department oversees the maintenance of county roadways. The Buchanan County Public Service Authority oversees the sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Buchanan County Emergency Management Department is assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Buchanan County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County does have an inspections office which enforces a building code.

The County does not have a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Buchanan County does currently have GIS capability to further hazard mitigation goals.

2.C. Internet Access

Buchanan County does provide some of its critical employees with high-speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance - a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Buchanan County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2012, the County had a public safety budget of $47,609,000. The County receives most of its revenues through State and Local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Buchanan County.

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Buchanan County.

4.A. Recent Hazard Mitigation Efforts

Buchanan County received emergency funding from the VA Department of Housing in 2002 for major flooding in the Hurley community.

Buchanan County has received these same funds from 2002 to current. In all approximately 100 houses have been removed and replaced or rehabilitated that were damaged during the flooding of 2002. Homes were either moved or built up out of the flood plain in the Hurley area. In all $2,275,000.00 has been received during the Hurley Flood Recovery Projects.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Buchanan County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Buchanan County has developed and adopted a Comprehensive Emergency Management Plan which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Buchanan County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster - which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Buchanan County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Buchanan County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Buchanan County has developed and adopted a Comprehensive Plan in 1994. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Buchanan County has adopted several ordinances that are relevant to hazard mitigation. The following worksheet provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy. For each ordinance, the following should be identified:

Table VI-2 —Buchanan County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Building Construction	7/3/1974	The Building Construction Ordinances controls all matters concerning the construction, alteration, addition, repair, removal, demolition, use, location, occupancy and maintenance of all buildings and all other functions which pertain to the installation of all systems vital to all buildings and structures and their service equipment, as defined by the Virginia Uniform Statewide Building Code.	Moderate
Erosion And Sediment Control	7-7-1998	The purpose is to conserve the land, water, air and other natural resources of Buchanan County. It establishes requirements for the control of erosion and sedimentation, and establishes procedures whereby these requirements shall be administered and enforced.	MODERATE
Flood Damage Prevention Ordinance	3/3/1997	The purpose of the ordinance is to prevent the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief and the impairment of the tax base. The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance,	HIGH

Table VI-2 — Buchanan County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
		which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Land Use	9/3/1996	The Land Use ordinance is intended to guide and facilitate the orderly and beneficial growth of Buchanan County land to promote the public health, safety, convenience comfort, prosperity and general welfare of the county.	MODERATE
Subdivision Ordinance	9/3/1996	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements	MODERATE

Table VI-2 — Buchanan County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
		must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by Terra Tech Inc. to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	

4.H. Open Space Plans

Buchanan County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Buchanan County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) Regulation; (b) Acquisition; (c) Taxation; and (d) Spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia' enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Buchanan County has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Buchanan County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Buchanan County has adopted a building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Buchanan County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Buchanan County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Buchanan County does not have a county wide zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. Buchanan County has adopted a Subdivision Ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Buchanan County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Buchanan County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, and counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Buchanan County proposes to use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Buchanan County does levy property taxes, and uses (preferential tax districts or special assessments) for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Buchanan County has not adopted a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Buchanan County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Dickenson County

1. Staff and Organizational Capability

Dickenson County has limited staff and organizational capability to implement hazard mitigation strategies. Dickenson County is governed by a five (5) member Board of Supervisors. The members represent the five (5) districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Animal Welfare Shelter
- Board of Election Commissioners
- Building Department
- Commissioner of Revenue
- County Employees Credit Union
- Economic Development Department
- Emergency Services & Disaster Agency
- Equal Opportunity Office
- Finance Department
- Fire Department
- Human Resources
- Information Systems
- Industrial Development Authority
- Inspections
- Legal Department
- Planning and Growth Management
- Planning Commission
- Public Works Department
- Sheriff's Office
- Treasurer
- Voters Registration Office

The Department of Emergency Management is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Department of Emergency Management maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The department also enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Works Department oversees the maintenance of city infrastructure including roadways, sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Emergency Management Department and the Sheriff's Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Dickenson County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County has an inspections office which enforces a building code.

The County has a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Dickenson County has existing GIS capability to further hazard mitigation goals.

2.C. Internet Access

Dickenson County provides its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance - a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional and less technical means as well.

3. Fiscal Capability

Dickenson County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2012, the County had a public safety budget of $3,647,242.00. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Dickenson County.

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Dickenson County.

4.A. Recent Hazard Mitigation Efforts

Dickenson County is currently participating in a U.S. Corps of Engineers project to evaluate all structures in the flood plain zone. The school consolidation project is receiving funds through this agreement. Ervinton High, Clinchco Elementary, Sandlick Elementary and some buildings at Haysi High will be demolished and new facilities constructed outside of the floodplain. Between 200 and 300 homes/business are identified as being eligible also.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Dickenson County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Dickenson County has developed and adopted a Comprehensive Emergency Management Plan, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Dickenson County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster - which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Dickenson County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System

(CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

.

4.E. Stormwater Management Plan

Dickenson County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Dickenson County developed and adopted a Comprehensive Plan in 2008. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Dickenson County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-2 — Dickenson County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Flood Damage Prevention and Control Ordinance	1/23/91	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The	HIGH

		County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Subdivision Ordinance	5/28/96	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by (Building Department) to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its	MODERATE

		roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	
Dickenson County State of Emergency Ordinance	(N/A)	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	LOW

4.H. Open Space Plans

Dickenson County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Dickenson County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Dickenson County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Dickenson County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Dickenson County has adopted a building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Dickenson County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Dickenson County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications that control height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Dickenson County does not have a county wide zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. Dickenson County has adopted a subdivision ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Dickenson County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Dickenson County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Dickenson County proposes to use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Dickenson County does levy property taxes, and uses preferential tax districts or special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Dickenson County has not adopted and implemented a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Dickenson County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Russell County

1. Staff and Organizational Capability

Russell County has limited staff and organizational capability to implement hazard mitigation strategies. Russell County is governed by a six (6) member Board of Supervisors. The members represent the five (5) election districts with one supervisor elected at large. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Board of Election Commissioners
- Building Inspections Office
- Economic Development Department
- Emergency Services & Disaster Agency
- Equal Opportunity Office
- Finance Department
- Human Resources
- Information Systems
- Inspections
- Legal Department
- Animal Welfare Shelter
- Fire Department
- Planning Department
- Sheriff's Department
- Public Works Department

The Office Of Emergency Services is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

2. Technical Capability

Russell County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County has an inspections office which enforces a building code.

The County does have a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Russell County has GIS capability to further hazard mitigation goals.

2.C. Internet Access

Russell County provides its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance - a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Russell County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2012, the County had a public safety budget of $4,463,848.00. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Russell County.

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within the Mitigation Strategy for Russell County.

4.A. Recent Hazard Mitigation Efforts

In the past 5 years, Russell County Emergency Management has only completed one mitigation project in Maple Gap. The project replace a failed drained pipe at the lower end of Maple Gap, which caused flooding during heavy rainfall events when the excess water was not allowed to flow through the drain pipe and back up into nearby homes.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Russell County does not participate in the Community Rating System.

4.C Emergency Operations Plan

Russell County has developed and adopted a Comprehensive Emergency Management Plan, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Russell County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster - which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Russell County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Russell County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Russell County has developed and adopted a Comprehensive Plan in 2010. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Russell County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-3 — Russell County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness

Subdivision Ordinance	November 5, 2001	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the Russell County Building Official to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	MODERATE
Floodplain Management Ordinance	March 3, 1988	Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280 of the Code of Virginia. Russell County has adopted a local floodplain ordinance as a requirement of	MODERATE

		participation in the National Flood Insurance Program.	

4.H. Open Space Plans

Russell County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Russell County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan, dated 2000, contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Russell County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Russell County enforces the BOCA building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Russell County has adopted the BOCA building codes and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Russell County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Russell County has established a Planning Department.

5.B.2. Subdivision Ordinance

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 6 acres where no street right-of-way dedication is involved. Russell County has adopted a subdivision ordinance.

5.B.3. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Russell County has not adopted stormwater regulations.

5.B.4. Floodplain Management Ordinance

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Russell County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Russell County proposes to continue using acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development.

Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Russell County does levy property taxes, and uses preferential tax districts or special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Russell County has not adopted a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Russell County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Tazewell County

1. Staff and Organizational Capability

Tazewell County has limited staff and organizational capability to implement hazard mitigation strategies. Tazewell County is governed by a 5 member Board of Supervisors. The members represent the 5 districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Board of Supervisors
- Economic Development Department and Tourism
  - Economic Development
  - Tourism
- Environmental Management and Control
  - Emergency Services
  - County Garage
  - Landfill and Transfer Station
  - Building Inspection
- Grounds and Recreation
  - Janitorial Services
  - Fairgrounds
  - Parks and Recreation
  - Maintenance Services
- Financial Services
  - Accounting and Budgeting
  - Payroll
- Administrative and Human Resources
  - Office Staff
  - CSA
  - Risk Management
- Public Safety and Technology Services
  - Information Technology
  - GIS
  - Communication Technology
  - E-911
  - Special Police (Animal Control)
- Planning and Engineering
- County Attorney

The Emergency Services Coordinator is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Engineering and Planning Department maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The department also enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Service Authority oversees the maintenance of city infrastructure including roadways, sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Engineering and Planning Department, Environmental Services Department, and Public Safety and Technology Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. **Technical Capability**

Tazewell County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County does have an inspections office which enforces a building code.

The County has a person responsible for Information Technology (IT), which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Tazewell County has GIS capability and a person responsible for maintaining/implementing the GIS to further hazard mitigation goals.

2.C. Internet Access

Tazewell County does provide most of its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance - a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Tazewell County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2012, the County had a public safety budget of $85,347,000.. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Tazewell County.

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within the Mitigation Strategy for Tazewell County.

4.A. Recent Hazard Mitigation Efforts

Tazewell County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Tazewell County does not participate in the Community Rating System and has been issued a rating of 10.

4.C. Emergency Operations Plan

Tazewell County has developed and adopted a Comprehensive Emergency Management Plan, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the county to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Tazewell County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster - which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Tazewell County does currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Tazewell County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision and Erosion and Sediment Control regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Tazewell County developed and adopted a Comprehensive Plan in 2008. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Tazewell County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-4 — Tazewell County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Flood Damage Prevention and Control Ordinance	8/17/99 (readopted)	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the	HIGH

		requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Subdivision Ordinance	1/27/1971	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by County Engineer to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions	MODERATE

		by emergency vehicles for fires or severe weather events.	
Tazewell County State of Emergency Ordinance	Unknown	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	LOW
Erosion And Sediment Control		The purpose is to conserve the land, water, air and other natural resources of Tazewell County. It establishes requirements for the control of erosion and sedimentation, and establishes procedures whereby these requirements shall be administered and enforced.	MODERATE

4.H. Open Space Plans

Tazewell County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Tazewell County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation; (b) acquisition; (c) taxation; and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Tazewell County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Tazewell County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Tazewell County has adopted the BOCA building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Tazewell County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Tazewell County has established a Planning Department, which is a part of the Planning and Engineering Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Tazewell County does not enforce a county wide zoning ordinance. The towns of Richlands, Tazewell, Bluefield, and Pochahontas enforce a town zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 5 acres where no street right-of-way dedication is involved. Tazewell County has adopted a subdivision ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Tazewell County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Tazewell County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Tazewell County does not currently use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Tazewell County levies property taxes for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Tazewell County has not adopted and implemented a separate capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Tazewell County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

SECTION VII. MITIGATION STRATEGY

The Mitigation Advisory Committee discussed the results of the hazard identification and risk assessment, review mitigation goals and objectives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy.

This section of the Hazard Mitigation Plan describes the most challenging part of any such planning effort - the development of a mitigation strategy. It is a process of:

1. Setting mitigation goals,
2. Considering mitigation alternatives,
3. Developing objectives and implementation approaches, and
4. Deriving a mitigation action plan.

Essentially these four elements comprise this mitigation strategy.

Setting Mitigation Goals

The hazard mitigation planning process followed by the MAC is a typical problem-solving methodology:

- Describe the problem (Hazard Identification),
- Estimate the impacts the problem could cause (Vulnerability Assessment),
- Assess what safeguards already exist that could/should lessen those impacts (Capability Assessment), and
- Using this information, determine if you should do something (Determine Acceptable Risk), and if so, what that something should be (Develop an Action Plan).

When a community decides that certain risks are unacceptable and that certain mitigation actions may be achievable, the development of *goals* and *actions* takes place. Goals and actions help to describe what should occur, using increasingly more narrow descriptors. Initially, broad-based goals are developed, which are long-term and general statements. Goals are accomplished by implementing actions, which are very detailed and achievable in a finite time period.

The MAC reviewed goals for this plan that were set by the original Hazard Mitigation Plan. General goals remained primarily the same as the initial tone and direction for the overall plan as well. Goals were revisited to confirm that the updated data collection process supported them. Lastly, actions were developed as a logical extension of the plan's objectives. Most of these actions are dynamic and can change. These actions have been utilized to develop a Mitigation Action Plan for the Planning District.

Representatives from Buchanan, Dickenson, Russell and Tazewell Counties, and the towns of Grundy, Clinchco, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell used the results of the data collection efforts to develop goals and prioritize their actions. The priorities differ somewhat from jurisdiction to jurisdiction. Overall, for the entire planning area, protecting new and existing development from the effects of hazards is the top priority because it is can be achieved on an individual community-by-community basis but at the same time be integrated into an overarching plan goal. Each jurisdiction's additional priorities were developed based on past damages, existing exposure to risk, other community goals, and weaknesses identified by the local government capability assessments.

The goals and their associated actions form the basis for the development of a mitigation action plan for implementation to be considered for the Planning District. The Mitigation Action Plan, located at the end of this section, contains recommended mitigation projects.

OVERARCHING COMMUNITY GOAL:
"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."

- ***Goal1:***

  Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.

- ***Goal 2:***

  Protect new and existing public and private infrastructure and critical facilities from the effects of hazards.

- ***Goal 3:***

  Increase the Planning District communities floodplain management activities and participation in the National Flood Insurance Program.

- ***Goal 4:***

  Ensure hazard awareness and risk reduction principles are institutionalized into the Planning District communities' daily activities, processes, and functions by incorporating it into policy documents and initiatives.

- ***Goal 5:***

  Enhance community-wide understanding and awareness of community hazards.

- ***Goal 6:***

  Publicize mitigation activities to reduce the area's vulnerability to hazards.

General Observations — Strengths

- Several of the Planning District's four counties and twelve towns have policies with hazard mitigation elements or effects such as development and building code regulations,floodplain ordinances,zoning ordinances and stormwater management programs. Building code regulations and local enforcement have helped to ensure that new development is built to acceptable safety standards for development overall.
- Much of the language used for flood hazard mitigation is already present in some of the Planning District communities' existing comprehensive plans. These concepts involve floodplain management and the preservation of open space and natural areas.
- Over the next few years, these communities will continue to have opportunities to experience new development within their jurisdictions. Those structures that are built will be constructed built to newer codes and standards that help to reduce damage from natural hazards.
- The jurisdictions within the Planning District have a strong community foundation of mutual assistance and the "help thy neighbor" philosophy.

General Observations — Weaknesses

- Citizens within the Planning District have a historic acceptance of the cycle of damage in the community. Repairing damaged buildings and infrastructure to pre-damaged condition, only to be damaged again during the next event, is common in even the most frequently and severely damaged portions of the planning district.
- While the Planning District communities enforce their floodplain ordinances, some current ordinances could be enhanced to offer further protection to the community and need to be revised. The area's jurisdictions could offer an even greater degree of protection if they adopted cumulative substantial damage and substantial improvement requirements.
- Limited amounts of developable land within the Planning District, and historic lack of public buy-in to mitigation has restricted the number of mitigation options available for some of the most frequently and severely damaged portions of the Planning District.

During the presentation of findings for the hazard identification and risk assessment workshop, the MAC was asked to provide their preliminary input and ideas. Ranges of alternatives were then considered by the MAC based on their comments and suggestions.

Considering Mitigation Alternatives

A wide range of potential mitigation alternatives were considered by the Mitigation Advisory Committee. The actions considered are presented in Appendix C. These actions include those for all hazards identified in the HIRA and include specific structural measures, policy and procedure revisions, and data collection measures. In many cases, actions specific to the community were developed based on the capacity of the communities and the level of data available when making decisions.

Mitigation Actions

In formulating a mitigation strategy, a wide range of activities were considered in order to help achieve the goals and to lessen the vulnerability of the Cumberland Plateau Planning District area to the effects of natural hazards. The original Mitigation Action Plan as well as the updated plan is comprised of proactive mitigation actions designed to reduce or eliminate future losses from natural hazards in the participating jurisdictions.

In addition, the anticipated level of cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural measures, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. Although detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For those measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Cumberland Plateau Planning District Commission Mitigation Actions

The mitigation actions proposed for the Planning District to undertake are listed on the pages that follow. Each has been designed to achieve the goals and objectives identified in this multi-jurisdictional all-hazards mitigation plan. Each proposed action includes:

(1) the appropriate category for the mitigation technique,
(2) the hazard it is designed to mitigate,

(3) the objective(s) it is intended to help achieve,
(4) some general background information,
(5) the priority level for its implementation (high, moderate, or low),
(6) potential funding sources, if applicable,

When formulating a Mitigation Action Plan, a wide range of activities should be considered to help achieve the goals of communities and lessen the vulnerability of the participating jurisdictions to the effects of natural hazards. In general, all of these activities fall into one of the following broad categories of mitigation techniques. Tables VII-8 and VII-9 shows which jurisdictions have chosen to participate in the proposed actions. Appendix C includes the range of alternatives that were considered in by the Mitigation Advisory Committee.

When preparing the 2018 plan update, the four counties' Emergency Managers indicated a need to carry over all previous mitigation actions, since they were unable to complete the actions (mainly due to a lack of funding).

ACTION #1

Obtain official recognition of the Mitigation Advisory Committee by the Planning District's communities in order to help institutionalize and develop an ongoing mitigation program.

Category: Public Information & Awareness
Hazard: All
Goal(s) Addressed: 4
Background: After the passage of the Disaster Mitigation Act of 2000 (DMA2K), local governments are required to develop and to adopt all hazards mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities. Nationwide, many communities have formed committees, councils or citizen groups to assist in developing and implementing plans. In the case of multi-jurisdictional plans, "mitigation advisory committees" are often formed and are comprised of local officials and residents from the participating jurisdictions. One way to assure the effectiveness of such committees is to bestow official status to them. An officially recognized Mitigation Action Committee will aid each community by sharing the workload on regionally beneficial actions and present a unified voice in dealing with state and FEMA officials. **Priority:** High **Funding Sources: N/A Responsibility Assigned to: MAC** and **PDC Target Completion Date:** In progress.

ACTION #2

Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the Planning District for potential mitigation projects.

Category: Property Protection

Hazard: Flood
Goal(s) Addressed: 1, 3
Background: Currently, over 40,000 of the four million properties insured under the National Flood Insurance Program have been identified by FEMA as repetitive loss properties. The known repetitive loss properties are those that have sustained flood damage and received flood insurance claim payments on multiple occasions. Repetitive loss properties, though they represent a minority of the active policies, represent the majority of claims made to the National Flood Insurance Program. In addition to these properties, there are also a number of properties throughout the planning district that are repetitively flooded yet the property owners do not carry flood insurance, so therefore would not appear on FEMA's repetitive loss properties list. Efforts should be made to identify these properties and determine the most effective mitigation approach (e.g., acquisition, relocation, elevation). **Priority:** High
Funding Sources: FEMA's Pre-Disaster Mitigation (PDM) program, Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) program
Responsibility Assigned to: Mitigation Advisory Committee and Planning District Commission **Target Completion Date:** In progress. Some localities are aware of repetitive loss properties. Lack of Funding

ACTION #3

Undertake educational outreach activities by developing and distributing brochures and education materials for FEMA's Repetitive Loss Properties with specific mitigation measures emphasizing acquisition, relocation and elevation.

Category: Public Education and Awareness
Hazard: Flood **Goal(s) Addressed: 3**
Background: The Planning District has several repetitive loss properties which have been identified by FEMA. Although an acquisition program for flood-prone properties has been undertaken in the state previously, local citizens are reluctant to relocate from an area where they have strong family and community ties. Citizens should be educated about the flood loss cycle associated with flood-prone areas and encouraged to work with local government officials to develop mutually agreeable strategies to address repetitive losses in the Planning District.
Priority: High
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC and local emergency management agencies
Target Completion Date: In progress. Educational materials will be made available to the public on websites.

ACTION #4

Publicize the Virginia Department of Forestry's *Money for Mitigation Program.* Utilize existing wildfire maps to prioritize project areas in the Planning District.

Assist local residents, in priority areas, to reduce wildfire hazards through the use of funding from the *Money for Mitigation Program.*

Category: Public Education and Awareness
Hazard: Fire **Goal(s) Addressed: 1**
Background: Financial assistance to reduce fire hazards has been established at the Virginia Department of Forestry. The program provides a 50% cost share funds to reduce wildfire fuels, particularly in wildland-urban interface areas. Citizen's groups and homeowner's associations are eligible applicants. A program description including eligibility criteria can be accessed at the agency's website www.vdof.org.
Priority: High
Funding Sources: Virginia Department of Forestry
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: In progress. Will publicize on website.

ACTION #5

Develop a comprehensive compilation of landslide activity in the Planning District to be used as a planning tool for future infrastructure projects.

Category: Prevention
Hazard: Landslide
Goal(s) Addressed: 2
Background: Landslide activity is prevalent in the mountainous regions of the Planning District. Most often, roadways are impacted by landslide events. The Virginia Department of Transportation and local government road and bridge departments usually respond to events on an as-needed basis. A compilation of landslide activity, both past and present, can assist decision-makers as a planning tool when determining where to cite new and upgraded infrastructure.
Priority: High
Funding Sources: VDOT and local public works departments/agencies
Responsibility Assigned to: MAC, PDC and local public works departments/agencies
Target Completion Date: Not started. Have been unable to obtain this information from localities.

ACTION #6

Evaluate the Planning District's community flood plain ordinances and enforcement procedures that may be outdated for possible upgrades.

Category: Prevention
Hazard: Flood **Goal(s) Addressed: 3**
Background: Each county and community in the planning district has adopted and enforces the NFIP floodplain management regulations. By utilizing the working

relationship established by the formalization of the Mitigation Action Committee communities can share information on the state of current regulations as well as enforcement procedures. By sharing this information communities can learn from one another on ways to best implement, monitor, and enforce NFIP regulations and over all floodplain management. **Priority:** Moderate **Funding Sources: N/A**
Responsibility Assigned to: Planning District communities' floodplain managers
Target Completion Date: In progress.

ACTION #7

Initiate discussion concerning which individuals shall be designated as the Floodplain Manager in each of the four Planning District's jurisdictions. MAC and PDC will make recommendations to the appropriate decision-makers in each jurisdiction.

Category: Prevention
Hazard: All
Goal(s) Addressed: 3
Background: Over nineteen thousand communities participate in the National Flood Insurance Program (NFIP) and have adopted floodplain ordinances that specify the designation of a local floodplain official or administrator. In many cases, the local floodplain administrator is either 1) an individual with little or no experience about flooding and the NFIP, or 2) an individual with many responsibilities. Buchanan, Dickenson, Russell and Tazewell Counties have adopted floodplain ordinances and designated a local floodplain administrator. A review of these individual's responsibilities, not just floodplain administration, can assist local decision-makers in the effective allocation of personnel resources and funding.
Priority: Moderate
Funding Sources: N/A
Responsibility Assigned to: MAC,PDC and local government decision-makers including county commissions.
Target Completion Date: In progress.

ACTION #8

Initiate discussions with public utility companies about incorporating mitigation as infrastructure is laid, maintained, or repaired. Invite utilities to make a presentation to the MAC to begin dialogue.

Category: Prevention
Hazard: All
Goal(s) Addressed: 2

Background: Mitigation initiatives that protect utility infrastructure can most often be installed at the beginning of a project for much less money than if installed as a retrofitting project after the fact. Many utility companies have the financial capacity and desire to protect their facilities from the impacts of natural hazards but are often unaware of the risk until an event occurs. Local governments can serve to educate the companies about the risk of natural hazards and provide technical guidance and references about hazard proofing their facilities.
Priority: High
Funding Sources: FEMA; VDEM, VDC
Responsibility Assigned to: MAC, PDC, local public works departments/agencies, emergency management agencies and area Chambers of Commerce
Target Completion Date: Not started. Low priority of localities.

ACTION #9

Develop and distribute a brochure targeting the Planning District jurisdiction's community staff, which details mitigation principles and options.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 4, 6
Background: Local governmental staff should be educated about the benefits of natural hazard mitigation and encouraged to incorporate the principles into the decision-making processes related to their jobs. Information on potential mitigation measures, as well as potential funding sources and partnering opportunities, should be shared with all appropriate local staff. **Priority:** Moderate
Funding Sources: FEMA, NWS, VDEM, VDC
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: In progress. Website link will be given to local government through PDC website.

ACTION #10

Develop "hazard information centers" on the Planning District's community's websites and in public libraries where individuals can find hazard and mitigation information.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 6
Background: As the Internet continues to become "the information super highway", more local governments around the country are using it as a primary means of official communication with community residents through the development and administration of websites. Today, many residents pay their water and power bills online, register to vote and even obtain driver's licenses over the Internet. Use of local government

websites to educate community residents about natural hazards and mitigation opportunities is growing nationwide.
Priority: Moderate
Funding Sources: Local government annual budgets for information technology
Responsibility Assigned to: Planning District community's local government communications departments/offices, the MAC and PDC.
Target Completion Date: In progress. The four counties will be asked to incorporate info on their websites.

ACTION #11

Investigate the benefits of submitting Community Rating System Applications for non-participating jurisdictions.

Category: Prevention
Hazard: All
Goal(s) Addressed: 3
Background: Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: Class 1 requires the most credit points and gives the largest premium reduction (45%); class 10 receives no premium reduction. Each class, starting with Class 9, receives at least a 5% premium reduction. MAC members should be educated on the benefits of participation of CRS, so that each community may potentially submit a CRS application.
Priority: Medium
Funding Sources: Local government department budgets
Responsibility Assigned to: MAC, PDC, local government planning departments work with the State NFIP Coordinator at the VDC
Target Completion Date: Not started, Lack of funding.

ACTION #12

Investigate all critical facilities to evaluate their resistance to wind, fire, landslide and flood hazards. This study will examine all critical facilities within the Planning District communities and make recommendations as to ways in which the facilities can be strengthened or hardened.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 2
Background: The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. Efforts should be undertaken to ensure that community critical facilities (e.g., fire departments, hospitals, schools) can withstand the impact of various hazards. Local facilities

management offices/agencies and local emergency management agencies will work with the MAC and PDC to undertake a future study with recommendations for improvements. In order to finance this initiative, the MAC and PDC will submit a Pre-Disaster Mitigation (PDM) program grant application to the Virginia Department of Emergency Management.
Priority: Moderate
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC, local facilities management agencies and local emergency management agencies
Target Completion Date: Not started. Lack of funding.

ACTION #13

Support Public Works initiatives to improve stormwater infrastructure throughout the area.

Category: Structural Projects
Hazard: Flood
Goal(s) Addressed: 2, 4
Background: Many times, local stormwater channels are not identified on FEMA Flood Insurance Rates Maps (FIRMs). Consequently, stormwater hazards are often overlooked as natural hazards although they can cause significant problems during times of high water. Many jurisdictions do not regulate stormwater runoff, thereby, increasing flood damage potential during an event.
Priority: Medium
Funding Sources: EPA, USACE, FEMA
Responsibility Assigned to: MAC, PDC and local public works departments
Target Completion Date: In progress. Low priority.

ACTION #14

"Verify the geographic location of all NFIP repetitive losses, and make inquiries as to whether the properties have been mitigated, and if so, by what means."

Category: Prevention
Hazard: Flood
Goal(s): 2
Background: By keeping track of NFIP repetitive losses we can eliminate or reduce damage to properties that are caught in the flood-repair-flood-repair cycle and sustain actions that reduce vulnerability and risk from hazards, or reduce the severity of the effects of hazards on people and property.
Priority: Medium
Funding Sources: Local
Responsibility Assigned to: PDC\MAC
Target Completion Date: In progress.

Table VII-8 — Mitigation Action Item Participation by County				
Action Item	Buchanan County	Dickenson County	Russell County	Tazewell County
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X
4	X	X	X	X
5	X	X	X	X
6	X	X	X	X
7	X	X	X	X
8	X	X	X	X
9	X	X	X	X
10	X	X	X	X
11	X	X	X	X
12	X	X	X	X
13	X	X	X	X

Action Item	Town of Bluefield	Town of Cedar Bluff	Town of Cleveland	Town of Clinchco	Town of Grundy	Town of Haysi	Town of Honaker	Town of Lebanon	Town of Pocahontas	Town of Richlands	Town of Tazewell
1	X	X	X	X	X	X	X	X	X	X	X
2	X		X		X	X		X		X	X
3	X									X	X
4	X									X	X
5											
6											
7											
8											
9	X	X	X	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X	X	X	X
11											
12	X										
13	X					X	X			X	X
	* Contingent upon funding										

Additional Actions

Buchanan County

Locate potential problems within our county.

Category: Prevention, Property Protection
Hazard: Flood, Winter Storm **Goal(s)**
Addressed: 1, 3, 4
Background: The county has streams and rivers that have experienced flooding in the past depending on the amount of precipitation in that area. The County's topography is characterized by hills and valleys. A majority of the lowest-lying areas of the valleys (i.e., the hollows) have not been studied as part of the National Flood Insurance Program mapping initiative.

The County is participating in a long-term flood project in the Town of Grundy, to mitigate the recurrence of flooding in that area. The County plans to continue to identify areas that would benefit from such projects.

Criteria would include proximity to flood source, impact of past and future flooding, number of structures potentially affected, and willingness and capacity of homeowners to participate in mitigation projects. Once the most likely targets for mitigation are determined, specific project development efforts can be undertaken.

Priority: Medium
Funding Sources:
Responsibility Assigned to: Emergency Services Director and Emergency Services Coordinator
Target Completion Date: In progress

Town of Richlands

Continuation of Strict Enforcement of Zoning Regulations

Category: Prevention
Hazard: Flood **Goal(s)**
Addressed: 4
Background: The Town has identified flooding as its most critical hazard based on the past number of flood occurrences, the severity of recent flood incidents, and the physical and monetary amounts of damage resulting from recent flood events. The Town has determined that reasonable mitigation strategies include the continuation of strict enforcement of the Town's Zoning Ordinance to ensure that new structures are not allowed to be constructed/placed within the flood way.

It should be noted that critical infrastructure, such as the water and wastewater facilities and the electrical substation, have already been placed outside of flood zones or have been constructed in a manner to preclude flooding.

Priority: High
Funding Sources: Town operating budget
Responsibility Assigned to: Town Manager
Target Completion Date: Continuous

SECTION VIII — PLAN MAINTENANCE PROCEDURES

The long-term success of the Cumberland Plateau Planning District's mitigation plan depends in large part on routine monitoring, evaluating, and updating of the plan so that it will remain a valid tool for the communities to use. The first step in ensuring that the plan's activities will be implemented is to obtain official recognition of the Mitigation Advisory Committee (MAC) as proposed in Mitigation Action#1 and assign the responsibility to the MAC.

Plan Adoption, Implementation and Maintenance

Formal Plan Adoption

Fifteen local governments in southwestern Virginia have participated in this planning process and formally adopted this plan by resolution of their governing Board. Those local governments are the counties of Buchanan, Dickenson, Russell and Tazewell and the towns of towns of Grundy, Clinchco, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. The plan was completed under the auspices of the Cumberland Plateau Planning District.

The adoption process necessitated that the MAC 1) place the plan review and adoption on the appropriate meeting agendas in each jurisdiction, 2) produce and provide copies in official meeting packets, 3) facilitate the actual adoption, 4) collect the adoption resolutions, and 5) incorporate the adopted resolutions into the final Hazard Mitigation Plan.

The Cumberland Plateau Planning District appreciates the willingness that both Virginia Department of Emergency Management and FEMA Region III demonstrated by reviewing this plan concurrently and providing comments for revision *prior* to the adoption process. Not having done so would clearly have added more months to the adoption process.

Implementation

Upon adoption, the plan faces the biggest test: *implementation.* Implementation implies two concepts: action and priority.

While this plan puts forth many worthwhile and "High" priority recommendations, there may be competition among the participating communities in the Cumberland Plateau Planning District for limited mitigation funds. The decision of which action to undertake first will be the primary issue that the district's communities face. Fortunately, there are two factors that will help make that decision workable. First, there are high priority items for each participating community, so each can pursue an action independently. Therefore, the Plan's specific recommendations will begin to be addressed. Second, funding is always an important and critical issue. Therefore whenever possible, the Planning District communities will pursue low or no-cost recommendations.

An example of a low-cost, high-priority recommendation would be to pursue the education efforts necessary for elected officials and the general public as they relate to participation in the National Flood Insurance Program (NFIP). In other cases, some communities need to strengthen their commitment to the NFIP by amending local floodplain ordinances.

Another example would be to pursue the regional goal of increasing education opportunities for the Planning District communities' employees, MAC representatives, and public officials regarding natural hazard mitigation, floodplain management, floodplain regulations, and enforcement. These initial efforts will lead to long-standing changes in vulnerability and can be initiated at very little cost, while promoting public education through their relative "visibility" in the community.

Another important implementation approach that is highly effective, but low-cost, is to take steps to incorporate the recommendations, and equally important, the underlying principles of this Hazard Mitigation Plan into other community plans and mechanisms, such as:

- Comprehensive Planning
- Capital Improvement Budgeting
- Economic Development Goals and Incentives

Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of government and development. This integration is accomplished by a constant effort to network and to identify and highlight the multi-objective, "win-win" benefits to each program, the communities and their constituents. Just as importantly, the mitigation plan and its recommendations should be presented as a *"framework for mitigation"* in all future planning efforts undertaken by the district's communities such as the development or revision of local comprehensive plans. This effort is achieved through the often tedious actions of monitoring agendas, attending meetings, sending memos, and promoting safe, sustainable communities.

Since 2005 Russell County has incorporated the 2005 mitigation recommendations into their Comprehensive Development Plan. Buchanan, Dickenson, Russell and Tazewell Counties have incorporated it into their Local Emergency Operations Plans. The PDC will continue to stress the need to integrate with other local community plans.

Simultaneous to these efforts, it will be important to constantly monitor funding opportunities that can be utilized to implement some of the higher cost recommended actions. This will include creating and maintaining a repository of ideas on how any required local match or participation requirement can be met. Then, when funding does become available, the Cumberland Plateau Planning District communities will be in a position to take advantage of an opportunity. Funding opportunities that can be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal ear-marked funds, and grant programs, including those that can serve or support multi-objective applications.

With adoption of this plan, the Cumberland Plateau Planning District communities commit to:

- Pursuing the implementation of the high-priority, low/no-cost recommended actions.
- Keeping the concept of mitigation in the forefront of community decision-making by identifying and stressing the recommendations of the Hazard Mitigation Plan when other community goals, plans and activities are discussed and decided upon.
- Maintaining a constant monitoring of multi-objective, cost-share opportunities to assist the participating communities in implementing the recommended actions of this plan for which no current funding or support exists.

Maintenance

Plan maintenance requires an ongoing effort to monitor and evaluate the implementation of the plan, and to update the plan as progress, roadblocks, or changing circumstances are recognized.

This monitoring and updating will take place through:

1. An annual review by each Cumberland Plateau Planning District community,
2. An annual review through the Mitigation Advisory Committee, and
3. A 5-year written update to be submitted to the state and FEMA Region III, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame.

   CPPDC employee Charlie Perkins will monitor, evaluate, and update the plan between 5-year written updates (2018-2023).

When each community convenes for a review, they will coordinate with each of the other jurisdictions that participated in the planning process - or that has joined the planning group since the inception of the planning process - to update and revise the plan. Public notice will be given and public participation will be invited, at a minimum, through available web postings and press releases to the local media outlets, primarily newspapers and radio stations.

The evaluation of the progress can be achieved by monitoring changes in the vulnerability identified in the plan. Changes in vulnerability can be identified by noting:

- Lessened vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or,
- Increased vulnerability as a result of new development (and/or annexation).

The updating of the plan will be by written changes and submissions, as the Cumberland Plateau Planning District communities and Mitigation Advisory Committee deem appropriate and necessary.

IX. REFERENCES

In addition to the general body of literature on hazard vulnerability and hazard mitigation, the following reports and data were reviewed and used during this study:

City of Chesapeake, Virginia, Natural Hazards Mitigation Plan, 2003-2008, by City of Chesapeake, VA and Dewberry & Davis LLC, September 2003.

City of Conway, South Carolina Flood Hazard Mitigation Plan, February 16, 2000, by French & Associates, Ltd. Park Forest, Illinois.

Flood Mitigation Plan for Lewes, Delaware, September 1999, by Greenhorne & O'Mara, Inc.,9001 Edmonston Road, Greenbelt, MD 20770.

Heart of Illinois Project Impact Natural Hazards Mitigation Plan, April 12, 2004 by Dewberry, 8401 Arlington Blvd., Fairfax, VA 220311-4666.

Hyde County, North Carolina, Multi-Hazard Mitigation Plan, 2003, by Hyde County, NC.

Northeast Colorado All Hazards Mitigation Plan, December 2003 by Northeast Colorado Emergency Management Association and Mitigation Assistance Corporation.

HIRA references

All about Bluefield

Buchanan County VA *Comprehensive Plan*

Cumberland Plateau PDC, *Comprehensive Economic Development Strategy*

Dickenson County VA *Comprehensive Plan*

Federal Emergency Management Agency , *Engineering Principles and Practices of Retrofitting Floodprone Residential Structures* (FEMA 259, 1995)

Federal Emergency Management Agency, *Understanding Your Risks: Identifying hazards and estimating losses* (FEMA 386-2, 2001)

National Earthquake Information Center

National Climatic Data Center, National Oceanic and Atmospheric Administration

Personal communication with Virginia Department of Transportation

Tazewell County VA *Comprehensive Plan*

Tennessee Valley Authority reports (1964, 1971)

Upper Tennessee River Watershed Conservation Roundtable, *Upper Tennessee River Watershed Strategic Plan*

Virginia State Water Control Board report (1977)

Virginia Uniform Statewide Building Code

VA Department of Forestry, *Wildfire Risk Assessment (WRA) - 2003*

Work Plan for Upper Clinch Valley Watershed

United States Corp of Army Engineers report (1971)

United States Geological Survey, Flood Gauge Data

APPENDIX A — DETAILED HAZARD IDENTIFICATION PARAMETERS AND METHODOLOGY

Based on all local and regional hazard data collected, an analysis of the potential hazards that can affect the Cumberland Plateau Planning area was performed based on the four parameters that are described below. These four parameters were based on two separate factors — *the probabilities that a potential hazard will affect the area and the potential impacts on the city should a hazard event occur.* Hazard identification parameters and computations used to prioritize the potential hazards that can threaten the Cumberland Plateau planning area are listed in tabular form at the end of this appendix.

Probability — This parameter addresses the probability that a potential hazard will affect the planning area. The probability for each hazard was determined based on the history of events in the planning area, as well as any other relevant available data. Hazard probabilities were classified into one of four distinct categories by estimating the hazard's average annual frequency, which is the probability of a specific hazard event occurring in the planning area in a given year.

Affected Area — This parameter is the first of three impact parameters, and addresses the potentially affected geographic area within the planning area should a hazard event occur. The extent of the affected area for each hazard was determined based on the specific characteristics of each hazard, the history of such events within the Cumberland Plateau planning area, and experience with similar events that have occurred near the area. The affected areas were classified into one of four distinct categories based on the extent of the planning area that would be directly impacted by the hazard, ranging from a single building or facility to a widespread area of the planning area.

Primary Impact — This second impact parameter addresses the potential direct damages to buildings, facilities, and individuals should a hazard event occur. The primary impact was determined based on the specific characteristics of each hazard, the history of such events in the Cumberland Plateau planning area, and experience with similar events that have occurred in the region. Primary impacts were classified into one of four distinct categories by estimating the typical damage to a city building or facility from a given hazard, ranging from negligible (less than 10% damage) to catastrophic (greater than 50% damage).

Secondary Impacts — This third impact parameter addresses the potential secondary impacts on the planning area should a hazard event occur. Note that while primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road closures due to submerged pavement; while a secondary impact could be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure. Other examples of secondary impacts include loss of building or facility services (functional downtime), power outages, and mass evacuation of city residents. The secondary impacts were determined based on the specific characteristics of each hazard, the history of such events in the planning area, and experience with similar events in the region. Secondary impacts were classified into one of four distinct categories by estimating the typical impacts to the city at large from a given hazard, ranging from negligible (no loss of function, downtime, and/or evacuations) to high (major loss of function, downtime, and/or evacuations).

Once these parameters were determined, a preference scale was utilized to arrive at a hazard level for each of the hazard types considered for the planning area. The preference scale method has been used as a means of quantifying hazard assessment results in other communities, and similar scales were developed to rank alternatives in other FEMA documents such as FEMA Publication 259. The preference scale used for this hazard analysis first assigned a numerical value between 1 and 4 to each parameter, with 1 representing the lowest hazard potential and 4 being the highest. These numerical values were then modified by weighing each parameter by a factor to reflect the overall importance of that parameter, with 0.5 representing parameters of lowest importance and 2.0 representing parameters of highest importance. Importance factors may also be adjusted to reflect the level of confidence with the information supplied for a given parameter. For this reason, probability parameters were assigned a factor of 2.0 to reflect their high importance and the generally high confidence in the available information. However, the affected area, primary impact and secondary impacts parameter were assigned factors of 0.8, 0.7 and 0.5 to reflect their lower importance and the low confidence in the available information. Finally, the factored values assigned to the various parameters for each hazard were totaled, and the hazard types with the highest totals were considered the highest potential hazard level.

In order to quantify these hazard parameters, the following formula was developed to assign a value for probability and impact for each of the hazards considered.

Hazard Level = Probability x Impacts

Where: Probability = (Probability score x Importance factor)

Impacts = (Affected Area + Primary Impact + Secondary Impacts)

Affected Area = Affected Area score x Importance factor

Primary Impact = Primary Impact score x Importance factor

Secondary Impact = Secondary Impact score x Importance factor

The preference scale computations used to determine the hazard level for each of the potential hazards impacting the Cumberland Plateau planning area are summarized in tabular form at the end of this appendix. The hazard levels are broken down into four distinct categories that represent the likelihood of a hazard event of that type significantly impacting the planning area: High, Medium-High, Medium, and Low. Note that the assigning of numerical values and importance factors for parameters is qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, a margin or error of +10 percent was assumed for the total scores used to arrive at the hazard level values.

Hazard Type	Probability	Impacts			Total Score	Hazard Level
		Affected Area	Primary Impact	Secondary Impacts		
SEVERE WINTER STORM	6	3.2	1.4	1.5	37	Medium-High
DROUGHT	4	3.2	0.7	1	20	Medium
EARTHQUAKE	4	3.2	1.4	1	22	Medium
WILDFIRE	8	2.4	2.1	0.5	40	Medium-High
FLOOD	8	2.4	2.1	2	52	High
EXTREME HEAT	2	3.2	0.7	0.5	9	Low
LANDSLIDES	8	1.6	2.1	1	38	Medium-High
SEVERE THNDERSTORM / HAIL STORM	8	1.6	0.7	0.5	22	Medium
DAM/LEVEE FAILURE	2	1.6	2.8	2	13	Medium
TORNADO	2	1.6	2.1	1	9	Low
SEVERE WIND	6	3.2	1.4	1.5	37	Medium-High
KARST	2	0.8	0.7	0.5	4	Low
ALGAE BLOOM	4	2.4	1.4	1.5	22	Medium
DOMESTIC FIRE	4	0.8	2.1	0.5	14	Medium
ABANDONED MINE FIRE / FLOOD	2	2.4	2.1	2	13	Medium

Total Score = Probability x Impact, where:
Probability = (Probability Score x Importance)
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:
Affected Area = Affected Area Score x Importance Primary
Impact = Primary Impact Score x Importance Secondary
Impacts = Secondary Impacts Score x Importance

Hazard Level Total Score	(Range)	Hazard Level	Distribution
0.0	12.0	Low	2
12.1	28.0	Medium	4
28.1	48.0	Medium-High	3
48.1	64.0	High	1

The probability of each hazard is determined by assigning a level, from 1 to 4, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. These levels are then multiplied by an importance factor to obtain a score for each category. The probability score is multiplied by the sum of the three impact categories to determine the total score for the hazard. Based on this total score, the hazards will be separated into four categories based on the hazard level they pose to the planning area: high, medium-high, medium, low.

Probability Importance 2.0

Based on average annual frequency of occurrence estimated from historical data

Level	Average Annual Frequency	Score
1	Unlikely (less than 1 % occurrence)	2
2	Possible (between 1% and 10% occurrence)	4
3	Likely (between 10% and 100% occurrence)	6
4	Highly likely (near 100% occurrence)	8

Affected Area Importance 0.8

Based on size of geographical area of community affected by hazard

Level	Affected Area	Score
1	Isolated - limited to one building/facility	0.8
2	Small - limited to a handful of buildings/facilities	1.6
3	Medium - affecting a portion of an area	2.4
4	Large - affecting a widespread area	3.2

Primary Impact Importance 0.7

Based on percentage of damage to typical facility in community

Level	Impact	Score
1	Negligible - less than 10% damage	0.7
2	Limited - between 10% and 25% damage	1.4
3	Critical - between 25% and 50% damage	2.1
4	Catastrophic - more than 50% damage	2.8

Secondary Impacts Importance 0.5

Based on estimated secondary impacts to community at large

Level	Impact	Score
1	Negligible - no loss of function, downtime, and/or evacuatio	0.5
2	Limited - minimal loss of function, downtime, and/or evacua	1
3	Moderate - some loss of function, downtime, and/or evacua	1.5
4	High - major loss of function, downtime, and/or evacuations	2

NOTE:
Total Score values assume a margin of error of + 10 percent. 0.5

65 events were reported in **Buchanan County, Virginia** between **05/01/2011 and 04/30/2018 (High wind limited to speed greater than 0 knots)**.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					1	0	1.438M	0.00K
GRUNDY	05/10/2011	20:30	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
VANSANT	05/22/2011	16:05	Hail	0.88 in.	0	0	0.00K	0.00K
GRUNDY	05/24/2011	08:53	Hail	1.25 in.	0	0	5.00K	0.00K
GRUNDY	06/11/2011	17:34	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
GRUNDY	06/11/2011	17:35	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
GRUNDY	07/04/2011	12:24	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
BUCHANAN (ZONE)	01/02/2012	16:00	Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)	01/14/2012	18:00	Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)	02/19/2012	10:00	Heavy Snow		0	0	100.00K	0.00K
HURLEY	06/29/2012	19:20	Thunderstorm Wind	50 kts. EG	0	0	250.00K	0.00K
HURLEY	06/30/2012	17:05	Hail	1.00 in.	0	0	0.00K	0.00K
HURLEY	06/30/2012	17:35	Hail	1.00 in.	0	0	0.00K	0.00K
GRUNDY	07/01/2012	09:12	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
GRUNDY	07/05/2012	13:20	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
OAKWOOD	07/05/2012	13:25	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
DAVENPORT	07/05/2012	13:35	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
BIG ROCK	07/25/2012	00:18	Flash Flood		0	0	10.00K	0.00K
PAW PAW	07/31/2012	17:00	Flash Flood		0	0	100.00K	0.00K
BUCHANAN (ZONE)	10/29/2012	11:00	Heavy Snow		0	0	250.00K	0.00K
BUCHANAN (ZONE)	01/17/2013	11:30	Heavy Snow		0	0	0.00K	0.00K
ROWE	01/30/2013	18:30	Flood		0	0	1.00K	0.00K
BUCHANAN (ZONE)	03/25/2013	06:00	Winter Weather		0	0	0.00K	0.00K
BREAKS	05/20/2013	10:00	Flash Flood		0	0	200.00K	0.00K
JANEY	07/17/2013	18:35	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
VANSANT	09/02/2013	18:30	Flash Flood		0	0	10.00K	0.00K
BUCHANAN (ZONE)	01/06/2014	16:00	Extreme Cold/wind Chill		0	0	50.00K	0.00K
BUCHANAN (ZONE)	01/25/2014	09:00	Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)	01/28/2014	19:00	Cold/wind Chill		0	0	10.00K	0.00K
BUCHANAN (ZONE)	02/12/2014	15:00	Heavy Snow		0	0	0.00K	0.00K

BUCHANAN (ZONE)			03/03/2014	01:00		Winter Storm		0	0	0.00K	0.00K
BUCHANAN (ZONE)			03/12/2014	13:00		Strong Wind	40 kts. EG	0	0	25.00K	0.00K
BUCHANAN (ZONE)			03/12/2014	19:00		Winter Weather		0	0	0.00K	0.00K
ROWE			04/28/2014	15:43		Thunderstorm Wind	55 kts. MG	0	0	0.00K	0.00K
HURLEY			06/05/2014	02:00		Flash Flood		0	0	200.00K	0.00K
HURLEY			06/11/2014	23:30		Flash Flood		0	0	2.00K	0.00K
BUCHANAN (ZONE)			11/01/2014	00:01		Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/14/2015	14:00		Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/14/2015	23:00		Cold/wind Chill		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/16/2015	07:30		Heavy Snow		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/18/2015	22:00		Extreme Cold/wind Chill		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/21/2015	03:00		Winter Storm		0	0	20.00K	0.00K
BUCHANAN (ZONE)			02/25/2015	22:00		Winter Weather		0	0	0.00K	0.00K
DAVENPORT			03/04/2015	17:00		Flood		1	0	50.00K	0.00K
BUCHANAN (ZONE)			03/05/2015	04:30		Heavy Snow		0	0	0.00K	0.00K
GRUNDY			06/18/2015	17:40		Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
DWIGHT			06/18/2015	18:10		Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
JEWELL VLY			07/14/2015	04:40		Flash Flood		0	0	20.00K	0.00K
BUCHANAN (ZONE)			01/22/2016	05:00		Heavy Snow		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/14/2016	16:15		Heavy Snow		0	0	0.00K	0.00K
PAW PAW			05/01/2016	18:35		Hail	1.00 in.	0	0	0.00K	0.00K
GRUNDY			06/16/2016	19:01		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HARMON			06/23/2016	19:01		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MT HERON			06/23/2016	19:20		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HURLEY			07/04/2016	18:36		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
PRATER			07/04/2016	18:40		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
DESKINS			07/06/2016	19:00		Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
BREAKS			04/23/2017	14:00		Flood		0	0	15.00K	0.00K
BUCHANAN (ZONE)			11/18/2017	11:00		Strong Wind	35 kts. EG	0	0	10.00K	0.00K
BUCHANAN (ZONE)			01/29/2018	19:00		Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)			02/01/2018	20:00		Winter Weather		0	0	0.00K	0.00K
BREAKS			02/10/2018	17:00		Flood		0	0	0.00K	0.00K

BUCHANAN (ZONE)			03/24/2018	05:00		Winter Weather		0	0	0.00K	0.00K
BUCHANAN (ZONE)			03/24/2018	05:00		Winter Weather		0	0	30.00K	0.00K
GRUNDY			04/04/2018	01:10		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
WHITEWOOD			04/04/2018	01:24		Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
Totals:								1	0	1.438M	0.00K

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-05-10 20:30 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2011-05-10 20:30 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Repetitive showers and thunderstorms dropped southeast from southern Ohio, eastern Kentucky and western West Virginia into Virginia. The convection was along a warm frontal boundary.
Event Narrative Trees fell onto power lines. Electrical outages occurred.

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-22 16:05 EST-5
Begin Location 0N VANSANT
Begin Lat/Lon 37.23/-82.1
End Date 2011-05-22 16:05 EST-5
End Location 0N VANSANT
End Lat/Lon 37.23/-82.1
Deaths Direct/Indirect 0/0
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed in the afternoon instability. A moist southwest flow existed, well in advance of an approaching cold front.

Event Hail
Magnitude 1.25 in.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-24 08:53 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2011-05-24 08:53 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A disturbance in the winds aloft helped trigger a round of morning convection. The storms moved into Virginia from eastern Kentucky.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2011-06-11 17:34 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2011-06-11 17:34 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative The area was in the warm and moist summer air, well south of a front in the Midwest. In the heat of the late afternoon, a few thunderstorms moved out of eastern Kentucky into Virginia.
Event Narrative Trees were blown down. A tool shed was knocked over.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Law Enforcement
NCEI Data Source CSV

Begin Date 2011-06-11 17:35 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2011-06-11 17:35 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative The area was in the warm and moist summer air, well south of a front in the Midwest. In the heat of the late afternoon, a few thunderstorms moved out of eastern Kentucky into Virginia.
Event Narrative Trees were blown down across roads.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-07-04 12:24 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2011-07-04 12:24 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative A moist and unstable environment was aided by daytime heating to create afternoon thunderstorms. One of the thunderstorms became severe in Buchanan County. The convection developed into a bow echo as it pushed northeast into McDowell and Wyoming Counties of southern West Virginia.
Event Narrative Trees were blown down on roads.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-01-02 16:00 EST-5
End Date 2012-01-03 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K

Crop Damage 0.00K
Episode Narrative Much colder air arrived on the 2nd. Snow showers were common from late afternoon through the overnight hours. Snow accumulations of 2 to 4 inches were common by dawn on the 3rd.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-01-14 18:00 EST-5
End Date 2012-01-15 04:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A clipper system deposited 2 to 3 inches of snow during the overnight period.
Event Narrative

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-02-19 10:00 EST-5
End Date 2012-02-19 22:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 100.00K
Crop Damage 0.00K
Episode Narrative As a surface low pressure system was moving east, off the southeast coast of the United States, its mid and upper level system was lifting out of the Tennessee Valley on Sunday, the 19th. Intermittent light rain and snow began after dawn. The cooling aloft and the deeper moisture associated with the comma head signature on satellite imagery moved through during the afternoon. As a result, wet snow became steady after 1200E. The snow fell at a rate of around an inch per hour during much of the afternoon. With the warm ground, and air temperatures at or slightly above freezing in the valleys, a highly elevation dependent accumulation was seen. Snow accumulations of 3 to 8 inches were common. The snow ended during the evening.
Trees or tree branches came down on overhead wires. Other wires sagged due to the weight of the snow. Roughly 4000 customers were without electricity in the 2 counties.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-06-29 19:20 EST-5
Begin Location 0N HURLEY
Begin Lat/Lon 37.42/-82.03
End Date 2012-06-29 19:50 EST-5
End Location 0N COUNCIL
End Lat/Lon 37.08/-82.07
Deaths Direct/Indirect 0/0
Injuries Direct/Indirect 0/0
Property Damage 250.00K
Crop Damage 0.00K
Episode Narrative On the second day of a developing heat wave, under a sunny sky, afternoon temperatures reached well into the 90s. Both Clintwood and Nora had 97 degrees. The 97 degrees at Clintwood was the hottest temperature on record there.
Meanwhile, an area of multi-cellular convection had moved out of northern Illinois that morning. It continued to organize and strengthen, as it propagated east and southeast across northern Indiana into western Ohio during the afternoon. As it moved through Ohio, it had already formed into a large arch of storms, or bow, with a developing cool pool in its wake. The temperature contrast between the air ahead of the developing derecho, compared to that in its wake was reaching 30 to 35 degrees. The resultant wind shift in the cool pool resulted in strong moisture convergence on the leading edge of the complex. This in turn, helped drive the storms further southeast, away from the mid and upper level wind support. However, the complex was diving right into that hot air that had obtained large convective available potential energy, on the order of 4000 to 5000 j/kg.
The weakening complex reaching into Buchanan County around 1900E. The outflow, or gust front, had outraced the rain.
Wind gusts of 55 to 65 mph were likely with the leading gust front. In the wake of these stronger winds gust, many areas did not even receive any rain. Grundy reported a meager 0.03 inches. Clintwood and Nora had no rain.
The wind caused trees and large branches to fall in scattered locations. The most impact was on the electric grid, let to a lesser degree than further north in West Virginia. Power outages lasted a few days in some areas. The lack of electricity in the midst of the heat wave, disrupted the daily routines of those citizens for several days. Water and ice were in high demand.
Event Narrative Trees were blown down in scattered locations about the county. Around 1,300 customers lost electricity.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2012-06-30 17:05 EST-5
Begin Location 0N HURLEY
Begin Lat/Lon 37.42/-82.03
End Date 2012-06-30 17:05 EST-5
End Location 0N HURLEY
End Lat/Lon 37.42/-82.03
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A west to northwest wind flow aloft continued, as the dome of hot and more stable air resided to the west and south. An impulse in that flow aloft, along with the maximum heating and instability of late afternoon, helped trigger thunderstorms.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-01 09:12 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2012-07-01 09:12 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative South of a nearly stationary front in the Ohio Valley, predawn showers and thunderstorms weakened as they headed toward northeastern Kentucky. An outflow boundary from that convection helped trigger a new cluster of showers and thunderstorms in southeast Kentucky during the morning. These moved southeast into Virginia.
The same pattern produced another round of showers and thunderstorms later that evening.
Event Narrative Trees were blown down onto power lines.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-05 13:20 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2012-07-05 13:20 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms over eastern Ohio and western Pennsylvania weakened during the morning hours of the 5th. However, a strong outflow boundary from this convection pushed south. By late morning, the heating of the unstable air combined with the outflow boundary to trigger additional storms that pushed south across West Virginia, reaching Virginia by mid afternoon.
Event Narrative Trees were knocked down onto power lines, causing electric outages.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-05 13:25 EST-5
Begin Location 0N OAKWOOD
Begin Lat/Lon 37.22/-82
End Date 2012-07-05 13:25 EST-5
End Location 0N OAKWOOD
End Lat/Lon 37.22/-82
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 4.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms over eastern Ohio and western Pennsylvania weakened during the morning hours of the 5th. However, a strong outflow boundary from this convection pushed south. By late morning, the heating of the unstable air combined with the outflow boundary to trigger additional storms that pushed south across West Virginia, reaching Virginia by mid afternoon.
Event Narrative Multiple trees were blown down.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-05 13:35 EST-5
Begin Location 0N DAVENPORT
Begin Lat/Lon 37.1/-82.13
End Date 2012-07-05 13:35 EST-5
End Location 0N DAVENPORT
End Lat/Lon 37.1/-82.13
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms over eastern Ohio and western Pennsylvania weakened during the morning hours of the 5th. However, a strong outflow boundary from this convection pushed south. By late morning, the heating of the unstable air combined with the outflow boundary to trigger additional storms that pushed south across West Virginia, reaching Virginia by mid afternoon.
Event Narrative Multiple trees were blown down onto power lines.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-25 00:18 EST-5
Begin Location 2NNE BIG ROCK
End Date 2012-07-25 02:00 EST-5
End Location 0S GRUNDY
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A boundary was leftover from convection during the afternoon of the 24th near the southern border of West Virginia with Kentucky and Virginia. A narrow band of showers and thunderstorms redeveloped overnight along that boundary. The flow was parallel to the convective band, resulting in repetitive heavy rain over a portion of Buchanan County. Rain amounts of 1.5 to 2.1 inches were measured in less than an hour, with totals near 3 inches in less than 3 hours. Flash flooding occurred on small streams mainly north through east of Grundy. Grundy measured 2.1 inches for their 24

hour rain total.
Event Narrative Creeks and their feeder runs overflowed. Some of the basins included along Home Creek, Slate Creek, and Dismal Creek. This caused minor flash flooding along vulnerable roads.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-31 17:00 EST-5
Begin Location 0N PAW PAW
End Date 2012-07-31 19:00 EST-5
End Location 1SSW HURLEY
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 100.00K
Crop Damage 0.00K
Episode Narrative A disturbance in the winds aloft tracked into the mountainous counties by late afternoon. This feature, along with outflow boundaries from earlier afternoon convection, helped to focus thunderstorms. Local downpours occurred around Hurley of Buchanan County and Haysi of Dickenson County.
Event Narrative Rain estimates of 2 to 4 inches in less than 3 hours caused flash flooding on small streams and runs. The Knox Creek basin flooded including its Guess Fork and Cedar Branch. Roads and private bridges were flooded and damaged. No dwelling damage was reported to county emergency services.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-10-29 11:00 EST-5
End Date 2012-10-31 02:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 250.00K
Crop Damage 0.00K
Episode Narrative A rare consolidation of a strong mid and upper level trough in the polar jet with a tropical hurricane named Sandy resulted in a historical snow storm for the month of October.
Periods of rain fell from late on the 27th into the 28th, as a cold front moved east. In response to the colder air associated with the polar jet and the strengthening mid

level trough, light rain changed to the first snowflakes around 0000E to 0200E on Monday the 29th. This was only across the high terrain of southwest Virginia northward into the mountainous counties of central West Virginia. For example, the ground was white by dawn on the mountaintops near Nora. However, little accumulations were seen through the morning hours of the 29th.
The main event began around midday on the 29th, with the brunt of the storm occurring overnight Monday night through the day on Tuesday the 30th. The snow decreased in intensity Tuesday evening, but some lighter snow mixed with drizzle and freezing drizzle lingered into the early morning hours on Wednesday the 31st.
Snow accumulations were highly dependent on elevation. Snow accumulations were mostly 2 to 12 inches. For example, the cooperative observer near Nora measured 10 inches. Near blizzard conditions were seen over the exposed high terrain, but not throughout a majority of Buchanan and Dickenson Counties.
The weight of the snow caused trees and branches to snap or bend onto power lines and blocked roads. Over 5,500 customers lost electricity, mostly in Dickenson County.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2013-01-17 11:30 EST-5
End Date 2013-01-17 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative The last of 3 distinct waves, along a stalled front to the east and south, passed during the day on the 17th. The precipitation started as rain during the morning. It changed over to sleet and wet snow by midday. A quick shot of heavy wet snow fell during the afternoon hours. Four to 13 inches of snow fell in 6 hours across Dickenson and Buchanan Counties. The upper limit was over the high terrain in the eastern portion of both counties. For example, the cooperative observer in the high terrain near Nora measured 11 inches. An unofficial report of around 13 inches was received around West Dante. Amounts of 4 to 6 inches were more common in the river valley communities.
Event Narrative

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2013-01-30 18:30 EST-5
Begin Location 0N ROWE
Begin Lat/Lon 37.15/-82.03
End Date 2013-01-30 20:30 EST-5
End Location 2WSW ROWE
End Lat/Lon 37.139/-82.0541
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative Ahead of a squall line, temperatures were in the 60s. Dew points were in the low and mid 50s. The convective squall line moved east at about 35 to 40 mph, passing during the mid and late morning hours on the 30th. This caused brief wind gusts of 40 to 50 mph.
With strong dynamics aloft, widespread rain fell behind the squall line until the cold front passed early on the 31st. Rainfall amounts in 12 to 18 hours were mostly 1.75 to around 2 inches. Toward the end of the rain event, small streams were swollen.
Event Narrative Small streams and runs between Deskins and Rowe flooded roads. Route 620 was affected.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2013-03-25 06:00 EST-5
End Date 2013-03-26 10:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Rain fell on the 24th. However, colder air swept into Buchanan and Dickenson Counties before dawn on the 25th. Lingering moisture deposited 1 to 3 inches of snow accumulation into the morning of the 26th.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN

WFO RLX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2013-05-20 10:00 EST-5
Begin Location 2NNE BREAKS
End Date 2013-05-20 12:30 EST-5
End Location 1WNW BUCHANAN CO ARPT
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 200.00K
Crop Damage 0.00K
Episode Narrative A weak mid level flow existed over a moist lower atmosphere. Slow moving showers, with embedded thunderstorms, developed near dawn over Buchanan County. These showers moved along their northwest to southeast axis, causing repetitive showers over the small streams during the morning.
Rain amounts of 2 to 2.5 inches of rain were measured around Grundy in 3 to 4 hours. Radar estimated rain amounts upwards of 3 inches. A few small streams in the mountainous terrain flooded the narrow hollows between the Kentucky border and the Grundy vicinity. The steep terrain also caused some saturated mountainsides to slide into homes.
Event Narrative Small streams, such as Lynn Camp Creek, Old Home Creek, Jacks Creek, and Stiltner Creek flooded. Water was 1 to 2 feet deep in spots on adjacent roads. The water damaged the roads and the private bridges to residences.
Seven homes were damaged. Most of the damage was from water in the basements. One double wide manufactured home was knocked off its foundation from a land slide. Another slide knocked a tree into a carport, damaged the car and the back of the home.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2013-07-17 18:35 EST-5
Begin Location 1N JANEY
Begin Lat/Lon 37.2351/-82.048
End Date 2013-07-17 18:35 EST-5
End Location 1N JANEY
End Lat/Lon 37.2351/-82.048
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative Instability, moisture, and

afternoon heat developed clusters of showers and thunderstorms along the West Virginia and Virginia border between Bluefield and Lewisburg on the 17th. This convection moved southwest during the early evening, reaching into Buchanan County.
Event Narrative Trees were blown down along Route 460.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2013-09-02 18:30 EST-5
Begin Location 1S VANSANT
End Date 2013-09-02 19:45 EST-5
End Location 1SW BUCHANAN CO ARPT
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative Well south of the prefrontal convection, a small cluster of showers and thunderstorms became anchored over the mountains of southern Buchanan County during the early evening on Labor Day.
Event Narrative Rain estimates of 1.5 to 2 inches in an hour and a storm total of 2 to 2.5 inches in 3 hours fell mainly southwest of Vansant toward Leemaster and Prater.
Small streams, such as Trace Fork Branch and War Fork, flooded and damaged roads. Water was around a mobile home along Route 83.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-06 16:00 EST-5
End Date 2014-01-07 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 50.00K
Crop Damage 0.00K
Episode Narrative An arctic cold front sweep through far western Virginia between 0200E and 0400E on Monday the 6th. Rain showers and temperatures in the 40s and 50s quickly became snow showers with temperatures falling through the 20s by dawn. Snow

accumulations were less than 2 inches. Temperatures continued to fall during the day on the 6th, with blustery winds. Readings reached down into the single digits by sunset.
Temperatures at dawn on the 7th were mostly 5 below zero to 10 below zero. The coldest temperatures came from the highest elevations.
Wind chill readings bottomed out in the minus 20 to minus 30 degree range overnight and into the morning hours for most counties.
Despite sunshine, temperatures were slow to recover during the day on the 7th. However, the wind did subside during the afternoon.
A scattering of frozen pipes, power outages, home furnace difficulties, and vehicular engine problems occurred. Repair companies were kept busy. County public school systems were closed.
Event Narrative

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-25 09:00 EST-5
End Date 2014-01-25 21:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong warm air advection in the Ohio Valley helped develop snow after dawn on the 25th. Lulls in the snowfall developed during the midday. A strong cold front and its associated mid level disturbance helped trigger more showery snow during the early evening. Snow totals of 2 to 4 inches were common.

Event Cold/Wind Chill
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-28 19:00 EST-5
End Date 2014-01-30 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative Colder air started to filter in on Monday the 27th. Yet, a storm across the southeastern states brushed the area with an inch or less of snow

during the late day and evening on the 28th.
In its wake, drier and colder air moved south for dawn on Wednesday the 29th. Yet, the main force of this cold wave remained further north, including Ohio and West Virginia. Temperatures were slightly below zero for most communities. Clintwood had a minimum temperature of 6 below zero for one of the colder readings.
A second cold night was felt with dawn temperatures on the 30th with very similar temperatures, mostly in the zero to 5 below zero range. However, Clintwood again observed 6 below zero.
The environment began to moderate on Thursday afternoon the 30th.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source County Official
NCEI Data Source CSV
Begin Date 2014-02-12 15:00 EST-5
End Date 2014-02-13 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Snow spread north during the afternoon of the 12th, reaching into Dickenson and Buchanan Counties around 1500E. Temperatures were mostly in the mid and upper 20s at the onset of the snow. The snow was associated with a developing coastal storm that was still located over northern Florida. Meanwhile, high pressure ridged down the eastern seaboard and kept plenty of cold air in the lower atmosphere.
Heavy snow fell during the evening hours, with some decrease during the late night hours. The coastal storm was centered along the Virginia and North Carolina coast line by dawn on the 13th. The wrap around snow on the western side of the mid and upper level feature caused the snow to continue to fall during the daylight hours on the 13th, finally ending in the afternoon.
Total storm snow accumulations of 10 to 15 inches were common. For example, the cooperative observer near Clintwood measured 12 inches, while Grundy had a 10 inch accumulation, and John Flannagan Lake observed 8 inches.
Unofficial reports included 14 inches at Haysi, 11 inches at Hurley and 12 inches over Compton Mountain.

Event Winter Storm
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-03-03 01:00 EST-5
End Date 2014-03-03 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong north to south temperature gradient existed in the Ohio Valley as a cold front gradually sank south. The front sank south, reaching Buchanan and Dickenson late on the 2nd. Strong dynamics associated with a strengthening wind speed maximum in the flow well above the ground, lead to waves along the front. Each wave enhanced the precipitation and helped push the surface front further south.
After 1 to 1.5 inches of rain, the transition from freezing rain to sleet and finally snow began after 0100E on the 3rd. The duration of the freezing rain was mostly 1 to 3 hours before sleet and snow became the dominate precipitation type. Ice accretion amounts were mainly under a quarter of an inch. However, a quarter to a half inch of ice did accumulate in the Haysi vicinity. Most locations were observing all snow by dawn on the 3rd. The last and main wave along the frontal zone enhanced the snow for the morning hours on the 3rd.
The end result was snow accumulations of 3 to 4 inches in less than 12 hours.
The quick drop in temperature after the initial rain and freezing rain, made it difficult to remove the accumulating snow from roadways. Readings dropped from the 30s into the teens during this storm.

Event Strong Wind
Magnitude 40 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-03-12 13:00 EST-5
End Date 2014-03-12 17:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 25.00K
Crop Damage 0.00K
Episode Narrative A strengthening low pressure system crossed through Ohio into southern Pennsylvania

during the daylight hours of the 12th. Temperatures were in the 50s and 60s ahead of its associated cold front. The cold front swept through far western Virginia during the afternoon hours. In the wake of the front, falling temperatures and strong pressure rises resulted in widespread wind gusts around 45 mph. A fallen tree damaged a house in Oakwood. In the same area, a tree fell onto a truck.
In the colder air overnight into the 13th, banded snow showers fell. A few enhanced streaks had accumulations of 2 to 3 inches of snow. For example, the cooperative observer measured 3 inches. The county schools were closed in Dickenson County, while Buchanan County had a 2 hour delay.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-03-12 19:00 EST-5
End Date 2014-03-13 07:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strengthening low pressure system crossed through Ohio into southern Pennsylvania during the daylight hours of the 12th. Temperatures were in the 50s and 60s ahead of its associated cold front. The cold front swept through far western Virginia during the afternoon hours. In the wake of the front, falling temperatures and strong pressure rises resulted in widespread wind gusts around 45 mph. A fallen tree damaged a house in Oakwood. In the same area, a tree fell onto a truck.
In the colder air overnight into the 13th, banded snow showers fell. A few enhanced streaks had accumulations of 2 to 3 inches of snow. For example, the cooperative observer measured 3 inches. The county schools were closed in Dickenson County, while Buchanan County had a 2 hour delay.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2014-04-28 15:43 EST-5
Begin Location 0N ROWE
Begin Lat/Lon 37.15/-82.03

End Date 2014-04-28 15:43 EST-5
End Location 0N ROWE
End Lat/Lon 37.15/-82.03
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative As nearly stationary front was located near the southern West Virginia border with Virginia during the afternoon of the 28th. More unstable air was located to the southwest. Thunderstorms moved southeast Kentucky, then northeast into Virginia.
Event Narrative A home weather station reported a gust to 63 mph. However, the only visible effects was a loose piece of corrugated metal got blown into a tree.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2014-06-05 02:00 EST-5
Begin Location 1N HURLEY
End Date 2014-06-05 03:30 EST-5
End Location 3NE HURLEY
Deaths Direct/Indirect 0/0
Injuries Direct/Indirect 0/0
Property Damage 200.00K
Crop Damage 0.00K
Episode Narrative A cold front sagged south into southern West Virginia by dawn on the 4th. A strong low pressure for early June moved east through the Midwest, along the frontal boundary, during the day on the 4th. Dew points were in the upper 60s and lower 70s near and south of the front. The disturbance passed to the east by early on the 5th.
Several rounds of showers and thunderstorms passed through eastern Kentucky and West Virginia during the afternoon and evening hours on the 4th. The last round of the showers and thunderstorms sank down into northern Buchanan County after 0000E on the 5th. These lingering bands of showers and storms became oriented northwest to southeast along their movement.
Event Narrative An estimated 2 to 3.5 inches of rain fell in less than 3 hours. The hardest hit basins in this steep mountain terrain were along Upper Elk Creek and Guesses Fork. Small private bridges to homes were washed out. Roads were damaged. A few homes had minor basement flooding.
The axis of this small heavy rain area crossed the state border. Flash flooding also occurred in a small section of McDowell County, West Virginia.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-06-11 23:30 EST-5
Begin Location 0N HURLEY
End Date 2014-06-12 01:15 EST-5
End Location 2E HURLEY
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative Clusters of showers and thunderstorms moved north during the overnight hours of the 11th into the 12th. Rains estimated at 1.5 to 2 inches of fell in a few hours over wet terrain. Minor flash flooding occurred.
Event Narrative Feeder streams into Knox Creek, including Laurel Fork, flooded and closed roads. No structures were flooded. Mud and debris slides also occurred in this steep terrain.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-11-01 00:01 EST-5
End Date 2014-11-01 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong mid level disturbance, and its associated cold pocket aloft, brought the first snow of the season as the month began. An elevation dependent accumulation of 1 to 4 inches occurred. The cooperative observer near Nora, elevation around 2700 feet, measured a 4 inch accumulation.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2015-02-14 14:00 EST-5
End Date 2015-02-14 23:00 EST-5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Another arctic front swept through during the late afternoon of the 14th. Temperatures dropped from the 30s into the teens in a few hours. In the wake of the front, wind gusts of 35 to 45 mph were common well through the night. Snow showers formed ahead of the front, with a heavier burst of snow along the front. Accumulations of 2 to 4 inches were common.
Temperatures dropped into the single digits by dawn on the 15th.
Early on the 15th, wind chill readings of minus 10 to minus 15 were common.

Event Cold/Wind Chill
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-14 23:00 EST-5
End Date 2015-02-15 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Another arctic front swept through during the late afternoon of the 14th. Temperatures dropped from the 30s into the teens in a few hours. In the wake of the front, wind gusts of 35 to 45 mph were common well through the night. Snow showers formed ahead of the front, with a heavier burst of snow along the front. Accumulations of 2 to 4 inches were common.
Temperatures dropped into the single digits by dawn on the 15th.
Early on the 15th, wind chill readings of minus 10 to minus 15 were common.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-02-16 07:30 EST-5
End Date 2015-02-17 02:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0

Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A unique snow storm hit on the holiday for Washington's Birthday.
Light snow began falling around dawn on the 16th when the temperature was hovering in the 10 to 15 degree range. The snow increased during the morning, then decreased that evening. The snow ended early on the 17th. The temperature only crept up into the upper teens and lower 20s during the later part of the storm. Snow accumulations of 10 to 12 inches were common. For example, Grundy and Clintwood both measured around 11 inches.
It was the first significant snow storm of the 2014-2015 winter for this section of Virginia.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-18 22:00 EST-5
End Date 2015-02-20 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative In less than a week, a second arctic front swept through far western Virginia during the afternoon hours of the 18th. Snow showers formed ahead of the front, with a few bands lingering into the evening hours. Snow accumulations were mostly 1 to 2 inches. Temperatures dropped to either side of zero by dawn on the 19th based on elevation. Despite sunshine through icy low clouds, daytime readings only recovered into the 5 to 10 degree range. Wind chill readings of minus 10 to minus 20 were felt during the daylight hours.
With an existing snow pack, diminishing winds, and a clear sky, temperatures dropped into the 15 to 20 below zero range for most communities by dawn on the 20th. Near Clintwood, the cooperative observer measured 23 below zero for the coldest. This equaled the coldest temperature in Clintwood during the cold wave in February of 1996. At Grundy, the minimum temperature reached 17 below zero. This was colder than the minus 12 felt back in February 1996 and January 1994.

Event Winter Storm
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Trained Spotter
NCEI Data Source CSV

Begin Date 2015-02-21 03:00 EST-5
End Date 2015-02-21 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative After the arctic deep freeze at dawn on the 20th, snow, sleet, and freezing rain overspread far western Virginia around 0300E on the 21st. After 1 to 2 inches of wet snow in the river valleys, the snow changed to freezing rain for 3 to 4 hours during the morning. The cold ground temperatures allowed freezing rain to continue even with air temperatures of 33 and 34 degrees. Ice accumulations reached a maximum of a quarter of an inch. The freezing rain became mostly rain by midday for these low elevations. However, in the higher terrain of eastern Buchanan and eastern Dickenson Counties, wet snow continued into the afternoon before ending as drizzle that evening. Clintwood observed 4 to 5 inches of snow. One spotter from the Sandy Ridge area, near the Wise County border, reported 18 inches of snow.
Total melted precipitation totals were over 1.5 inches. Melting slush and snow piles from plowing and shoveling prevented the normal drainage of water. Water pooled on many roads. Ice filled streams were swollen, but no major flooding occurred. Ice dams in residential gutters and downspouts allowed runoff to seep into homes.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-25 22:00 EST-5
End Date 2015-02-26 07:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Buchanan and Dickenson Counties were on the northwestern edge of a large winter storm that moved through the southeastern states. Snow accumulations of 2 to 4 inches were common. For example, the cooperative observers at Grundy, Clintwood, and Nora all measured 3 inches. With the cold February, the total snow pack remained around 10 to 18 inches.

County/Area BUCHANAN
WFO RLX
Report Source Emergency Manager

NCEI Data Source CSV
Begin Date 2015-03-04 17:00 EST-5
Begin Location 1S DAVENPORT
Begin Lat/Lon 37.0855/-82.13
End Date 2015-03-05 17:00 EST-5
End Location 2WNW PAYNESVILLE
End Lat/Lon 37.3442/-81.9384
Deaths Direct/Indirect 1/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 50.00K
Crop Damage 0.00K
Episode Narrative A warm front lifted north through the area on the 3rd. Rain amounts were mostly around 2 to 4 tenths of an inch. Late afternoon and evening temperatures rose into the 40s and 50s. Winds and dew points also increased. This combination helped accelerate the melting of any leftover snow cover.
Rains increased again during the afternoon of the 4th. A steady rain continued into the night. Rain rates were mostly 1 to 2 tenths of an inch per hour. This initiated small stream and head water river flooding during the night.
Around 2245E on the 4th, a flood fatality occurred in Buchanan County when a man drove into high water.
Rainfall totals reached 1.75 to 2 inches as the rain was finally transitioning to wet snow before dawn on the 5th. As minor small stream flooding continued, the snow accumulated 4 to 5 inches. The snow diminished toward evening on the 5th.
Event Narrative Small streams started to flood by evening on the 4th. Guess Fork flooded roads around Hurley.
Around 2245E on the 4th, a 61 year old man drove his car into flood waters near the mouth of Hurricane Creek with the Russell Fork. This was along Route 80. His car was washed into the water. His body was recovered the next day. A female occupant of the car was able to escape.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-03-05 04:30 EST-5
End Date 2015-03-05 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A warm front lifted north through the area on the 3rd. Rain amounts were mostly around 2 to 4 tenths of an inch. Late afternoon and evening

temperatures rose into the 40s and 50s. Winds and dew points also increased. This combination helped accelerate the melting of any leftover snow cover.
Rains increased again during the afternoon of the 4th. A steady rain continued into the night. Rain rates were mostly 1 to 2 tenths of an inch per hour. This initiated small stream and head water river flooding during the night.
Around 2245E on the 4th, a flood fatality occurred in Buchanan County when a man drove into high water.
Rainfall totals reached 1.75 to 2 inches as the rain was finally transitioning to wet snow before dawn on the 5th.
As minor small stream flooding continued, the snow accumulated 4 to 5 inches. The snow diminished toward evening on the 5th.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-06-18 17:40 EST-5
Begin Location 1E GRUNDY
Begin Lat/Lon 37.2805/-82.0898
End Date 2015-06-18 17:40 EST-5
End Location 1E GRUNDY
End Lat/Lon 37.2805/-82.0898
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative Multiple cellular convection formed during the early afternoon across eastern Kentucky and southern West Virginia, then moved into far western Virginia late in the afternoon. A few storms pulsed to stronger levels. Brief downpours also caused full ditch lines along roads and muddy swollen creeks. A gauge along Slate Creek measured 0.99 inches in just 15 minutes.
Event Narrative Trees were blown down along Slate Creek and Route 83.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2015-06-18 18:10 EST-5
Begin Location 1NNW DWIGHT
Begin Lat/Lon 37.2686/-81.9386

End Date 2015-06-18 18:10 EST-5
End Location 1NNW DWIGHT
End Lat/Lon 37.2686/-81.9386
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative Multiple cellular convection formed during the early afternoon across eastern Kentucky and southern West Virginia, then moved into far western Virginia late in the afternoon. A few storms pulsed to stronger levels. Brief downpours also caused full ditch lines along roads and muddy swollen creeks. A gauge along Slate Creek measured 0.99 inches in just 15 minutes.
Event Narrative Trees fell along Route 640 and Hale Creek.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-14 04:40 EST-5
Begin Location 0N JEWELL VLY
End Date 2015-07-14 07:00 EST-5
End Location 1NE KELSA
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative A mesoscale convective complex moved southeast and reached into southwest Virginia during the early evening hours on the 13th.
More thunderstorms formed during the overnight hours and moved southeast into Virginia during the predawn hours on the 14th. This caused some flash flooding near dawn.
Finally, thunderstorms formed in northern Ohio ahead of a cold front and mid level disturbance during the midday and early afternoon on the 14th. These storms formed into a squall line and moved southeast, reaching Virginia during the early evening hours of the 14th.
Event Narrative Small streams quickly rose and temporarily closed roads. Examples included Long Branch near Patterson and Dismal Creek near Whitewood.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN

WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2016-01-22 05:00 EST-5
End Date 2016-01-23 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A major storm spread snow north, reaching far western Virginia before dawn on Friday the 22nd. The initial warm air advection snow was heavy at times, but it lifted out of Buchanan and Dickenson Counties by mid morning. A mid level dry slot also worked into the area during the late morning and early afternoon, causing lulls and lighter precipitation. Sleet was mixed with the lighter snows during the afternoon on the 22nd. The snow increased again in coverage by mid afternoon.
Periods of snow fell through the night, then diminished by midday on Saturday the 23rd.
Prior to this storm, 1 to 3 inches of old snow was on the ground. Accumulations of 5 to 8 inches were common. For example, the snow depth at Clintwood went from 3 inches prior to the storm to 11 inches in its wake. Near Nora, the snow depth went from 2 inches to 10 inches as a result of the storm. In Grundy, the snow depth went from 1 inch to 6 inches.

Event Heavy Snow
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2016-02-14 16:15 EST-5
End Date 2016-02-15 04:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong warm advection, north of a warm front in Tennessee, caused snow to develop across far western Virginia during the late afternoon on the 14th.
Four to 6 inches of snow fell in less than 12 hours. For example, Clintwood had a 4 inch accumulation, while Grundy saw a 5 inch accumulation. A 6 inch accumulation fell near Nora.
The snow changed to rain by late morning on the 15th. Occasional rain fell into the early hours of the 16th before ending as some wet snow and drizzle.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2016-05-01 18:35 EST-5
Begin Location 1ESE PAW PAW
Begin Lat/Lon 37.42/-82.1
End Date 2016-05-01 18:35 EST-5
End Location 1ESE PAW PAW
End Lat/Lon 37.42/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms formed during the mid afternoon over Kentucky and southern West Virginia. New convection transitioned south and reached extreme western Virginia by evening.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-16 19:01 EST-5
Begin Location 0N GRUNDY
Begin Lat/Lon 37.28/-82.1
End Date 2016-06-16 19:01 EST-5
End Location 0N GRUNDY
End Lat/Lon 37.28/-82.1
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Low pressure was situated north of the region in the lower Great Lakes during the afternoon of June 16th. A warm front was draped from Lake Erie south and east through Maryland and the Delmarva Peninsula, with a well-developed warm sector in place to the south and west of this boundary. By the afternoon, surface temperatures had warmed into the low to mid 80s across southern Ohio and most of West Virginia. A moist and unstable air mass was in place, with surface dew points in the mid to upper 60s and nearly 3000j/kg of ML CAPE analyzed by RUC analysis. 500 mb flow was near 50 knots and a possible large-scale damaging wind event was expected. Thunderstorms developed in east-central Ohio near the I-70 corridor

after 2pm and moved south and east over the Ohio Valley and into West Virginia. Later in the evening after the main line of thunderstorms exited West Virginia to the east, a few thunderstorms at the tail end of this line produced wind damage in southwest Virginia.
Event Narrative There were a few trees down in the county including in Grundy.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-23 19:01 EST-5
Begin Location 1S HARMON
Begin Lat/Lon 37.29/-82.2
End Date 2016-06-23 19:01 EST-5
End Location 1S HARMON
End Lat/Lon 37.29/-82.2
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed during the afternoon hours of the 23rd over the Ohio Valley. These thunderstorms moved south and east through eastern Kentucky and southern West Virginia, eventually making their way into southwest VA by 7:00 p.m. Thunderstorms produced wind damage throughout Buchanan and Dickenson counties.
Event Narrative There were four trees reported down along route 609 in Harman.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2016-06-23 19:20 EST-5
Begin Location 1N MT HERON
Begin Lat/Lon 37.19/-82
End Date 2016-06-23 19:20 EST-5
End Location 1N MT HERON
End Lat/Lon 37.19/-82
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed during

the afternoon hours of the 23rd over the Ohio Valley. These thunderstorms moved south and east through eastern Kentucky and southern West Virginia, eventually making their way into southwest VA by 7:00 p.m. Thunderstorms produced wind damage throughout Buchanan and Dickenson counties.
**Event Narrative	Trees were reported down in southern Buchanan County.**

**Event	Thunderstorm Wind**
**Magnitude	50 kts.**
**State	VIRGINIA**
**County/Area	BUCHANAN**
**WFO	RLX**
**Report Source	911 Call Center**
**NCEI Data Source	CSV**
**Begin Date	2016-07-04 18:36 EST-5**
**Begin Location	2E HURLEY**
**Begin Lat/Lon	37.42/-82**
**End Date	2016-07-04 18:36 EST-5**
**End Location	2E HURLEY**
**End Lat/Lon	37.42/-82**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
**Property Damage	0.00K**
**Crop Damage	0.00K**
**Episode Narrative	A warm front lifted north from southern West Virginia and northeast Kentucky during the morning hours, into central Ohio and northern West Virginia by early afternoon. By evening, the warm front was in eastern Ohio and western Pennsylvania.**
A round of showers from the predawn hours into the mid morning was associated with that warm front.
More convection followed during the evening hours, eventually moving into far western Virginia. Local downpours were common.
**Event Narrative	Numerous trees were blown down, causing blocked roads in the Hurley area.**

**Event	Thunderstorm Wind**
**Magnitude	50 kts.**
**State	VIRGINIA**
**County/Area	BUCHANAN**
**WFO	RLX**
**Report Source	911 Call Center**
**NCEI Data Source	CSV**
**Begin Date	2016-07-04 18:40 EST-5**
**Begin Location	1N PRATER**
**Begin Lat/Lon	37.24/-82.2**
**End Date	2016-07-04 18:40 EST-5**
**End Location	1N PRATER**
**End Lat/Lon	37.24/-82.2**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**

Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A warm front lifted north from southern West Virginia and northeast Kentucky during the morning hours, into central Ohio and northern West Virginia by early afternoon. By evening, the warm front was in eastern Ohio and western Pennsylvania.
A round of showers from the predawn hours into the mid morning was associated with that warm front.
More convection followed during the evening hours, eventually moving into far western Virginia. Local downpours were common.
Event Narrative Trees fell down along Knob Hill Road.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-07-06 19:00 EST-5
Begin Location 1ESE DESKINS
Begin Lat/Lon 37.1953/-82.0873
End Date 2016-07-06 19:00 EST-5
End Location 1ESE DESKINS
End Lat/Lon 37.1953/-82.0873
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative Instability driven thunderstorms formed during the early evening. A few storms pulsed to stronger levels, causing local wind damage. Brief downpours and considerable lightning were more common.
Event Narrative Large branches were blown down along Route 620 near Licklog Branch.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-04-23 14:00 EST-5
Begin Location 2ENE BREAKS
Begin Lat/Lon 37.3107/-82.2436
End Date 2017-04-24 07:00 EST-5
End Location 2E KELSA
End Lat/Lon 37.4531/-82.0301

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Multiple waves of low pressure brought a prolonged period of rainy weather from the 20th through the 22nd. Generally one to three inches of rain fell during this time. This caused a slow rise on creeks and streams across Southwestern Virginia. On the 23rd, two to three inches of rain fell, pushing some creeks and streams out of their banks. Periods of rainfall continued overnight before drier weather arrived and flooding subsided around daybreak on the 24th. In addition to the flooding, the soggy soil resulted in numerous mudslides.
The cooperative observer at Nora measured 5.43 inches of rainfall from the 21st through the morning of the 24th. The cooperative observer at Grundy measured 3 inches over the same time period.
The Cranes Nest River near Clintwood experienced minor flooding, cresting at 13.9 feet, or about a foot above bankfull of 13 feet.
Event Narrative Numerous roads were closed across Buchanan County due to flooding and mudslides. Examples included Route 460 near Big Rock and Garden Creek Road near Grundy.

Event Strong Wind
Magnitude 35 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-11-18 11:00 EST-5
End Date 2017-11-18 23:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A strong cold front moved through the Central Appalachians late on the 18th. Ahead of the front, in unseasonably warm air, a strong low level jet resulted in gusty winds during the late morning and afternoon. Additional strong wind gusts occurred in showers along and just ahead of the cold front. A wind gust of 40 miles per hour was reported by a CWOP station near Clintwood during the afternoon.
Many trees were blown down, resulting in localized power outages. Some in Dickenson County didn't have power restored until the 20th.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2018-01-29 19:00 EST-5
End Date 2018-01-30 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A deep upper trough crossed the central Appalachians on the 29th and 30th, with a period of light snowfall. Generally, 2 to 3 inches of snow fell from the afternoon of the 29th into the morning of the 30th. The cooperative observer in Clintwood measured 3.1 inches of snow, while the observer in Grundy received 2 inches.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2018-02-01 20:00 EST-5
End Date 2018-02-02 10:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong Arctic cold front moved across the region on the 1st. Temperatures were warm ahead of the front, and a lot of the precipitation fell as rain. However, cold air rushed in during the evening, changing the rain to snow. Around 3 inches of snow fell from late on the 1st into the morning of the 2nd. For example, the cooperative observer at Nora in Dickenson County, measured 3.8 inches, while reports on social media indicated only 2-3 inches in lower elevation parts of the county.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2018-02-10 17:00 EST-5
Begin Location 1NE BREAKS
Begin Lat/Lon 37.314/-82.2604

End Date 2018-02-11 12:00 EST-5
End Location 4ENE KELSA
End Lat/Lon 37.4794/-82.0141
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A frontal system was draped across the central Appalachians on the 10th and 11th. As waves moved along the front, periods of heavy rainfall moved across Southwestern Virginia. Rainfall started during the morning of the 10th, with the heaviest rain from late afternoon overnight into the 11th. Three to four inches of rain fell over the 24 hour period, which lead to widespread flooding from the afternoon of the 10th, into the 11th. The cooperative observer at Nora in Dickenson County measured 4.04 inches of rainfall from the storm and a trained spotter in Clintwood measured 3.25 inches. In Buchanan County, the cooperative observer at Grundy measured 3.52 inches of rain and a mesonet gauge on Keen Mountain measured 3.04 inches. Dickenson County was placed under a state of emergency, and voluntary evacuation were started for the most flood prone spots in the county. A state of emergency was also declared by Buchanan County officials.
As the water drained through creeks and streams and into the rivers, river flooding occurred on the Russell Fork River and Cranes Nest River. John W. Flannagan Lake jumped 20 feet in just 24 hours, as the US Army Corps of Engineers shut down the dam's outflow to lessen river flooding in the region.
Event Narrative Multiple creeks and streams across the county flooded, including War Fork near Prater which closed State Route 83. Lesters Fork near Hurley also flooded, closing Route 650. the flood gates were closed in Grundy to keep water from the Levisa Fork from entering the city. Low lying areas around Davenport were flooded by high water on Hurricane Creek and Russell Fork. The Russell Fork also caused flooding of low lying areas in the community of Council.

Event Winter Weather
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source Social Media
NCEI Data Source CSV
Begin Date 2018-03-24 05:00 EST-5
End Date 2018-03-24 22:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K

Episode Narrative	On the northern side of a low pressure system, a narrow band of strong forcing developed and dropped a significant area of snow across portions of southwestern Virginia on the 24th. Across the higher elevations on the eastern side of Buchanan and Dickenson Counties 4 to 5 inches fell. The cooperative observer near Nora measured 4.8 inches, while 4 inches fell near Rowe. Farther west, generally 2 to 3 inches of snow accumulated, such as 3 inches in Clintwood and Haysi, and 2 inches in Grundy. There were several vehicle accidents across Dickenson County due to the snow covered roads.

Event	Winter Weather
State	VIRGINIA
County/Area	BUCHANAN
WFO	RLX
Report Source	COOP Observer
NCEI Data Source	CSV
Begin Date	2018-03-24 05:00 EST-5
End Date	2018-03-24 22:30 EST-5
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	30.00K
Crop Damage	0.00K
Episode Narrative	On the northern side of a low pressure system, a narrow band of strong forcing developed and dropped a significant area of snow across portions of southwestern Virginia on the 24th. Across the higher elevations on the eastern side of Buchanan and Dickenson Counties 4 to 5 inches fell. The cooperative observer near Nora measured 4.8 inches, while 4 inches fell near Rowe. Farther west, generally 2 to 3 inches of snow accumulated, such as 3 inches in Clintwood and Haysi, and 2 inches in Grundy. There were several vehicle accidents across Dickenson County due to the snow covered roads.

Event	Thunderstorm Wind
Magnitude	50 kts.
State	VIRGINIA
County/Area	BUCHANAN
WFO	RLX
Report Source	911 Call Center
NCEI Data Source	CSV
Begin Date	2018-04-04 01:10 EST-5
Begin Location	0N GRUNDY
Begin Lat/Lon	37.28/-82.1
End Date	2018-04-04 01:10 EST-5
End Location	0N GRUNDY
End Lat/Lon	37.28/-82.1
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0

Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative A strong cold front pushed through shortly after midnight on the 4th, driving a line of strong to severe thunderstorms through southwestern Virginia.
Event Narrative A tree was blown down by thunderstorm winds in Grundy.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area BUCHANAN
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2018-04-04 01:24 EST-5
Begin Location 1NE WHITEWOOD
Begin Lat/Lon 37.24/-81.86
End Date 2018-04-04 01:24 EST-5
End Location 1NE WHITEWOOD
End Lat/Lon 37.24/-81.86
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative A strong cold front pushed through shortly after midnight on the 4th, driving a line of strong to severe thunderstorms through southwestern Virginia.
Event Narrative Several trees were downed by thunderstorm winds.
---

54 events were reported in **Dickenson County, Virginia** between **05/01/2011 and 04/30/2018 (High wind limited to speed greater than 0 knots)**.

Location		Date	Time		Type	Mag	Dth	Inj	PrD	CrD
Totals:							0	0	1.626M	0.00K
CLINTWOOD		05/10/2011	20:31		Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
BARTLICK		05/24/2011	08:35		Hail	0.88 in.	0	0	0.00K	0.00K
DARWIN		07/25/2011	11:00		Flash Flood		0	0	2.00K	0.00K
DICKENSON (ZONE)		01/02/2012	16:00		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		01/14/2012	18:00		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/19/2012	10:00		Heavy Snow		0	0	100.00K	0.00K
GEORGES FORK		04/03/2012	13:20		Hail	0.88 in.	0	0	0.00K	0.00K
STRATTON		04/03/2012	13:25		Hail	1.75 in.	0	0	0.00K	0.00K
HAYSI		06/29/2012	19:35		Thunderstorm Wind	50 kts. EG	0	0	200.00K	0.00K
GEORGES FORK		07/01/2012	21:45		Hail	1.25 in.	0	0	0.00K	0.00K
CLINTWOOD		07/05/2012	13:45		Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
NORA		07/05/2012	13:50		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
HAYSI		07/31/2012	18:30		Flash Flood		0	0	85.00K	0.00K
DICKENSON (ZONE)		10/29/2012	11:00		Heavy Snow		0	0	750.00K	0.00K
DICKENSON (ZONE)		01/17/2013	11:30		Heavy Snow		0	0	0.00K	0.00K
DICKENSON (ZONE)		03/25/2013	06:00		Winter Weather		0	0	0.00K	0.00K
HAYSI		06/13/2013	12:30		Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
VIERS		08/12/2013	17:05		Flash Flood		0	0	5.00K	0.00K
DICKENSON (ZONE)		01/06/2014	16:00		Extreme Cold/wind Chill		0	0	50.00K	0.00K
DICKENSON (ZONE)		01/25/2014	09:00		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		01/28/2014	19:00		Cold/wind Chill		0	0	15.00K	0.00K
DICKENSON (ZONE)		02/12/2014	15:00		Heavy Snow		0	0	0.00K	0.00K
DICKENSON (ZONE)		03/03/2014	01:00		Winter Storm		0	0	0.00K	0.00K
DICKENSON (ZONE)		03/12/2014	19:00		Winter Weather		0	0	0.00K	0.00K
SKEETROCK		04/28/2014	14:50		Hail	2.25 in.	0	0	5.00K	0.00K
DICKENSON (ZONE)		11/01/2014	00:01		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/14/2015	14:00		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/14/2015	23:00		Cold/wind Chill		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/16/2015	07:30		Heavy Snow		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/18/2015	22:00		Extreme Cold/wind Chill		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/21/2015	03:00		Winter Storm		0	0	25.00K	0.00K
DICKENSON (ZONE)		02/25/2015	22:00		Winter Weather		0	0	0.00K	0.00K
GEORGES FORK		03/04/2015	15:30		Flood		0	0	25.00K	0.00K
DICKENSON (ZONE)		03/05/2015	04:30		Heavy Snow		0	0	0.00K	0.00K
HONEYCAMP		04/25/2015	19:30		Hail	1.00 in.	0	0	0.00K	0.00K
TRAMMEL		04/25/2015	20:00		Hail	0.88 in.	0	0	0.00K	0.00K
HONEYCAMP		06/01/2015	11:45		Thunderstorm Wind	40 kts. EG	0	0	5.00K	0.00K

CLINTWOOD		07/13/2015	16:36		Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
HAYSI		07/13/2015	16:40		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
DICKENSON (ZONE)		01/22/2016	04:00		Heavy Snow		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/14/2016	16:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL MART		06/16/2016	19:43		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL MART		06/23/2016	19:00		Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
STRATTON		06/23/2016	19:17		Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
IBEX		07/04/2016	18:40		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
OSBORNS GAP		04/23/2017	14:00		Flood		0	0	50.00K	0.00K
TANDY		05/24/2017	12:40		Hail	2.00 in.	0	0	0.00K	0.00K
CLINTWOOD		05/24/2017	13:23		Flash Flood		0	0	3.00K	0.00K
DICKENSON (ZONE)		11/18/2017	11:00		Strong Wind	35 kts. EG	0	0	20.00K	0.00K
DICKENSON (ZONE)		01/29/2018	19:00		Winter Weather		0	0	0.00K	0.00K
DICKENSON (ZONE)		02/01/2018	20:00		Winter Weather		0	0	0.00K	0.00K
OSBORNS GAP		02/10/2018	17:00		Flood		0	0	200.00K	0.00K
VICEY		02/17/2018	17:00		Flood		0	0	1.00K	0.00K
CLINTWOOD		04/04/2018	00:54		Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
Totals:							0	0	1.626M	0.00K

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-05-10 20:31 EST-5
Begin Location 0N CLINTWOOD
Begin Lat/Lon 37.15/-82.47
End Date 2011-05-10 20:31 EST-5
End Location 0N CLINTWOOD
End Lat/Lon 37.15/-82.47
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Repetitive showers and thunderstorms dropped southeast from southern Ohio, eastern Kentucky and western West Virginia into Virginia. The convection was along a warm frontal boundary.
Event Narrative Trees fell onto power lines. Electrical outages occurred.

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX

Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2011-05-24 08:35 EST-5
Begin Location 1SW BARTLICK
Begin Lat/Lon 37.2337/-82.3478
End Date 2011-05-24 08:35 EST-5
End Location 1SW BARTLICK
End Lat/Lon 37.2337/-82.3478
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A disturbance in the winds aloft helped trigger a round of morning convection. The storms moved into Virginia from eastern Kentucky.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2011-07-25 11:00 EST-5
Begin Location 1SSE DARWIN
End Date 2011-07-25 13:00 EST-5
End Location 1SSE DARWIN
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative A cluster of late morning showers and thunderstorms caused local rain amounts around 3 inches in a few hours across portions of Dickenson County. The usual ponding of water and overflowing ditch lines occurred in various locations throughout the county. However, near the Wise County border, the headwaters of the Cranes Nest River quickly flooded and closed portions of Route 72 south of Darwin. The nearby feeder streams and runs also overflowed. However, no structures were affected. Later that day, and further down the river, a river gauge rose nearly 10 feet and crested at 12.9 feet. This was just below the 13 foot bank full level.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-01-02 16:00 EST-5
End Date 2012-01-03 08:00 EST-5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Much colder air arrived on the 2nd. Snow showers were common from late afternoon through the overnight hours. Snow accumulations of 2 to 4 inches were common by dawn on the 3rd.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-01-14 18:00 EST-5
End Date 2012-01-15 04:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A clipper system deposited 2 to 3 inches of snow during the overnight period.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-02-19 10:00 EST-5
End Date 2012-02-19 22:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 100.00K
Crop Damage 0.00K
Episode Narrative As a surface low pressure system was moving east, off the southeast coast of the United States, its mid and upper level system was lifting out of the Tennessee Valley on Sunday, the 19th. Intermittent light rain and snow began after dawn. The cooling aloft and the deeper moisture associated with the comma head signature on satellite imagery moved through during the afternoon. As a result, wet snow became steady after 1200E. The snow fell at a rate of around an inch per hour during much of the afternoon. With the warm ground, and air temperatures at or slightly above freezing in the valleys, a highly elevation dependent accumulation was seen. Snow accumulations of 3 to 8 inches were common. The snow ended during the evening.
Trees or tree branches came down on overhead wires. Other wires sagged due to the weight of the snow.

Roughly 4000 customers were without electricity in the 2 counties.

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-04-03 13:20 EST-5
Begin Location 1SE GEORGES FORK
Begin Lat/Lon 37.144/-82.4911
End Date 2012-04-03 13:20 EST-5
End Location 1SE GEORGES FORK
End Lat/Lon 37.144/-82.4911
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong gradient in moisture and surface dew point existed along a nearly stationary front across southeastern Kentucky and the Virginia border with Tennessee. Afternoon convection formed just north of that boundary. One storm pulsed briefly stronger. Large hail was observed.

Event Hail
Magnitude 1.75 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2012-04-03 13:25 EST-5
Begin Location 1ENE STRATTON
Begin Lat/Lon 37.0829/-82.36
End Date 2012-04-03 13:25 EST-5
End Location 1ENE STRATTON
End Lat/Lon 37.0829/-82.36
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong gradient in moisture and surface dew point existed along a nearly stationary front across southeastern Kentucky and the Virginia border with Tennessee. Afternoon convection formed just north of that boundary. One storm pulsed briefly stronger. Large hail was observed.

Event Thunderstorm Wind
Magnitude 50 kts.

State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-06-29 19:35 EST-5
Begin Location 0N HAYSI
Begin Lat/Lon 37.22/-82.32
End Date 2012-06-29 19:55 EST-5
End Location 0N CLINTWOOD
End Lat/Lon 37.15/-82.47
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 200.00K
Crop Damage 0.00K
Episode Narrative On the second day of a developing heat wave, under a sunny sky, afternoon temperatures reached well into the 90s. Both Clintwood and Nora had 97 degrees. The 97 degrees at Clintwood was the hottest temperature on record there.
Meanwhile, an area of multi-cellular convection had moved out of northern Illinois that morning. It continued to organize and strengthen, as it propagated east and southeast across northern Indiana into western Ohio during the afternoon. As it moved through Ohio, it had already formed into a large arch of storms, or bow, with a developing cool pool in its wake. The temperature contrast between the air ahead of the developing derecho, compared to that in its wake was reaching 30 to 35 degrees. The resultant wind shift in the cool pool resulted in strong moisture convergence on the leading edge of the complex. This in turn, helped drive the storms further southeast, away from the mid and upper level wind support. However, the complex was diving right into that hot air that had obtained large convective available potential energy, on the order of 4000 to 5000 j/kg.
The weakening complex reaching into Buchanan County around 1900E. The outflow, or gust front, had outraced the rain.
Wind gusts of 55 to 65 mph were likely with the leading gust front. In the wake of these stronger winds gust, many areas did not even receive any rain. Grundy reported a meager 0.03 inches. Clintwood and Nora had no rain.
The wind caused trees and large branches to fall in scattered locations. The most impact was on the electric grid, let to a lesser degree than further north in West Virginia. Power outages lasted a few days in some areas. The lack of electricity in the midst of the heat wave, disrupted the daily routines of those citizens for several days. Water and ice were in high demand.
Event Narrative Trees and large branches were blown down in scattered locations about the county. Electricity was lost to around 800 customers.

Event Hail
Magnitude 1.25 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-07-01 21:45 EST-5
Begin Location 1SE GEORGES FORK
Begin Lat/Lon 37.14/-82.49
End Date 2012-07-01 21:45 EST-5
End Location 1SE GEORGES FORK
End Lat/Lon 37.14/-82.49
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative South of a nearly stationary front in the Ohio Valley, predawn showers and thunderstorms weakened as they headed toward northeastern Kentucky. An outflow boundary from that convection helped trigger a new cluster of showers and thunderstorms in southeast Kentucky during the morning. These moved southeast into Virginia.
The same pattern produced another round of showers and thunderstorms later that evening.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-05 13:45 EST-5
Begin Location 0N CLINTWOOD
Begin Lat/Lon 37.15/-82.47
End Date 2012-07-05 13:45 EST-5
End Location 0N CLINTWOOD
End Lat/Lon 37.15/-82.47
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms over eastern Ohio and western Pennsylvania weakened during the morning hours of the 5th. However, a strong outflow boundary from this convection pushed south. By late morning, the heating of the unstable air combined with the outflow boundary to trigger additional storms that pushed south across West Virginia, reaching Virginia by mid afternoon.
Event Narrative Trees were blown down causing power outages. Over 400 customers lost electricity.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-05 13:50 EST-5
Begin Location 0N NORA
Begin Lat/Lon 37.07/-82.35
End Date 2012-07-05 13:50 EST-5
End Location 0N NORA
End Lat/Lon 37.07/-82.35
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms over eastern Ohio and western Pennsylvania weakened during the morning hours of the 5th. However, a strong outflow boundary from this convection pushed south. By late morning, the heating of the unstable air combined with the outflow boundary to trigger additional storms that pushed south across West Virginia, reaching Virginia by mid afternoon.
Event Narrative Trees were blown down causing power outages.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-31 18:30 EST-5
Begin Location 0N HAYSI
End Date 2012-07-31 20:30 EST-5
End Location 1SE RUSSELL MART
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 85.00K
Crop Damage 0.00K
Episode Narrative A disturbance in the winds aloft tracked into the mountainous counties by late afternoon. This feature, along with outflow boundaries from earlier afternoon convection, helped to focus thunderstorms. Local downpours occurred around Hurley of Buchanan County and Haysi of Dickenson County.
Event Narrative Rain estimates of 1.5 to 3 inches fell in less than 3 hours. This included Lick Creek and Turkey Branch. Four roads were closed with 2 roads sustaining damage. Driveways were washed out with

damage to their drain pipes.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-10-29 11:00 EST-5
End Date 2012-10-31 02:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 750.00K
Crop Damage 0.00K
Episode Narrative A rare consolidation of a strong mid and upper level trough in the polar jet with a tropical hurricane named Sandy resulted in a historical snow storm for the month of October.
Periods of rain fell from late on the 27th into the 28th, as a cold front moved east. In response to the colder air associated with the polar jet and the strengthening mid level trough, light rain changed to the first snowflakes around 0000E to 0200E on Monday the 29th. This was only across the high terrain of southwest Virginia northward into the mountainous counties of central West Virginia. For example, the ground was white by dawn on the mountaintops near Nora. However, little accumulations were seen through the morning hours of the 29th.
The main event began around midday on the 29th, with the brunt of the storm occurring overnight Monday night through the day on Tuesday the 30th. The snow decreased in intensity Tuesday evening, but some lighter snow mixed with drizzle and freezing drizzle lingered into the early morning hours on Wednesday the 31st.
Snow accumulations were highly dependent on elevation. Snow accumulations were mostly 2 to 12 inches. For example, the cooperative observer near Nora measured 10 inches. Near blizzard conditions were seen over the exposed high terrain, but not throughout a majority of Buchanan and Dickenson Counties.
The weight of the snow caused trees and branches to snap or bend onto power lines and blocked roads. Over 5,500 customers lost electricity, mostly in Dickenson County.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2013-01-17 11:30 EST-5
End Date 2013-01-17 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below,

when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative The last of 3 distinct waves, along a stalled front to the east and south, passed during the day on the 17th. The precipitation started as rain during the morning. It changed over to sleet and wet snow by midday. A quick shot of heavy wet snow fell during the afternoon hours. Four to 13 inches of snow fell in 6 hours across Dickenson and Buchanan Counties. The upper limit was over the high terrain in the eastern portion of both counties. For example, the cooperative observer in the high terrain near Nora measured 11 inches. An unofficial report of around 13 inches was received around West Dante. Amounts of 4 to 6 inches were more common in the river valley communities.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2013-03-25 06:00 EST-5
End Date 2013-03-26 10:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Rain fell on the 24th. However, colder air swept into Buchanan and Dickenson Counties before dawn on the 25th. Lingering moisture deposited 1 to 3 inches of snow accumulation into the morning of the 26th.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2013-06-13 12:30 EST-5
Begin Location 0N HAYSI
Begin Lat/Lon 37.22/-82.32
End Date 2013-06-13 12:30 EST-5
End Location 0N HAYSI
End Lat/Lon 37.22/-82.32
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K

Episode Narrative A large cluster of showers and thunderstorms raced east and southeast at around 50 mph, reaching far western Virginia during the early afternoon. Wind gusts of 40 to 45 mph were common. At least 1 location likely had a stronger gust. Brief downpours, minor street flooding, and ponding of water also occurred.
Event Narrative Trees were blown down.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2013-08-12 17:05 EST-5
Begin Location 1S VIERS
End Date 2013-08-12 18:45 EST-5
End Location 1SSW TENSO
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A cluster of showers and thunderstorms developed across Kentucky during the early afternoon of the 12th. This convection moved and developed east, into southwest Virginia after 1500E.
Event Narrative Rains of 1.5 to 2 inches fell in less than 2 hours.
Lick Creek flooded roads near Nancy. Flyingpan Creek had high water along Route 80. No dwellings were flooded.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-06 16:00 EST-5
End Date 2014-01-07 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 50.00K
Crop Damage 0.00K
Episode Narrative An arctic cold front sweep through far western Virginia between 0200E and 0400E on Monday the 6th. Rain showers and temperatures in the 40s and 50s quickly became snow showers with temperatures falling through the 20s by dawn. Snow accumulations were less than 2 inches. Temperatures continued to fall during the day on the 6th, with blustery

winds. Readings reached down into the single digits by sunset.
Temperatures at dawn on the 7th were mostly 5 below zero to 10 below zero. The coldest temperatures came from the highest elevations.
Wind chill readings bottomed out in the minus 20 to minus 30 degree range overnight and into the morning hours for most counties.
Despite sunshine, temperatures were slow to recover during the day on the 7th. However, the wind did subside during the afternoon.
A scattering of frozen pipes, power outages, home furnace difficulties, and vehicular engine problems occurred. Repair companies were kept busy. County public school systems were closed.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-25 09:00 EST-5
End Date 2014-01-25 21:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong warm air advection in the Ohio Valley helped develop snow after dawn on the 25th. Lulls in the snowfall developed during the midday. A strong cold front and its associated mid level disturbance helped trigger more showery snow during the early evening. Snow totals of 2 to 4 inches were common.

Event Cold/Wind Chill
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-01-28 19:00 EST-5
End Date 2014-01-30 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Colder air started to filter in on Monday the 27th. Yet, a storm across the southeastern states brushed the area with an inch or less of snow during the late day and evening on the 28th.
In its wake, drier and colder air moved south for dawn on Wednesday the 29th. Yet, the main force of this cold wave

remained further north, including Ohio and West Virginia. Temperatures were slightly below zero for most communities. Clintwood had a minimum temperature of 6 below zero for one of the colder readings.
A second cold night was felt with dawn temperatures on the 30th with very similar temperatures, mostly in the zero to 5 below zero range. However, Clintwood again observed 6 below zero.
The environment began to moderate on Thursday afternoon the 30th.

**Event	Heavy Snow**
**State	VIRGINIA**
**County/Area	DICKENSON**
**WFO	RLX**
**Report Source	COOP Observer**
**NCEI Data Source	CSV**
**Begin Date	2014-02-12 15:00 EST-5**
**End Date	2014-02-13 15:00 EST-5**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
**Property Damage	0.00K**
**Crop Damage	0.00K**
**Episode Narrative	Snow spread north during the afternoon of the 12th, reaching into Dickenson and Buchanan Counties around 1500E. Temperatures were mostly in the mid and upper 20s at the onset of the snow. The snow was associated with a developing coastal storm that was still located over northern Florida. Meanwhile, high pressure ridged down the eastern seaboard and kept plenty of cold air in the lower atmosphere.**
Heavy snow fell during the evening hours, with some decrease during the late night hours. The coastal storm was centered along the Virginia and North Carolina coast line by dawn on the 13th. The wrap around snow on the western side of the mid and upper level feature caused the snow to continue to fall during the daylight hours on the 13th, finally ending in the afternoon.
Total storm snow accumulations of 10 to 15 inches were common. For example, the cooperative observer near Clintwood measured 12 inches, while Grundy had a 10 inch accumulation, and John Flannagan Lake observed 8 inches.
Unofficial reports included 14 inches at Haysi, 11 inches at Hurley and 12 inches over Compton Mountain.

**Event	Winter Storm**
**State	VIRGINIA**
**County/Area	DICKENSON**
**WFO	RLX**
**Report Source	Trained Spotter**
**NCEI Data Source	CSV**
**Begin Date	2014-03-03 01:00 EST-5**
**End Date	2014-03-03 15:00 EST-5**

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong north to south temperature gradient existed in the Ohio Valley as a cold front gradually sank south. The front sank south, reaching Buchanan and Dickenson late on the 2nd. Strong dynamics associated with a strengthening wind speed maximum in the flow well above the ground, lead to waves along the front. Each wave enhanced the precipitation and helped push the surface front further south.
After 1 to 1.5 inches of rain, the transition from freezing rain to sleet and finally snow began after 0100E on the 3rd. The duration of the freezing rain was mostly 1 to 3 hours before sleet and snow became the dominate precipitation type. Ice accretion amounts were mainly under a quarter of an inch. However, a quarter to a half inch of ice did accumulate in the Haysi vicinity. Most locations were observing all snow by dawn on the 3rd. The last and main wave along the frontal zone enhanced the snow for the morning hours on the 3rd.
The end result was snow accumulations of 3 to 4 inches in less than 12 hours.
The quick drop in temperature after the initial rain and freezing rain, made it difficult to remove the accumulating snow from roadways. Readings dropped from the 30s into the teens during this storm.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-03-12 19:00 EST-5
End Date 2014-03-13 07:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strengthening low pressure system crossed through Ohio into southern Pennsylvania during the daylight hours of the 12th. Temperatures were in the 50s and 60s ahead of its associated cold front. The cold front swept through far western Virginia during the afternoon hours. In the wake of the front, falling temperatures and strong pressure rises resulted in widespread wind gusts around 45 mph. A fallen tree damaged a house in Oakwood. In the same area, a tree fell onto a truck.
In the colder air overnight into the 13th, banded snow

showers fell. A few enhanced streaks had accumulations of 2 to 3 inches of snow. For example, the cooperative observer measured 3 inches. The county schools were closed in Dickenson County, while Buchanan County had a 2 hour delay.

Event Hail
Magnitude 2.25 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-04-28 14:50 EST-5
Begin Location 0N SKEETROCK
Begin Lat/Lon 37.23/-82.42
End Date 2014-04-28 14:50 EST-5
End Location 0N SKEETROCK
End Lat/Lon 37.23/-82.42
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative As nearly stationary front was located near the southern West Virginia border with Virginia during the afternoon of the 28th. More unstable air was located to the southwest. Thunderstorms moved southeast Kentucky, then northeast into Virginia.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-11-01 00:01 EST-5
End Date 2014-11-01 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong mid level disturbance, and its associated cold pocket aloft, brought the first snow of the season as the month began. An elevation dependent accumulation of 1 to 4 inches occurred. The cooperative observer near Nora, elevation around 2700 feet, measured a 4 inch accumulation.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Department of Highways

NCEI Data Source CSV
Begin Date 2015-02-14 14:00 EST-5
End Date 2015-02-14 23:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Another arctic front swept through during the late afternoon of the 14th.
Temperatures dropped from the 30s into the teens in a few hours. In the wake of the front, wind gusts of 35 to 45 mph were common well through the night. Snow showers formed ahead of the front, with a heavier burst of snow along the front. Accumulations of 2 to 4 inches were common.
Temperatures dropped into the single digits by dawn on the 15th.
Early on the 15th, wind chill readings of minus 10 to minus 15 were common.

Event Cold/Wind Chill
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-14 23:00 EST-5
End Date 2015-02-15 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Another arctic front swept through during the late afternoon of the 14th.
Temperatures dropped from the 30s into the teens in a few hours. In the wake of the front, wind gusts of 35 to 45 mph were common well through the night. Snow showers formed ahead of the front, with a heavier burst of snow along the front. Accumulations of 2 to 4 inches were common.
Temperatures dropped into the single digits by dawn on the 15th.
Early on the 15th, wind chill readings of minus 10 to minus 15 were common.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-02-16 07:30 EST-5
End Date 2015-02-17 02:00 EST-5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A unique snow storm hit on the holiday for Washington's Birthday.
Light snow began falling around dawn on the 16th when the temperature was hovering in the 10 to 15 degree range. The snow increased during the morning, then decreased that evening. The snow ended early on the 17th. The temperature only crept up into the upper teens and lower 20s during the later part of the storm. Snow accumulations of 10 to 12 inches were common. For example, Grundy and Clintwood both measured around 11 inches.
It was the first significant snow storm of the 2014-2015 winter for this section of Virginia.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-18 22:00 EST-5
End Date 2015-02-20 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative In less than a week, a second arctic front swept through far western Virginia during the afternoon hours of the 18th. Snow showers formed ahead of the front, with a few bands lingering into the evening hours. Snow accumulations were mostly 1 to 2 inches. Temperatures dropped to either side of zero by dawn on the 19th based on elevation. Despite sunshine through icy low clouds, daytime readings only recovered into the 5 to 10 degree range. Wind chill readings of minus 10 to minus 20 were felt during the daylight hours.
With an existing snow pack, diminishing winds, and a clear sky, temperatures dropped into the 15 to 20 below zero range for most communities by dawn on the 20th. Near Clintwood, the cooperative observer measured 23 below zero for the coldest. This equaled the coldest temperature in Clintwood during the cold wave in February of 1996. At Grundy, the minimum temperature reached 17 below zero. This was colder than the minus 12 felt back in February 1996 and January 1994.

Event Winter Storm
State VIRGINIA
County/Area DICKENSON

WFO RLX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2015-02-21 03:00 EST-5
End Date 2015-02-21 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 25.00K
Crop Damage 0.00K
Episode Narrative After the arctic deep freeze at dawn on the 20th, snow, sleet, and freezing rain overspread far western Virginia around 0300E on the 21st. After 1 to 2 inches of wet snow in the river valleys, the snow changed to freezing rain for 3 to 4 hours during the morning. The cold ground temperatures allowed freezing rain to continue even with air temperatures of 33 and 34 degrees. Ice accumulations reached a maximum of a quarter of an inch. The freezing rain became mostly rain by midday for these low elevations. However, in the higher terrain of eastern Buchanan and eastern Dickenson Counties, wet snow continued into the afternoon before ending as drizzle that evening. Clintwood observed 4 to 5 inches of snow. One spotter from the Sandy Ridge area, near the Wise County border, reported 18 inches of snow.
Total melted precipitation totals were over 1.5 inches. Melting slush and snow piles from plowing and shoveling prevented the normal drainage of water. Water pooled on many roads. Ice filled streams were swollen, but no major flooding occurred. Ice dams in residential gutters and downspouts allowed runoff to seep into homes.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-25 22:00 EST-5
End Date 2015-02-26 07:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Buchanan and Dickenson Counties were on the northwestern edge of a large winter storm that moved through the southeastern states. Snow accumulations of 2 to 4 inches were common. For example, the cooperative observers at Grundy, Clintwood, and Nora all measured 3 inches. With the cold February, the total snow pack remained around 10 to 18 inches.

Event Flood
-- Flood Cause Heavy Rain / Snow Melt
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-03-04 15:30 EST-5
Begin Location 0NNE GEORGES FORK
Begin Lat/Lon 37.1556/-82.4967
End Date 2015-03-05 16:30 EST-5
End Location 1S OPEN FORK
End Lat/Lon 37.0296/-82.3655
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 25.00K
Crop Damage 0.00K
Episode Narrative A warm front lifted north through the area on the 3rd. Rain amounts were mostly around 2 to 4 tenths of an inch. Late afternoon and evening temperatures rose into the 40s and 50s. Winds and dew points also increased. This combination helped accelerate the melting of any leftover snow cover.
Rains increased again during the afternoon of the 4th. A steady rain continued into the night. Rain rates were mostly 1 to 2 tenths of an inch per hour. This initiated small stream and head water river flooding during the night.
Around 2245E on the 4th, a flood fatality occurred in Buchanan County when a man drove into high water.
Rainfall totals reached 1.75 to 2 inches as the rain was finally transitioning to wet snow before dawn on the 5th. As minor small stream flooding continued, the snow accumulated 4 to 5 inches. The snow diminished toward evening on the 5th.
Event Narrative Small stream flooding began during the afternoon on the 4th. Browning Hollow, near Clintwood, had water over the road. The Cranes Nest River near Clintwood crested a few feet over bank full, the highest level in 10 years. The water receded in the county toward the end of the snow storm on the 5th.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-03-05 04:30 EST-5
End Date 2015-03-05 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K

Crop Damage 0.00K
Episode Narrative A warm front lifted north through the area on the 3rd. Rain amounts were mostly around 2 to 4 tenths of an inch. Late afternoon and evening temperatures rose into the 40s and 50s. Winds and dew points also increased. This combination helped accelerate the melting of any leftover snow cover.
Rains increased again during the afternoon of the 4th. A steady rain continued into the night. Rain rates were mostly 1 to 2 tenths of an inch per hour. This initiated small stream and head water river flooding during the night.
Around 2245E on the 4th, a flood fatality occurred in Buchanan County when a man drove into high water.
Rainfall totals reached 1.75 to 2 inches as the rain was finally transitioning to wet snow before dawn on the 5th.
As minor small stream flooding continued, the snow accumulated 4 to 5 inches. The snow diminished toward evening on the 5th.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2015-04-25 19:30 EST-5
Begin Location 1SE HONEYCAMP
Begin Lat/Lon 37.12/-82.47
End Date 2015-04-25 19:30 EST-5
End Location 1SE HONEYCAMP
End Lat/Lon 37.12/-82.47
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A low pressure wave rode east through Kentucky during the late afternoon and evening, along a strong east to west front. There was a 30 degree temperature contrast on either side of the front.
Just south of the surface front, a few discrete thunderstorms cells formed ahead of the main cluster of convection. These cells moved into southwest Virginia during the evening hours.

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-04-25 20:00 EST-5

Begin Location 1WSW TRAMMEL
Begin Lat/Lon 37.0157/-82.3214
End Date 2015-04-25 20:00 EST-5
End Location 1WSW TRAMMEL
End Lat/Lon 37.0157/-82.3214
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A low pressure wave rode east through Kentucky during the late afternoon and evening, along a strong east to west front. There was a 30 degree temperature contrast on either side of the front.
Just south of the surface front, a few discrete thunderstorms cells formed ahead of the main cluster of convection. These cells moved into southwest Virginia during the evening hours.

Event Thunderstorm Wind
Magnitude 40 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2015-06-01 11:45 EST-5
Begin Location 1NNW HONEYCAMP
Begin Lat/Lon 37.1385/-82.4856
End Date 2015-06-01 11:45 EST-5
End Location 1NNW HONEYCAMP
End Lat/Lon 37.1385/-82.4856
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms formed during the early afternoon along a front across the central Appalachians. A strong temperature contrast existed from south to north.
Event Narrative A tree fell on power lines along Route 72. A few hundred customers lost electricity.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-13 16:36 EST-5
Begin Location 0N CLINTWOOD
Begin Lat/Lon 37.15/-82.47
End Date 2015-07-13 16:36 EST-5

End Location 1ENE CLINTWOOD
End Lat/Lon 37.1602/-82.4492
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A mesoscale convective complex moved southeast and reached into southwest Virginia during the early evening hours on the 13th.
More thunderstorms formed during the overnight hours and moved southeast into Virginia during the predawn hours on the 14th. This caused some flash flooding near dawn.
Finally, thunderstorms formed in northern Ohio ahead of a cold front and mid level disturbance during the midday and early afternoon on the 14th. These storms formed into a squall line and moved southeast, reaching Virginia during the early evening hours of the 14th.
Event Narrative Trees were blown down around the town, including near the hospital.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-13 16:40 EST-5
Begin Location 0N HAYSI
Begin Lat/Lon 37.22/-82.32
End Date 2015-07-13 16:40 EST-5
End Location 0N HAYSI
End Lat/Lon 37.22/-82.32
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A mesoscale convective complex moved southeast and reached into southwest Virginia during the early evening hours on the 13th.
More thunderstorms formed during the overnight hours and moved southeast into Virginia during the predawn hours on the 14th. This caused some flash flooding near dawn.
Finally, thunderstorms formed in northern Ohio ahead of a cold front and mid level disturbance during the midday and early afternoon on the 14th. These storms formed into a squall line and moved southeast, reaching Virginia during the early evening hours of the 14th.
Event Narrative Trees were blown down.

Event Heavy Snow

State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2016-01-22 04:00 EST-5
End Date 2016-01-23 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A major storm spread snow north, reaching far western Virginia before dawn on Friday the 22nd. The initial warm air advection snow was heavy at times, but it lifted out of Buchanan and Dickenson Counties by mid morning. A mid level dry slot also worked into the area during the late morning and early afternoon, causing lulls and lighter precipitation. Sleet was mixed with the lighter snows during the afternoon on the 22nd. The snow increased again in coverage by mid afternoon.
Periods of snow fell through the night, then diminished by midday on Saturday the 23rd.
Prior to this storm, 1 to 3 inches of old snow was on the ground. Accumulations of 5 to 8 inches were common. For example, the snow depth at Clintwood went from 3 inches prior to the storm to 11 inches in its wake. Near Nora, the snow depth went from 2 inches to 10 inches as a result of the storm. In Grundy, the snow depth went from 1 inch to 6 inches.

Event Heavy Snow
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2016-02-14 16:00 EST-5
End Date 2016-02-15 03:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong warm advection, north of a warm front in Tennessee, caused snow to develop across far western Virginia during the late afternoon on the 14th.
Four to 6 inches of snow fell in less than 12 hours. For example, Clintwood had a 4 inch accumulation, while Grundy saw a 5 inch accumulation. A 6 inch accumulation fell near Nora.
The snow changed to rain by late morning on the 15th. Occasional rain fell into the early hours of the 16th before

ending as some wet snow and drizzle.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-16 19:43 EST-5
Begin Location 1SE RUSSELL MART
Begin Lat/Lon 37.21/-82.29
End Date 2016-06-16 19:43 EST-5
End Location 1SE RUSSELL MART
End Lat/Lon 37.21/-82.29
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Low pressure was situated north of the region in the lower Great Lakes during the afternoon of June 16th. A warm front was draped from Lake Erie south and east through Maryland and the Delmarva Peninsula, with a well-developed warm sector in place to the south and west of this boundary. By the afternoon, surface temperatures had warmed into the low to mid 80s across southern Ohio and most of West Virginia. A moist and unstable air mass was in place, with surface dew points in the mid to upper 60s and nearly 3000j/kg of ML CAPE analyzed by RUC analysis. 500 mb flow was near 50 knots and a possible large-scale damaging wind event was expected. Thunderstorms developed in east-central Ohio near the I-70 corridor after 2pm and moved south and east over the Ohio Valley and into West Virginia. Later in the evening after the main line of thunderstorms exited West Virginia to the east, a few thunderstorms at the tail end of this line produced wind damage in southwest Virginia.
Event Narrative There were numerous reports of trees and power lines down throughout Dickenson County, especially between Clincho and Haysi.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-23 19:00 EST-5
Begin Location 1SE RUSSELL MART
Begin Lat/Lon 37.21/-82.29
End Date 2016-06-23 19:00 EST-5
End Location 1SE RUSSELL MART

End Lat/Lon 37.21/-82.29
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed during the afternoon hours of the 23rd over the Ohio Valley. These thunderstorms moved south and east through eastern Kentucky and southern West Virginia, eventually making their way into southwest VA by 7:00 p.m. Thunderstorms produced wind damage throughout Buchanan and Dickenson counties.
Event Narrative There were numerous reports of downed trees in the Haysi vicinity.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-23 19:17 EST-5
Begin Location 1NE STRATTON
Begin Lat/Lon 37.09/-82.36
End Date 2016-06-23 19:17 EST-5
End Location 1NE STRATTON
End Lat/Lon 37.09/-82.36
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed during the afternoon hours of the 23rd over the Ohio Valley. These thunderstorms moved south and east through eastern Kentucky and southern West Virginia, eventually making their way into southwest VA by 7:00 p.m. Thunderstorms produced wind damage throughout Buchanan and Dickenson counties.
Event Narrative A roof was blown off the Binns-Counts community center.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-07-04 18:40 EST-5
Begin Location 1ESE IBEX
Begin Lat/Lon 37.04/-82.46
End Date 2016-07-04 18:40 EST-5

End Location 1ESE IBEX
End Lat/Lon 37.04/-82.46
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A warm front lifted north from southern West Virginia and northeast Kentucky during the morning hours, into central Ohio and northern West Virginia by early afternoon. By evening, the warm front was in eastern Ohio and western Pennsylvania.
A round of showers from the predawn hours into the mid morning was associated with that warm front.
More convection followed during the evening hours, eventually moving into far western Virginia. Local downpours were common.
Event Narrative Trees were blown down along Canay Ridge.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-04-23 14:00 EST-5
Begin Location 1SE OSBORNS GAP
Begin Lat/Lon 37.1885/-82.5336
End Date 2017-04-24 07:00 EST-5
End Location 2SW BREAKS
End Lat/Lon 37.2825/-82.2995
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 50.00K
Crop Damage 0.00K
Episode Narrative Multiple waves of low pressure brought a prolonged period of rainy weather from the 20th through the 22nd. Generally one to three inches of rain fell during this time. This caused a slow rise on creeks and streams across Southwestern Virginia. On the 23rd, two to three inches of rain fell, pushing some creeks and streams out of their banks. Periods of rainfall continued overnight before drier weather arrived and flooding subsided around daybreak on the 24th. In addition to the flooding, the soggy soil resulted in numerous mudslides.
The cooperative observer at Nora measured 5.43 inches of rainfall from the 21st through the morning of the 24th. The cooperative observer at Grundy measured 3 inches over the same time period.
The Cranes Nest River near Clintwood experienced minor flooding, cresting at 13.9 feet, or about a foot above

bankfull of 13 feet.
Event Narrative Multiple roads were closed due to flooding, with several roads partially washed out. Water entered the basements of some homes along Coeburn Road south of Clintwood.

Event Hail
Magnitude 2.00 in.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Public
NCEI Data Source CSV
Begin Date 2017-05-24 12:40 EST-5
Begin Location 1SE TANDY
Begin Lat/Lon 37.21/-82.39
End Date 2017-05-24 12:40 EST-5
End Location 1SE TANDY
End Lat/Lon 37.21/-82.39
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Showers and thunderstorms developed along a warm front on the 24th. The showers and storms produced very heavy rainfall with one to two inches of rain in a short time. This rain fell on already saturated soils resulting in flash flooding. One storm briefly pulsed up and produced hail.
Event Narrative Photo with ruler submitted via social media.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-05-24 13:23 EST-5
Begin Location 0NE CLINTWOOD
End Date 2017-05-24 14:45 EST-5
End Location 1NE CLINTWOOD
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative Showers and thunderstorms developed along a warm front on the 24th. The showers and storms produced very heavy rainfall with one to two inches of rain in a short time. This rain fell on already saturated soils resulting in flash flooding. One storm briefly pulsed up and produced hail.

Event Narrative Several roads in and around Clintwood were closed due to flooding.

Event Strong Wind
Magnitude 35 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-11-18 11:00 EST-5
End Date 2017-11-18 23:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative A strong cold front moved through the Central Appalachians late on the 18th. Ahead of the front, in unseasonably warm air, a strong low level jet resulted in gusty winds during the late morning and afternoon. Additional strong wind gusts occurred in showers along and just ahead of the cold front. A wind gust of 40 miles per hour was reported by a CWOP station near Clintwood during the afternoon.
Many trees were blown down, resulting in localized power outages. Some in Dickenson County didn't have power restored until the 20th.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2018-01-29 19:00 EST-5
End Date 2018-01-30 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A deep upper trough crossed the central Appalachians on the 29th and 30th, with a period of light snowfall. Generally, 2 to 3 inches of snow fell from the afternoon of the 29th into the morning of the 30th. The cooperative observer in Clintwood measured 3.1 inches of snow, while the observer in Grundy received 2 inches.

Event Winter Weather
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source COOP Observer

NCEI Data Source CSV
Begin Date 2018-02-01 20:00 EST-5
End Date 2018-02-02 10:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strong Arctic cold front moved across the region on the 1st. Temperatures were warm ahead of the front, and a lot of the precipitation fell as rain. However, cold air rushed in during the evening, changing the rain to snow. Around 3 inches of snow fell from late on the 1st into the morning of the 2nd. For example, the cooperative observer at Nora in Dickenson County, measured 3.8 inches, while reports on social media indicated only 2-3 inches in lower elevation parts of the county.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2018-02-10 17:00 EST-5
Begin Location 0SSE OSBORNS GAP
Begin Lat/Lon 37.1936/-82.5471
End Date 2018-02-11 11:00 EST-5
End Location 1SE IBEX
End Lat/Lon 37.0399/-82.4703
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 200.00K
Crop Damage 0.00K
Episode Narrative A frontal system was draped across the central Appalachians on the 10th and 11th. As waves moved along the front, periods of heavy rainfall moved across Southwestern Virginia. Rainfall started during the morning of the 10th, with the heaviest rain from late afternoon overnight into the 11th. Three to four inches of rain fell over the 24 hour period, which lead to widespread flooding from the afternoon of the 10th, into the 11th. The cooperative observer at Nora in Dickenson County measured 4.04 inches of rainfall from the storm and a trained spotter in Clintwood measured 3.25 inches. In Buchanan County, the cooperative observer at Grundy measured 3.52 inches of rain and a mesonet gauge on Keen Mountain measured 3.04 inches. Dickenson County was placed under a state of emergency, and voluntary evacuation were started for the most flood prone spots in the county. A state of emergency was also declared by Buchanan County officials.

As the water drained through creeks and streams and into the rivers, river flooding occurred on the Russell Fork River and Cranes Nest River. John W. Flannagan Lake jumped 20 feet in just 24 hours, as the US Army Corps of Engineers shut down the dam's outflow to lessen river flooding in the region.
Event Narrative Water from flooding along Crooked Branch got into Dyers Chapel near Clinchco, and covered some equipment at a nearby well services business. Several drivers had to be rescued after driving into high water near Haysi. At least 8 people had to be rescued throughout the night, but fortunately there were no injuries. Social media pictures showed a number of vehicles parked in private driveways were flooded.
An earthen dam failed at Camp Jacob in the far southwest corner of the county, draining the nearly 10 acre lake and causing significant damage to the camp.
Many roads were flooded across the county. This included US Route 460, due to high water along Levisa Fork and Slate Creek. County Route 611 was closed due to flooding from Barts Lick Creek, and County Route 608 due to water from Doe Branch. Route 637 was closed due to flooding along the Cranes Nest River and Lick Branch, and Route 612 was under water due to Laurel Creek and Georges Fork. Bearpen Creek also flooded near Isom. Several private roads and bridges across the county were also washed out.
The Russell Fork River at Haysi rose above its flood stage of 19 feet on the evening of the 10th. The river crested at about 20.5 feet just after midnight on the 11th, and returned to its banks by sunrise. This caused flooding along parts of Route 63 and 80/83. Minor water also effected the park and some businesses in Haysi.
The Cranes Nest River in Clintwood also surged out of its banks on the evening of the 10th. It rose to just over 14.5 feet by midnight, about a foot and a half over bankfull level, and returned to its banks during the pre-dawn hours of the 11th. This flooded a section of Route 649 as well as several camps along the river.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2018-02-17 17:00 EST-5
Begin Location 1WNW VICEY
Begin Lat/Lon 37.2307/-82.2713
End Date 2018-02-17 20:00 EST-5
End Location 2NW BEE
End Lat/Lon 37.1424/-82.2029
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative A wave of low pressure and surface front crossed from Kentucky and Tennessee into Virginia and West Virginia, producing heavy rainfall on the 16th and 17th. Generally 1 to 2 inches of rain fell, resulting in some minor creek and road flooding.
Event Narrative Several roads were closed due to high water. Coeburn Road was flooded near the Wise County Line due to high water on the Cranes Nest River. Russell Fork also flooded, causing high water along Sandlick Road near Haysi.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area DICKENSON
WFO RLX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2018-04-04 00:54 EST-5
Begin Location 1E CLINTWOOD
Begin Lat/Lon 37.15/-82.46
End Date 2018-04-04 00:54 EST-5
End Location 1E CLINTWOOD
End Lat/Lon 37.15/-82.46
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 4.00K
Crop Damage 0.00K
Episode Narrative A strong cold front pushed through shortly after midnight on the 4th, driving a line of strong to severe thunderstorms through southwestern Virginia.
Event Narrative Several trees were blown down, which also took down some power lines.
---

66 events were reported in **Russell County, Virginia** between **05/01/2011 and 04/30/2018 (High wind limited to speed greater than 0 knots)**.

Location			Date	Time		Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	120.00K	0.00K
LEBANON			05/10/2011	21:00		Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
CASTLEWOOD			05/24/2011	09:45		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HONAKER			05/24/2011	09:45		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BOLTON			05/24/2011	15:55		Tornado	EF0	0	0	30.00K	0.00K
CASTLEWOOD			06/21/2011	21:15		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HONAKER			07/22/2011	15:35		Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			02/19/2012	10:00		Heavy Snow		0	0	10.00K	0.00K
LEBANON			02/22/2012	21:00		Heavy Rain		0	0	0.00K	0.00K
LEBANON			02/29/2012	18:50		Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
LEBANON			02/29/2012	19:30		Hail	1.00 in.	0	0	0.00K	0.00K
HONAKER			07/01/2012	09:40		Hail	1.25 in.	0	0	0.00K	0.00K
HONAKER			07/01/2012	09:42		Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
DAW			07/05/2012	13:40		Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			10/28/2012	03:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			10/28/2012	03:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			10/28/2012	03:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			10/28/2012	03:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			10/28/2012	03:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			12/20/2012	12:00		High Wind	55 kts. EG	0	0	8.00K	0.00K
RUSSELL (ZONE)			12/26/2012	05:00		High Wind	52 kts. EG	0	0	5.00K	0.00K
LEBANON			01/16/2013	08:00		Flood		0	0	1.00K	0.00K
RUSSELL (ZONE)			01/17/2013	13:45		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/26/2013	11:30		High Wind	55 kts. EG	0	0	20.00K	0.00K
RUSSELL (ZONE)			03/05/2013	23:00		Heavy Snow		0	0	0.00K	0.00K
LEBANON			05/19/2013	15:58		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HONAKER			06/13/2013	12:35		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
LEBANON			06/13/2013	12:38		Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
CASTLEWOOD			07/18/2013	16:00		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			02/12/2014	21:55		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/13/2014	12:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/13/2014	12:00		Heavy Snow		0	0	0.00K	0.00K
LEBANON			02/21/2014	04:45		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			03/03/2014	04:00		Ice Storm		0	0	0.00K	0.00K
HONAKER			06/10/2014	18:30		Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
HONAKER			06/10/2014	19:00		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
CASTLEWOOD			06/11/2014	12:00		Hail	1.00 in.	0	0	0.00K	0.00K
CASTLEWOOD			06/11/2014	12:00		Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
LEBANON			06/11/2014	13:05		Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K

LEBANON			07/14/2014	16:40		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			02/16/2015	16:50		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/16/2015	17:30		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/17/2015	09:30		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/17/2015	09:30		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/17/2015	09:30		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/21/2015	07:12		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/21/2015	10:50		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/21/2015	13:45		Heavy Snow		0	0	0.00K	0.00K
LEBANON			03/04/2015	12:45		Flood		0	0	2.00K	0.00K
DANTE			03/04/2015	22:40		Flood		0	0	1.00K	0.00K
WEST RAVEN			06/08/2015	16:55		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LEBANON			07/13/2015	17:10		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			11/18/2015	16:10		High Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			11/18/2015	22:38		High Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			11/18/2015	23:49		High Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			01/22/2016	05:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/08/2016	15:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/08/2016	15:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			02/08/2016	15:00		Heavy Snow		0	0	0.00K	0.00K
CASTLEWOOD			05/12/2016	17:10		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HONAKER			05/12/2016	17:50		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HONAKER			06/16/2016	21:15		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
DYE			06/21/2016	17:35		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
PUTNAM			06/23/2016	19:30		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RUSSELL (ZONE)			01/06/2017	21:00		Heavy Snow		0	0	0.00K	0.00K
RUSSELL (ZONE)			01/06/2017	21:00		Heavy Snow		0	0	0.00K	0.00K
CASTLEWOOD			04/23/2017	10:00		Flood		0	0	0.00K	0.00K
Totals:								0	0	120.00K	0.00K

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-05-10 21:00 EST-5
Begin Location 0N LEBANON
Begin Lat/Lon 36.9/-82.08
End Date 2011-05-10 21:00 EST-5
End Location 0N LEBANON
End Lat/Lon 36.9/-82.08
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage

Crop Damage
**Episode Narrative	Repeat convection became severe along a warm front extending across Southwest Virginia and Northeast Tennessee during the late evening hours. Convection became organized along the boundary transitioning into an mesoscale convective system which moved across Southwest Virginia and Northeast Tennessee.**
**Event Narrative	Trees and power lines were reported down across the county.**

**Event	Thunderstorm Wind**
**Magnitude	50 kts.**
**State	VIRGINIA**
**County/Area	RUSSELL**
**WFO	MRX**
**Report Source	Law Enforcement**
**NCEI Data Source	CSV**
**Begin Date	2011-05-24 09:45 EST-5**
**Begin Location	1E CASTLEWOOD**
**Begin Lat/Lon	36.88/-82.29**
**End Date	2011-05-24 09:45 EST-5**
**End Location	1E CASTLEWOOD**
**End Lat/Lon	36.88/-82.29**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
Property Damage
Crop Damage
**Episode Narrative	A short wave trough moving through the Mid Mississippi and Lower Ohio Valley produced strong convection across Kentucky and Northern Middle Tennessee early in the day. The convection organized into a Mesoscale Convective System as it moved into the unstable atmosphere across Southwest Virginia and Northeast Tennessee. Severe convection continued to form well into the afternoon in the vicinity of a west through east outflow boundary in place across extreme Southwest Virginia.**
**Event Narrative	A few trees were reported down.**

**Event	Thunderstorm Wind**
**Magnitude	50 kts.**
**State	VIRGINIA**
**County/Area	RUSSELL**
**WFO	MRX**
**Report Source	Law Enforcement**
**NCEI Data Source	CSV**
**Begin Date	2011-05-24 09:45 EST-5**
**Begin Location	0N HONAKER**
**Begin Lat/Lon	37.02/-81.98**
**End Date	2011-05-24 09:45 EST-5**
**End Location	0N HONAKER**
**End Lat/Lon	37.02/-81.98**
**Deaths Direct/Indirect	0/0 (fatality details below,**

when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A short wave trough moving through the Mid Mississippi and Lower Ohio Valley produced strong convection across Kentucky and Northern Middle Tennessee early in the day. The convection organized into a Mesoscale Convective System as it moved into the unstable atmosphere across Southwest Virginia and Northeast Tennessee. Severe convection continued to form well into the afternoon in the vicinity of a west through east outflow boundary in place across extreme Southwest Virginia.
Event Narrative A few trees were reported down.

Event Tornado
-- Scale EF0
-- Length 4.24 Miles
-- Width 50 Yards
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2011-05-24 15:55 EST-5
Begin Location 0N BOLTON
Begin Lat/Lon 36.8/-82.22
End Date 2011-05-24 15:58 EST-5
End Location 0ENE HANSONVILLE
End Lat/Lon 36.8206/-82.1479
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 30.00K
Crop Damage 0.00K
Episode Narrative A short wave trough moving through the Mid Mississippi and Lower Ohio Valley produced strong convection across Kentucky and Northern Middle Tennessee early in the day. The convection organized into a Mesoscale Convective System as it moved into the unstable atmosphere across Southwest Virginia and Northeast Tennessee. Severe convection continued to form well into the afternoon in the vicinity of a west through east outflow boundary in place across extreme Southwest Virginia.
Event Narrative An EF-0 tornado touched down near the Bolton area and moved northeast to near Hansonville, Virginia, before lifting. Several trees were downed in the path of the tornado.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL

WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-06-21 21:15 EST-5
Begin Location 0E CASTLEWOOD
Begin Lat/Lon 36.88/-82.3
End Date 2011-06-21 21:25 EST-5
End Location 0E CASTLEWOOD
End Lat/Lon 36.88/-82.3
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A boundary across the area triggered thunderstorms during the evening hours. A few of the storms produced damaging thunderstorm wind.
Event Narrative Law enforcement personnel reported 1 tree and several large limbs downed by thunderstorm wind in Castlewood.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2011-07-22 15:35 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98
End Date 2011-07-22 15:35 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Very moist atmosphere with intense heating led to the development of isolated severe convection in a moderately unstable environment. The stronger convection was limited mainly to Northeast Tennessee and Southwest Virginia.
Event Narrative A few trees were reported down at Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-02-19 10:00 EST-5
End Date 2012-02-20 00:30 EST-5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A shortwave tracking through the area combined with a cold airmass to produce heavy snow over southwest Virginia. The highest snowfall totals were in the higher elevations were up to 8 inches was reported. The lower elevations received around 1 to 4 inches of snow.
Event Narrative Dispatch reported 8 inches of snow fell in Honaker. Power poles and lines downed by the snow.

Event Heavy Rain
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-02-22 21:00 EST-5
Begin Location 2SW LEBANON
Begin Lat/Lon 36.8841/-82.0998
End Date 2012-02-22 22:00 EST-5
End Location 2SSW LEBANON
End Lat/Lon 36.8766/-82.0921
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Flash flooding in southwest Virginia was produced by heavy rain falling on ground saturated by the previous days' rainfall.
Event Narrative Standing water observed on secondary roads in and around Lebanon. Six inches of water covered VA-660 just outside of the city limits.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-02-29 18:50 EST-5
Begin Location 1N LEBANON
Begin Lat/Lon 36.91/-82.08
End Date 2012-02-29 19:00 EST-5
End Location 1N LEBANON
End Lat/Lon 36.91/-82.08
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0

Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A boundary across the area triggered scattered thunderstorms during the evening hours across southwest Virginia. A few of the storms produced damaging thunderstorm wind or hail as large as a golfball.
Event Narrative Law enforcement personnel reported trees and powerlines downed by thunderstorm wind near Lebanon.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2012-02-29 19:30 EST-5
Begin Location 1N LEBANON
Begin Lat/Lon 36.91/-82.08
End Date 2012-02-29 19:32 EST-5
End Location 1N LEBANON
End Lat/Lon 36.91/-82.08
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A boundary across the area triggered scattered thunderstorms during the evening hours across southwest Virginia. A few of the storms produced damaging thunderstorm wind or hail as large as a golfball.
Event Narrative Highway department personnel reported thunderstorms produced quarter-size hail north of Lebanon.

Event Hail
Magnitude 1.25 in.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-01 09:40 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98
End Date 2012-07-01 09:40 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage

Crop Damage
Episode Narrative **Scattered severe convection developed across the region in a weak to moderately unstable environment. An outflow boundary aided by a relatively strong west to northwesterly flow produced severe thunderstorms during the morning. A second episode of severe thunderstorms occurred during the evening as a strong thunderstorm complex moved southeast out of the Ohio Valley across the Southern Appalachians. The atmosphere supported both large hail and severe wind gusts.**
Event Narrative **Half dollar sized hail was reported at Honaker.**

Event **Thunderstorm Wind**
Magnitude **55 kts.**
State **VIRGINIA**
County/Area **RUSSELL**
WFO **MRX**
Report Source **State Official**
NCEI Data Source **CSV**
Begin Date **2012-07-01 09:42 EST-5**
Begin Location **0N HONAKER**
Begin Lat/Lon **37.02/-81.98**
End Date **2012-07-01 09:42 EST-5**
End Location **0N HONAKER**
End Lat/Lon **37.02/-81.98**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **Scattered severe convection developed across the region in a weak to moderately unstable environment. An outflow boundary aided by a relatively strong west to northwesterly flow produced severe thunderstorms during the morning. A second episode of severe thunderstorms occurred during the evening as a strong thunderstorm complex moved southeast out of the Ohio Valley across the Southern Appalachians. The atmosphere supported both large hail and severe wind gusts.**
Event Narrative **Numerous trees were reported down in Honaker.**

Event **Thunderstorm Wind**
Magnitude **60 kts.**
State **VIRGINIA**
County/Area **RUSSELL**
WFO **MRX**
Report Source **State Official**
NCEI Data Source **CSV**
Begin Date **2012-07-05 13:40 EST-5**
Begin Location **1WSW DAW**
Begin Lat/Lon **37.04/-81.89**

**End Date	2012-07-05 13:40 EST-5**
**End Location	1WSW DAW**
**End Lat/Lon	37.04/-81.89**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
**Property Damage	0.00K**
**Crop Damage	0.00K**
**Episode Narrative	Organized convection developed over the Southern Appalachian region in the presence of a very moist and unstable air mass. Relatively strong winds through a deep portion of the atmosphere helped to produce an extensive outflow boundary resulting in numerous downed trees and significant structural damage to homes and businesses. The powerful thunderstorm complex resulted in four fatalities and 9 injuries.**
**Event Narrative	Several trees were reported down five miles east northeast of Honaker.**

**Event	Heavy Snow**
**State	VIRGINIA**
**County/Area	RUSSELL**
**WFO	MRX**
**Report Source	Law Enforcement**
**NCEI Data Source	CSV**
**Begin Date	2012-10-28 03:00 EST-5**
**End Date	2012-10-31 08:00 EST-5**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
**Property Damage	0.00K**
**Crop Damage	0.00K**
**Episode Narrative	With the aid of increasing moisture supplied by the remnants of Hurricane Sandy, combined with a strong upslope wind, heavy snow was reported during a 4 day period. The heaviest snow was recorded in the higher elevation where up to 30 inches was reported breaking records for total snowfall. The northern valley was blanketed with 1 to 4 inches of snow.**
**Event Narrative	Law enforcement personnel reported 4 inches of snow fell in Lebanon.**

**Event	Heavy Snow**
**State	VIRGINIA**
**County/Area	RUSSELL**
**WFO	MRX**
**Report Source	Broadcast Media**
**NCEI Data Source	CSV**
**Begin Date	2012-10-28 03:00 EST-5**
**End Date	2012-10-31 08:00 EST-5**
**Deaths Direct/Indirect	0/0 (fatality details below, when available...)**
**Injuries Direct/Indirect	0/0**
**Property Damage	0.00K**

Crop Damage 0.00K
Episode Narrative With the aid of increasing moisture supplied by the remnants of Hurricane Sandy, combined with a strong upslope wind, heavy snow was reported during a 4 day period. The heaviest snow was recorded in the higher elevation where up to 30 inches was reported breaking records for total snowfall. The northern valley was blanketed with 1 to 4 inches of snow.
Event Narrative Broadcast media personnel reported 9 inches of snow fell 3 miles northwest of Honaker at Big A Mountain.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-10-28 03:00 EST-5
End Date 2012-10-31 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative With the aid of increasing moisture supplied by the remnants of Hurricane Sandy, combined with a strong upslope wind, heavy snow was reported during a 4 day period. The heaviest snow was recorded in the higher elevation where up to 30 inches was reported breaking records for total snowfall. The northern valley was blanketed with 1 to 4 inches of snow.
Event Narrative Law enforcement personnel reported 12 inches of snow fell in Belfast 7 miles northeast of Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-10-28 03:00 EST-5
End Date 2012-10-31 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative With the aid of increasing moisture supplied by the remnants of Hurricane Sandy, combined with a strong upslope wind, heavy snow was reported during a 4 day period. The heaviest snow was recorded in the higher elevation where up to 30 inches was reported breaking records for total snowfall. The

northern valley was blanketed with 1 to 4 inches of snow.
Event Narrative Law enforcement personnel reported 8 inches of snow fell in Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-10-28 03:00 EST-5
End Date 2012-10-31 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative With the aid of increasing moisture supplied by the remnants of Hurricane Sandy, combined with a strong upslope wind, heavy snow was reported during a 4 day period. The heaviest snow was recorded in the higher elevation where up to 30 inches was reported breaking records for total snowfall. The northern valley was blanketed with 1 to 4 inches of snow.
Event Narrative The dispatch station personnel reported 6 inches of snow fell at the dispatch center in the city of Lebanon.

Event High Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-12-20 12:00 EST-5
End Date 2012-12-20 18:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 8.00K
Crop Damage 0.00K
Episode Narrative A cold front tracked across the region producing high non-thunderstorm wind across the area. The strongest wind occurred across the higher elevations where most of the wind damage was reported. Several trees were downed by the high wind.
Event Narrative Dispatch personnel reported several trees downed by high wind countywide. The Belfast and Honaker areas were hardest hit by the wind.

Event High Wind
Magnitude 52 kts.
State VIRGINIA
County/Area RUSSELL

WFO MRX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-12-26 05:00 EST-5
End Date 2012-12-26 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A deep area of low pressure produced high non-thunderstorm wind over the area on the 26th. The highest wind were across the mountains where the damaging wind were reported. Several trees were downed by the high wind.
Event Narrative Dispatch personnel reported a few trees downed by high wind in Lebanon.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2013-01-16 08:00 EST-5
Begin Location 2NW LEBANON
Begin Lat/Lon 36.9205/-82.1056
End Date 2013-01-16 12:00 EST-5
End Location 2SW LEBANON
End Lat/Lon 36.8795/-82.1056
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative Large moist synoptic event resulted in several inches of rain across the area.
Event Narrative Thirteen roads closed.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2013-01-17 13:45 EST-5
End Date 2013-01-17 17:45 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Very strong lifting of a moist air mass in the presence of an upper level low pressure

system resulted in a heavy wet snowfall event during the period from around noon est until early evening. Atmospheric dynamics were so intense at times, that lightning was generated; i.e. thundersnow. Much of the snow accumulated across the region from Central East Tennessee northeast through Southwest Virginia, generally north of Interstate 40 and east of Interstate 75. The upper level low moved east from Northern to Northeast Georgia generating 3 to 5 inches of snow across the Great Valley of Central East Tennessee northeast to the Tri-Cities area. Much greater snowfall amounts occurred across Southwest Virginia with enhancement in the higher terrain in this region as well as over the mountains of Northeast Tennessee. In these areas, snowfall amounts ranged from 6 inches to as much as a foot in the highest elevations across Southwest Virginia.
Event Narrative Ten inches of snow was reported at Lebanon.

Event High Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2013-02-26 11:30 EST-5
End Date 2013-02-26 15:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative A deep area of low pressure moved into the region increasing the pressure gradient resulting in high non-thunderstorm wind over the area. The damaging wind was primarily across the higher elevations. Several trees were downed by the wind. In addition, a tree fell on a mobile home near Swords Creek Road in Honaker.
Event Narrative Dispatch personnel reported several trees downed by high wind throughout the county. In addition, a tree fell on a mobile home near Swords Creek in Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2013-03-05 23:00 EST-5
End Date 2013-03-06 17:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **Moderate to heavy snow fell across the higher terrain in Southwest Virginia and Northeast Tennessee as well as the Smoky Mountains from Tuesday evening through Wednesday afternoon. The heavy snow event was the result of the passage of a deep upper level low pressure system. Much of these higher terrain areas picked up three to six inches of snow while the highest peaks in the Smoky Mountains recorded snow totals as high as ten to fifteen inches.**
Event Narrative **Around one inch of snow was reported in Lebanon.**

Event **Thunderstorm Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **RUSSELL**
WFO **MRX**
Report Source **State Official**
NCEI Data Source **CSV**
Begin Date **2013-05-19 15:58 EST-5**
Begin Location **0N LEBANON**
Begin Lat/Lon **36.9/-82.08**
End Date **2013-05-19 15:58 EST-5**
End Location **0N LEBANON**
End Lat/Lon **36.9/-82.08**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **Orographics and a slightly to moderately unstable atmosphere appeared to play a role in severe thunderstorms that formed across Southwest Virginia.**
Event Narrative **Several trees were reported down in Lebanon.**

Event **Thunderstorm Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **RUSSELL**
WFO **MRX**
Report Source **Law Enforcement**
NCEI Data Source **CSV**
Begin Date **2013-06-13 12:35 EST-5**
Begin Location **0N HONAKER**
Begin Lat/Lon **37.02/-81.98**
End Date **2013-06-13 12:45 EST-5**
End Location **0N HONAKER**
End Lat/Lon **37.02/-81.98**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**

Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A front tracked through southwest Virginia producing thunderstorms during the afternoon hours. Several of the storms produced a damaging thunderstorm wind downing many trees over the area. Hail as large as quarters was also reported.
Event Narrative Law enforcement personnel reported several trees downed by thunderstorm wind in Honaker.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2013-06-13 12:38 EST-5
Begin Location 2E LEBANON
Begin Lat/Lon 36.9/-82.0438
End Date 2013-06-13 12:45 EST-5
End Location 2E LEBANON
End Lat/Lon 36.9/-82.0438
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative A front tracked through southwest Virginia producing thunderstorms during the afternoon hours. Several of the storms produced a damaging thunderstorm wind downing many trees over the area. Hail as large as quarters was also reported.
Event Narrative Law enforcement personnel reported a few trees downed by thunderstorm wind 2 miles east Lebanon.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2013-07-18 16:00 EST-5
Begin Location 1E CASTLEWOOD
Begin Lat/Lon 36.88/-82.29
End Date 2013-07-18 16:00 EST-5
End Location 1E CASTLEWOOD
End Lat/Lon 36.88/-82.29
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0

Property Damage
Crop Damage
Episode Narrative Severe thunderstorms developed later in the afternoon with continuation into mid evening as the atmosphere became moderately to extremely unstable. Deep moisture was again present on the periphery of a weakening high pressure system over the Ohio Valley. The storms produced mainly straight line wind damage which in one case resulted in a fatality in Northeast Tennessee.
Event Narrative Two trees were reported down in Castlewood.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-02-12 21:55 EST-5
End Date 2014-02-13 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Heavy snow blanketed the area as strong upper level disturbance combined with deep moisture pulled from the Carolina coast for a 2-day period. The largest snowfall totals reached 11.0 inches over southwest Virginia.
Event Narrative A trained spotter reported 5 inches of snow fell in Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-02-13 12:00 EST-5
End Date 2014-02-13 20:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Heavy snow blanketed the area as strong upper level disturbance combined with deep moisture pulled from the Carolina coast for a 2-day period. The largest snowfall totals reached 11.0 inches over southwest Virginia.
Event Narrative A trained spotter reported 9 inches of snow fell in Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-02-13 12:00 EST-5
End Date 2014-02-13 20:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Heavy snow blanketed the area as strong upper level disturbance combined with deep moisture pulled from the Carolina coast for a 2-day period. The largest snowfall totals reached 11.0 inches over southwest Virginia.
Event Narrative A trained spotter reported 8 inches of snow fell in Lebanon.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2014-02-21 04:45 EST-5
Begin Location 2NE LEBANON
Begin Lat/Lon 36.9205/-82.0544
End Date 2014-02-21 05:00 EST-5
End Location 2NE LEBANON
End Lat/Lon 36.9205/-82.0544
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms tracked into southwest Virginia during the morning hours on the 21st. Numerous trees and powerlines were downed over the area.
Event Narrative Law enforcement personnel reported a few trees downed by thunderstorm wind across the eastern portions of Russel County.

Event Ice Storm
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-03-03 04:00 EST-5
End Date 2014-03-03 11:00 EST-5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative An arctic air mass slipped into the Southern Appalachian region followed by a strong upper level system that pushed east from the Lower Mississippi Valley. Sufficient moisture was available for lifting over the dense and cold surface air resulting in an ice storm that produced accretions ranging from around one tenth to as much as one half inch. The area affected extended from the Cumberland Plateau counties closer to the Kentucky border east northeast across Southwest Virginia.
Event Narrative Freezing rain accretion across Russell County ranged from one to three tenths of an inch.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2014-06-10 18:30 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98
End Date 2014-06-10 18:50 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A cold front tracked through southwest Virginia during the afternoon hours on the 10th. Many thunderstorms developed with several of storms downing trees and powerlines.
Event Narrative Law enforcement personnel reported multiple trees were downed by thunderstorm wind in the Honaker and Cleveland areas.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2014-06-10 19:00 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98

End Date 2014-06-10 19:20 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A cold front tracked through southwest Virginia during the afternoon hours on the 10th. Many thunderstorms developed with several of storms downing trees and powerlines.
Event Narrative The public reported a few trees were downed by thunderstorm wind in Honaker.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2014-06-11 12:00 EST-5
Begin Location 0E CASTLEWOOD
Begin Lat/Lon 36.88/-82.3
End Date 2014-06-11 12:10 EST-5
End Location 0E CASTLEWOOD
End Lat/Lon 36.88/-82.3
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A frontal boundary lingered across southwest Virginia on the 11th. Thunderstorms formed in the afternoon hours with few of the storms produced a damaging thunderstorm wind by downing some trees. Hail as large as a golfball was also reported.
Event Narrative The public reported thunderstorms produced quarter-size hail in Castlewood.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2014-06-11 12:00 EST-5
Begin Location 0E CASTLEWOOD
Begin Lat/Lon 36.88/-82.3
End Date 2014-06-11 12:05 EST-5
End Location 0E CASTLEWOOD
End Lat/Lon 36.88/-82.3
Deaths Direct/Indirect 0/0 (fatality details below,

when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative A frontal boundary lingered across southwest Virginia on the 11th. Thunderstorms formed in the afternoon hours with few of the storms produced a damaging thunderstorm wind by downing some trees. Hail as large as a golfball was also reported.
Event Narrative Law enforcement personnel reported 1 tree downed by thunderstorm wind in Castlewood.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2014-06-11 13:05 EST-5
Begin Location 5SW LEBANON
Begin Lat/Lon 36.8488/-82.144
End Date 2014-06-11 13:25 EST-5
End Location 5SW LEBANON
End Lat/Lon 36.8488/-82.144
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 8.00K
Crop Damage 0.00K
Episode Narrative A frontal boundary lingered across southwest Virginia on the 11th. Thunderstorms formed in the afternoon hours with few of the storms produced a damaging thunderstorm wind by downing some trees. Hail as large as a golfball was also reported.
Event Narrative Emergency management personnel reported several trees downed by thunderstorm wind 5 miles southwest of Lebanon.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2014-07-14 16:40 EST-5
Begin Location 0N LEBANON
Begin Lat/Lon 36.9/-82.08
End Date 2014-07-14 16:40 EST-5
End Location 0N LEBANON
End Lat/Lon 36.9/-82.08
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A cold front moved toward the Southern Appalachian Region late in the evening with sufficient atmospheric shear but limited buoyancy due to the late hour. Therefore, intensity of convection ahead of the front was rather weak producing an isolated event.
Event Narrative Several trees were reported down countywide.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-02-16 16:50 EST-5
End Date 2015-02-16 22:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A winter storm tracked through area on the 16-17th with the atmosphere favorable for both heavy snow and thick ice. The highest peaks had up to 17 inches of snow while ice accumulations has up to inch.
Event Narrative Dispatch personnel reported 5 inches of snow fell in Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2015-02-16 17:30 EST-5
End Date 2015-02-16 23:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A winter storm tracked through area on the 16-17th with the atmosphere favorable for both heavy snow and thick ice. The highest peaks had up to 17 inches of snow while ice accumulations has up to inch.
Event Narrative The public reported 7 inches of snow fell in Honaker.

Event Heavy Snow
State VIRGINIA

County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-02-17 09:30 EST-5
End Date 2015-02-17 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A winter storm tracked through area on the 16-17th with the atmosphere favorable for both heavy snow and thick ice. The highest peaks had up to 17 inches of snow while ice accumulations has up to inch.
Event Narrative Emergency manager personnel reported 8 inches of snow fell in Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-02-17 09:30 EST-5
End Date 2015-02-17 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A winter storm tracked through area on the 16-17th with the atmosphere favorable for both heavy snow and thick ice. The highest peaks had up to 17 inches of snow while ice accumulations has up to inch.
Event Narrative Emergency manager personnel reported 9 inches of snow fell in Castlewood.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-02-17 09:30 EST-5
End Date 2015-02-17 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A winter storm tracked through area on the 16-17th with the atmosphere favorable for

both heavy snow and thick ice. The highest peaks had up to 17 inches of snow while ice accumulations has up to inch.
Event Narrative Emergency manager personnel reported 15 inches of snow fell in 4 mile southwest of Lebanon. The higher elevations received 14 to 16 inches in the county.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-02-21 07:12 EST-5
End Date 2015-02-21 17:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative For the second time this month the atmosphere was favorable in the production heavy snow with up to 19 inches reported.
Event Narrative Dispatch personnel reported up to 4 inches of snow in Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-02-21 10:50 EST-5
End Date 2015-02-21 19:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative For the second time this month the atmosphere was favorable in the production heavy snow with up to 19 inches reported.
Event Narrative Emergency manager personnel reported 16 inches of snow fell in Lebanon.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2015-02-21 13:45 EST-5
End Date 2015-02-21 20:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below,

when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative For the second time this month the atmosphere was favorable in the production heavy snow with up to 19 inches reported.
Event Narrative The public reported 5 inches of snow fell in Honaker.

Event Flood
-- Flood Cause Heavy Rain / Snow Melt
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-03-04 12:45 EST-5
Begin Location 1S LEBANON
Begin Lat/Lon 36.8855/-82.08
End Date 2015-03-06 08:00 EST-5
End Location 2SW CASTLEWOOD
End Lat/Lon 36.8595/-82.3256
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage 0.00K
Episode Narrative An unusually deep snow pack across southwest Virginia underwent melting from warming temperatures and from liquid rain falling upon it. Flooding in low-lying areas, streams, and rivers resulted and became widespread.
Event Narrative Several roads closed across the county due to flooding.

Event Flood
-- Flood Cause Heavy Rain / Snow Melt
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2015-03-04 22:40 EST-5
Begin Location 1SE DANTE
Begin Lat/Lon 36.9598/-82.2872
End Date 2015-03-05 08:00 EST-5
End Location 2NW DANTE
End Lat/Lon 36.9905/-82.3256
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative An unusually deep snow pack

across southwest Virginia underwent melting from warming temperatures and from liquid rain falling upon it. Flooding in low-lying areas, streams, and rivers resulted and became widespread.
Event Narrative Minor flooding reported in the Dante area. Mudslide reported in the Horton Ridge area.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2015-06-08 16:55 EST-5
Begin Location 1NNW WEST RAVEN
Begin Lat/Lon 37.1/-81.89
End Date 2015-06-08 16:55 EST-5
End Location 1NNW WEST RAVEN
End Lat/Lon 37.1/-81.89
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Low level moisture increased across the region in the southerly flow ahead of a short wave trough building southeast through the Midwest states. In addition, an outflow boundary served as additional focus for convection which became severe in a moderately unstable environment.
Event Narrative Several trees were reported down in the northern end of the county. Also, a tree fell onto a home on Franks Hollow Road in the Swords Creek area.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2015-07-13 17:10 EST-5
Begin Location 0N LEBANON
Begin Lat/Lon 36.9/-82.08
End Date 2015-07-13 17:10 EST-5
End Location 0N LEBANON
End Lat/Lon 36.9/-82.08
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A bowing line of severe convection in association with an outflow boundary moved southeast

across Southwest Virginia and Northeast Tennessee during the late afternoon through early evening hours. Atmospheric shear was more than adequate along with moderate to high instability. Widespread wind damage occurred during this event.
Event Narrative Numerous trees were reported down across the county.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2015-11-18 16:10 EST-5
End Date 2015-11-18 16:10 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative The main low pressure system moved along a northeast path from the Central Plains through the Central Great Lakes with a lead frontal system moving across the Appalachians. A southeast 45 to 55 knot low level jet crossed the higher terrain generating mountain waves along the foothills.
Event Narrative Strong wind destroyed a three bay garage along route 71 in Lebanon.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2015-11-18 22:38 EST-5
End Date 2015-11-18 22:38 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative The main low pressure system moved along a northeast path from the Central Plains through the Central Great Lakes with a lead frontal system moving across the Appalachians. A southeast 45 to 55 knot low level jet crossed the higher terrain generating mountain waves along the foothills.
Event Narrative Tree damage due to strong wind gusts was reported in Belfast.

Event High Wind

Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2015-11-18 23:49 EST-5
End Date 2015-11-18 23:49 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative The main low pressure system moved along a northeast path from the Central Plains through the Central Great Lakes with a lead frontal system moving across the Appalachians. A southeast 45 to 55 knot low level jet crossed the higher terrain generating mountain waves along the foothills.
Event Narrative Power lines were reported down due to strong wind gusts on Hayters Gap Road in Rosedale.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-01-22 05:00 EST-5
End Date 2016-01-24 04:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A strengthening low pressure system moved northeast from the Lower Mississippi Valley across the Southern Appalachians with a modified Arctic air mass in place prior to the system's arrival. Temperatures were cold enough in this air mass that much of the precipitation that fell across southwest Virginia was in the form of snow. Winter storm warning criteria was easily met with around 8 to 12 inches of snow across Southwest Virginia. In some higher terrain areas, amounts topped out around 15 to 16 inches across the southwest corner of the state with about two feet in the High Knob region.
Event Narrative Snowfall totals of 6-7 inches across the lower elevations including Lebanon and Honaker. Higher elevations had close to 18 inches of snow at locations such as Hazel Mountain and Clinch Mountain.

Event Heavy Snow
State VIRGINIA

County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2016-02-08 15:00 EST-5
End Date 2016-02-09 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Sub-freezing air spilled south through the Eastern United States for a two day period of mainly orographic snowfall as several shorter wavelength systems dropped southeast out of the Northern Plains and Great Lakes. The snow accumulated to a depth of three to five inches on average however, some greater snowfall totals occurred primarily in the highest terrain across Southwest Virginia and in the Smoky Mountains.
Event Narrative A snowfall total of 5.6 inches was measured at the dispatch center.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2016-02-08 15:00 EST-5
End Date 2016-02-09 14:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Sub-freezing air spilled south through the Eastern United States for a two day period of mainly orographic snowfall as several shorter wavelength systems dropped southeast out of the Northern Plains and Great Lakes. The snow accumulated to a depth of three to five inches on average however, some greater snowfall totals occurred primarily in the highest terrain across Southwest Virginia and in the Smoky Mountains.
Event Narrative Three inches of snow was reported at Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2016-02-08 15:00 EST-5
End Date 2016-02-09 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below,

when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Sub-freezing air spilled south through the Eastern United States for a two day period of mainly orographic snowfall as several shorter wavelength systems dropped southeast out of the Northern Plains and Great Lakes. The snow accumulated to a depth of three to five inches on average however, some greater snowfall totals occurred primarily in the highest terrain across Southwest Virginia and in the Smoky Mountains.
Event Narrative Six inches of snow was measured at Lebanon.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2016-05-12 17:10 EST-5
Begin Location 1E CASTLEWOOD
Begin Lat/Lon 36.88/-82.29
End Date 2016-05-12 17:10 EST-5
End Location 1E CASTLEWOOD
End Lat/Lon 36.88/-82.29
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A few showers and thunderstorms developed in the unstable air mass ahead of a cold front during the afternoon. The convection became severe producing damaging wind across Central East Tennessee as well as a small part of Southwest Virginia.
Event Narrative Several trees were reported down in the Castlewood area.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2016-05-12 17:50 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98
End Date 2016-05-12 17:50 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below,

when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A few showers and thunderstorms developed in the unstable air mass ahead of a cold front during the afternoon. The convection became severe producing damaging wind across Central East Tennessee as well as a small part of Southwest Virginia.
Event Narrative A few trees were reported down across the eastern half of Russell county.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2016-06-16 21:15 EST-5
Begin Location 0N HONAKER
Begin Lat/Lon 37.02/-81.98
End Date 2016-06-16 21:15 EST-5
End Location 0N HONAKER
End Lat/Lon 37.02/-81.98
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A few severe thunderstorms developed in a weakly to moderately unstable environment in association with an upper level trough. The storms were aided by orographic lifting.
Event Narrative A few trees and power lines were reported down in Honaker.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Public
NCEI Data Source CSV
Begin Date 2016-06-21 17:35 EST-5
Begin Location 1SSW DYE
Begin Lat/Lon 37.05/-81.94
End Date 2016-06-21 17:35 EST-5
End Location 1SSW DYE
End Lat/Lon 37.05/-81.94
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage

Episode Narrative A few severe thunderstorms developed in a weak to moderately unstable environment in advance of an outflow boundary building southeast out of the Upper Ohio Valley. The storms were enhanced over the higher terrain on the Cumberland Plateau.
Event Narrative Several trees were reported down near the Swords Creek.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source State Official
NCEI Data Source CSV
Begin Date 2016-06-23 19:30 EST-5
Begin Location 1E PUTNAM
Begin Lat/Lon 37.02/-81.96
End Date 2016-06-23 19:30 EST-5
End Location 1E PUTNAM
End Lat/Lon 37.02/-81.96
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Severe thunderstorms formed along an outflow boundary during the early afternoon across the Ohio Valley and this boundary moved southeast across Southwest Virginia and Northeast Tennessee during the late afternoon into the evening hours. The storms moved into a weak to moderately unstable environment generating mostly wind damage.
Event Narrative One tree was reported down east of Honaker.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2017-01-06 21:00 EST-5
End Date 2017-01-07 09:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Deep and moist air was lifted over a chilly air mass in place across the Southeastern United States as a low pressure system moved northeast from the Central Gulf of Mexico through the Middle Atlantic Coast. Heavy snowfall occurred across the Southern Appalachian region northwest of the pressure system's

path.
Event Narrative A snow depth of 3.5 inches was measured fives at Castlewood.

Event Heavy Snow
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2017-01-06 21:00 EST-5
End Date 2017-01-07 09:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Deep and moist air was lifted over a chilly air mass in place across the Southeastern United States as a low pressure system moved northeast from the Central Gulf of Mexico through the Middle Atlantic Coast. Heavy snowfall occurred across the Southern Appalachian region northwest of the pressure system's path.
Event Narrative A snow depth of 3.5 inches was measured fives at Castlewood.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area RUSSELL
WFO MRX
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2017-04-23 10:00 EST-5
Begin Location 1W CASTLEWOOD
Begin Lat/Lon 36.88/-82.3181
End Date 2017-04-23 12:00 EST-5
End Location 3NNE CASTLEWOOD
End Lat/Lon 36.9201/-82.2792
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A 500 MB trough of low pressure moved into the central plains on the 20th and 21st, and was associated with a surface front moving southeastward from the Ohio Valley into eastern Kentucky and middle Tennessee. This placed the upper Tennessee Valley in a warm and humid air mass, which aided in the generation of heavy rainfall and some severe storms on those days. The 500 MB trough then deepened into a closed low, while low pressure formed along the surface front and tracked from southern Arkansas on the 22nd to northern

Georgia on the 23rd, by which time a surface trough extended from Chattanooga to southwestern Virginia. Upper level divergence on the northeast side of the closed low and these surface boundaries contributed to additional heavy rains on the 22nd and 23rd.
Event Narrative Numerous road closures in the Castlewood area.
---

130 events were reported in **Tazewell County, Virginia** between **05/01/2011 and 04/30/2018 (High wind limited to speed greater than 0 knots)**.

Location			Date	Time		Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	2	4.583M	0.00K
RICHLANDS			05/10/2011	18:10		Hail	1.00 in.	0	0	0.00K	0.00K
CEDAR BLUFF			05/10/2011	18:10		Hail	1.00 in.	0	0	0.00K	0.00K
CLAYPOOL HILL			05/10/2011	20:24		Lightning		0	0	15.00K	0.00K
FALLS MILLS			05/13/2011	17:29		Flash Flood		0	0	0.00K	0.00K
HOCKMAN			05/24/2011	08:56		Hail	0.75 in.	0	0	0.00K	0.00K
RICHLANDS			05/24/2011	09:35		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CEDAR BLUFF			05/24/2011	15:37		Hail	1.00 in.	0	0	0.00K	0.00K
BLUEFIELD			05/26/2011	19:20		Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CEDAR BLUFF			06/09/2011	16:56		Hail	1.00 in.	0	0	0.00K	0.00K
MALDEN SPGS			06/09/2011	17:00		Hail	1.25 in.	0	0	0.00K	0.00K
MALDEN SPGS			06/09/2011	17:00		Thunderstorm Wind	50 kts. EG	0	0	2.50K	0.00K
POCAHONTAS			06/28/2011	13:48		Hail	1.75 in.	0	0	0.00K	0.00K
ADRIA			06/28/2011	14:24		Thunderstorm Wind	55 kts. EG	0	0	4.50K	0.00K
CEDAR BLUFF			07/22/2011	15:30		Flash Flood		0	0	0.00K	0.00K
RICHLANDS			08/14/2011	13:43		Hail	0.75 in.	0	0	0.00K	0.00K
BUSTHEAD			08/14/2011	14:00		Hail	1.00 in.	0	0	0.00K	0.00K
BUSTHEAD			08/14/2011	14:00		Hail	1.00 in.	0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/19/2012	09:55		Winter Storm		0	0	0.00K	0.00K
BLUEFIELD			03/02/2012	11:53		Hail	0.75 in.	0	0	0.00K	0.00K
TAZEWELL (ZONE)			03/27/2012	04:00		Frost/freeze		0	0	0.00K	0.00K
RICHLANDS			04/26/2012	10:51		Flood		0	0	0.00K	0.00K
BLUEFIELD			04/26/2012	18:05		Hail	1.00 in.	0	0	0.00K	0.00K
MUD FORK			04/26/2012	18:45		Hail	1.00 in.	0	0	0.00K	0.00K
BLUEFIELD			05/22/2012	16:30		Flood		0	0	0.00K	0.00K
POCAHONTAS			06/29/2012	19:34		Thunderstorm Wind	65 kts. EG	0	0	400.00K	0.00K
BURKES GARDEN			06/30/2012	17:45		Hail	1.00 in.	0	0	0.00K	0.00K
BUSTHEAD			06/30/2012	18:04		Hail	1.25 in.	0	0	0.00K	0.00K
ADRIA			06/30/2012	18:40		Hail	2.00 in.	0	0	50.00K	0.00K
GRATTON			06/30/2012	19:07		Hail	1.75 in.	0	0	0.00K	0.00K
DORAN			07/01/2012	09:30		Hail	1.00 in.	0	0	0.00K	0.00K
DORAN			07/01/2012	09:32		Hail	1.75 in.	0	0	0.00K	0.00K

RICHLANDS			07/01/2012	09:40		Hail	1.00 in.	0	0	0.00K	0.00K
CLAYPOOL HILL			07/01/2012	09:40		Hail	1.75 in.	0	0	0.00K	0.00K
CLIFFIELD			07/01/2012	09:45		Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
PUCKETTS STORE			07/01/2012	09:45		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
RICHLANDS			07/01/2012	22:00		Thunderstorm Wind	55 kts. EG	0	0	3.00K	0.00K
TAZEWELL			07/01/2012	22:05		Thunderstorm Wind	55 kts. EG	0	0	3.00K	0.00K
BURKES GARDEN			07/01/2012	22:25		Thunderstorm Wind	55 kts. EG	0	0	8.00K	0.00K
RICHLANDS			07/05/2012	13:24		Thunderstorm Wind	55 kts. EG	0	0	1.20K	0.00K
THOMPSON VLY			07/05/2012	13:26		Thunderstorm Wind	50 kts. EG	0	0	1.20K	0.00K
SEABOARD			07/24/2012	14:00		Heavy Rain		0	0	0.00K	0.00K
MALDEN SPGS			07/25/2012	00:57		Thunderstorm Wind	50 kts. EG	0	0	0.60K	0.00K
DORAN			07/31/2012	15:08		Flash Flood		0	0	0.00K	0.00K
TAZEWELL (ZONE)			09/18/2012	03:30		Strong Wind	39 kts. EG	0	0	1.00K	0.00K
FOURWAY			10/18/2012	16:05		Hail	0.75 in.	0	0	0.00K	0.00K
TAZEWELL (ZONE)			10/28/2012	21:15		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			10/30/2012	06:00		High Wind	50 kts. EG	0	0	5.00K	0.00K
TAZEWELL (ZONE)			12/20/2012	07:30		High Wind	50 kts. EG	0	0	0.50K	0.00K
TAZEWELL (ZONE)			12/26/2012	08:45		High Wind	55 kts. EG	0	0	15.00K	0.00K
TAZEWELL (ZONE)			12/27/2012	00:16		High Wind	57 kts. MG	0	0	0.00K	0.00K
TAZEWELL (ZONE)			01/17/2013	12:35		Heavy Snow		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/26/2013	08:30		High Wind	50 kts. EG	0	0	7.00K	0.00K
RICHLANDS			05/19/2013	16:17		Flash Flood		0	0	0.00K	0.00K
PISGAH			05/22/2013	15:00		Flash Flood		0	0	0.00K	0.00K
RICHLANDS			07/12/2013	18:40		Hail	0.75 in.	0	0	0.00K	0.00K
NORTH TAZEWELL			07/18/2013	14:30		Hail	1.00 in.	0	0	0.00K	0.00K
RICHLANDS			08/12/2013	16:53		Thunderstorm Wind	52 kts. EG	0	0	15.00K	0.00K
FROG LEVEL			08/12/2013	17:56		Flash Flood		0	0	0.00K	0.00K
MOUTH OF LAUREL			08/12/2013	18:00		Flash Flood		0	0	0.00K	0.00K
RICHLANDS			08/21/2013	17:56		Thunderstorm Wind	50 kts. EG	0	0	0.20K	0.00K
TIPTOP			09/02/2013	19:52		Flash Flood		0	0	0.50K	0.00K
TAZEWELL (ZONE)			12/08/2013	10:00		Winter Weather		0	0	0.00K	0.00K
TAZEWELL (ZONE)			01/02/2014	17:00		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			01/07/2014	00:00		Cold/wind Chill		0	0	0.00K	0.00K
TAZEWELL (ZONE)			01/25/2014	19:55		High Wind	50 kts. MG	0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/12/2014	13:25		Heavy Snow		0	0	0.00K	0.00K
TAZEWELL (ZONE)			03/12/2014	13:05		High Wind	50 kts. EG	0	0	5.00K	0.00K
TAZEWELL (ZONE)			03/13/2014	00:00		Winter Weather		0	0	0.00K	0.00K
RICHLANDS			06/10/2014	18:36		Hail	0.88 in.	0	0	0.00K	0.00K
MAXWELL			06/10/2014	18:40		Thunderstorm Wind	50 kts. EG	0	0	0.20K	0.00K
CEDAR BLUFF			06/10/2014	18:40		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
TAZEWELL (ZONE)			10/14/2014	21:45		High Wind	50 kts. EG	0	0	1.00K	0.00K
TAZEWELL (ZONE)			11/01/2014	00:00		Winter Weather		0	0	0.00K	0.00K
TAZEWELL (ZONE)			11/20/2014	00:00		High Wind	50 kts. EG	0	0	30.00K	0.00K

TAZEWELL (ZONE)			11/24/2014	12:30		Strong Wind	41 kts. MG	0	0	20.00K	0.00K
TAZEWELL (ZONE)			11/26/2014	04:00		Winter Weather		0	0	0.00K	0.00K
TAZEWELL (ZONE)			01/04/2015	07:45		High Wind	50 kts. EG	0	0	2.00K	0.00K
TAZEWELL (ZONE)			02/16/2015	09:00		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/19/2015	05:00		Extreme Cold/wind Chill		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/21/2015	08:00		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/21/2015	15:00		Avalanche		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/25/2015	23:00		Winter Weather		0	0	0.00K	0.00K
RED ASH			03/04/2015	08:00		Flood		0	0	10.00K	0.00K
HORSEPEN			05/16/2015	18:30		Flash Flood		0	0	0.00K	0.00K
YARDS			05/16/2015	19:00		Flash Flood		0	0	0.00K	0.00K
BAILEY			06/08/2015	17:49		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
TIPTOP			06/21/2015	16:00		Hail	1.00 in.	0	0	0.00K	0.00K
POCAHONTAS			06/21/2015	16:10		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
TAZEWELL (ZONE)			06/26/2015	22:57		Strong Wind	40 kts. EG	0	0	0.10K	0.00K
POCAHONTAS			07/05/2015	19:00		Flash Flood		0	0	3.500M	0.00K
YARDS			07/05/2015	19:38		Flash Flood		0	0	0.00K	0.00K
WITTENS MILLS			07/05/2015	20:00		Flash Flood		0	0	0.00K	0.00K
MUD FORK			07/05/2015	20:00		Flash Flood		0	0	200.00K	0.00K
PUCKETTS STORE			07/13/2015	17:00		Thunderstorm Wind	55 kts. EG	0	0	5.00K	0.00K
HORSEPEN			07/13/2015	17:08		Thunderstorm Wind	60 kts. EG	0	0	20.00K	0.00K
CEDAR BLUFF			07/13/2015	17:17		Hail	0.88 in.	0	0	0.00K	0.00K
TAZEWELL (ZONE)			11/18/2015	04:00		High Wind	50 kts. EG	0	0	10.00K	0.00K
TAZEWELL (ZONE)			01/05/2016	06:30		Winter Weather		0	2	0.00K	0.00K
TAZEWELL (ZONE)			01/22/2016	03:00		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/08/2016	16:35		Winter Storm		0	0	0.00K	0.00K
TAZEWELL (ZONE)			02/14/2016	12:15		Winter Storm		0	0	0.00K	0.00K
GRATTON			03/14/2016	15:25		Hail	1.00 in.	0	0	0.00K	0.00K
TAZEWELL (ZONE)			04/02/2016	19:00		High Wind	50 kts. EG	0	0	10.00K	0.00K
YARDS			05/02/2016	13:52		Hail	0.75 in.	0	0	0.00K	0.00K
YARDS			05/02/2016	14:00		Hail	1.50 in.	0	0	0.00K	0.00K
RICHLANDS			06/04/2016	17:20		Thunderstorm Wind	55 kts. EG	0	0	5.00K	0.00K
RICHLANDS ARPT			06/04/2016	17:33		Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
RICHLANDS			06/04/2016	17:36		Thunderstorm Wind	50 kts. EG	0	0	150.00K	0.00K
DORAN			06/16/2016	20:15		Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
CEDAR BLUFF			06/16/2016	20:25		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
RICHLANDS ARPT			06/21/2016	17:18		Thunderstorm Wind	55 kts. EG	0	0	2.50K	0.00K
BLUEFIELD			06/23/2016	18:52		Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
BLUEFIELD			06/23/2016	19:15		Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
YARDS			07/08/2016	14:52		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
BURKES GARDEN			08/14/2016	17:46		Thunderstorm Wind	50 kts. EG	0	0	0.60K	0.00K
SAYERSVILLE			03/01/2017	11:00		Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
RAVEN			04/23/2017	16:30		Flood		0	0	5.00K	0.00K

NORTH TAZEWELL			05/24/2017	14:00		Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
THOMPSON VLY			05/27/2017	17:30		Hail	1.00 in.	0	0	0.00K	0.00K
CLAYPOOL HILL			05/27/2017	17:58		Hail	0.88 in.	0	0	0.00K	0.00K
BLUEFIELD			06/16/2017	17:50		Flood		0	0	0.00K	0.00K
TAZEWELL (ZONE)			10/09/2017	03:00		Strong Wind	40 kts. EG	0	0	1.00K	0.00K
TAZEWELL (ZONE)			01/05/2018	02:14		Extreme Cold/wind Chill		0	0	0.00K	0.00K
RICHLANDS			02/11/2018	03:00		Flood		0	0	0.00K	0.00K
TAZEWELL (ZONE)			03/01/2018	22:10		High Wind	52 kts. EG	0	0	12.50K	0.00K
TAZEWELL (ZONE)			03/24/2018	05:00		Winter Storm		0	0	0.00K	0.00K
PLEASANT HILL			04/04/2018	01:38		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
RAVEN			04/04/2018	01:45		Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
CEDAR BLUFF			04/16/2018	02:00		Flood		0	0	0.00K	0.00K
TAZEWELL (ZONE)			04/23/2018	04:35		Strong Wind	25 kts. MG	0	0	20.00K	0.00K
Totals:								0	2	4.583M	0.00K

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2011-05-10 18:10 EST-5
Begin Location 1E RICHLANDS
Begin Lat/Lon 37.1/-81.8
End Date 2011-05-10 18:10 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong to severe storms developed along a warm front that stretched from Indiana southeast into the Carolinas. An upper level disturbance helped to trigger the storms in the mid-afternoon over southwest Virginia and then developed eastward mainly across the Mountain Empire and the New River Valley. The storms also produced heavy rainfall with several stations in Montgomery County reporting over an inch of rain in a short period, including Christiansburg 1.8S CoCoRaHs 1.61���, Christiansburg 1S COOP 1.56���, Falling Branch IFLOWS 1.46��� and Brush Mtn. IFLOWS 1.26���.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-10 18:10 EST-5
Begin Location 1NE CEDAR BLUFF
Begin Lat/Lon 37.09/-81.76
End Date 2011-05-10 18:10 EST-5
End Location 1NE CEDAR BLUFF
End Lat/Lon 37.09/-81.76

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Strong to severe storms developed along a warm front that stretched from Indiana southeast into the Carolinas. An upper level disturbance helped to trigger the storms in the mid-afternoon over southwest Virginia and then developed eastward mainly across the Mountain Empire and the New River Valley. The storms also produced heavy rainfall with several stations in Montgomery County reporting over an inch of rain in a short period, including Christiansburg 1.8S CoCoRaHs 1.61���, Christiansburg 1S COOP 1.56���, Falling Branch IFLOWS 1.46��� and Brush Mtn. IFLOWS 1.26���.

Event Lightning
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source State Official
NCEI Data Source CSV
Begin Date 2011-05-10 20:24 EST-5
Begin Location 1S CLAYPOOL HILL
Begin Lat/Lon 37.05/-81.77
End Date 2011-05-10 20:24 EST-5
End Location 1S CLAYPOOL HILL
End Lat/Lon 37.05/-81.77
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative Strong to severe storms developed along a warm front that stretched from Indiana southeast into the Carolinas. An upper level disturbance helped to trigger the storms in the mid-afternoon over southwest Virginia and then developed eastward mainly across the Mountain Empire and the New River Valley. The storms also produced heavy rainfall with several stations in Montgomery County reporting over an inch of rain in a short period, including Christiansburg 1.8S CoCoRaHs 1.61���, Christiansburg 1S COOP 1.56���, Falling Branch IFLOWS 1.46��� and Brush Mtn. IFLOWS 1.26���.
Event Narrative Lightning caused a fire at a home with significant damage reported.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-13 17:29 EST-5
Begin Location 1WSW FALLS MILLS
End Date 2011-05-13 18:30 EST-5
End Location 1W FALLS MILLS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative An upper level storm system approaching from the west helped to trigger numerous showers and thunderstorms mainly over the Appalachians and Blue Ridge Mountains. The storms developed along a slow-moving frontal boundary, and with abundant moisture in place,some of the storms produced heavy rainfall with flash flooding in several counties along with hail and strong winds.
Event Narrative Rainfall of 1 to 2 inches in less than two hours caused flooding on Mud Fork Road in the northeast part of the county.

Event Hail
Magnitude 0.75 in.
State VIRGINIA
County/Area TAZEWELL

WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-24 08:56 EST-5
Begin Location 1SW HOCKMAN
Begin Lat/Lon 37.24/-81.33
End Date 2011-05-24 08:56 EST-5
End Location 1SW HOCKMAN
End Lat/Lon 37.24/-81.33
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Two distinct upper level storm systems passed through the area, one in the late morning, the second during the late afternoon and early evening. Each brought a round of active severe weather to the region. Enough time passed after the exit of the first for afternoon heating to play a factor just prior to the arrival of the second. The earlier storms were primarily hail, while the second round consisted of strong damaging winds. Precipitation was also quite heavy with radar estimated rainfall of 1 to 3 inches, although no flooding was reported.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-24 09:35 EST-5
Begin Location 1E RICHLANDS
Begin Lat/Lon 37.1/-81.8
End Date 2011-05-24 09:35 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Two distinct upper level storm systems passed through the area, one in the late morning, the second during the late afternoon and early evening. Each brought a round of active severe weather to the region. Enough time passed after the exit of the first for afternoon heating to play a factor just prior to the arrival of the second. The earlier storms were primarily hail, while the second round consisted of strong damaging winds. Precipitation was also quite heavy with radar estimated rainfall of 1 to 3 inches, although no flooding was reported.
Event Narrative Trees were reported down in Richlands.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-05-24 15:37 EST-5
Begin Location 1NW CEDAR BLUFF
Begin Lat/Lon 37.0923/-81.7836
End Date 2011-05-24 15:37 EST-5
End Location 1NW CEDAR BLUFF
End Lat/Lon 37.0923/-81.7836
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Two distinct upper level storm systems passed through the area, one in the late morning, the

second during the late afternoon and early evening. Each brought a round of active severe weather to the region. Enough time passed after the exit of the first for afternoon heating to play a factor just prior to the arrival of the second. The earlier storms were primarily hail, while the second round consisted of strong damaging winds. Precipitation was also quite heavy with radar estimated rainfall of 1 to 3 inches, although no flooding was reported.
Event Narrative Hail reported at Pizza Hut on Front Street in Richlands.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2011-05-26 19:20 EST-5
Begin Location 1S BLUEFIELD
Begin Lat/Lon 37.24/-81.28
End Date 2011-05-26 19:20 EST-5
End Location 1S BLUEFIELD
End Lat/Lon 37.24/-81.28
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative The atmosphere quickly became very unstable on the afternoon of May 26th, which resulted in the development of severe thunderstorms, mainly in the mountains and foothills. These storms were primarily large hail producers. Also, A derecho-like feature crossed Franklin and Henry counties causing some significant damage. In addition, rainfall of 1 to 3 inches fell in a swath from Grayson County northeast all the way to Alleghany County causing isolated flash flooding.
Event Narrative A tree was blow down near Hillcrest Lane.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2011-06-09 16:56 EST-5
Begin Location 1NE CEDAR BLUFF
Begin Lat/Lon 37.09/-81.76
End Date 2011-06-09 16:56 EST-5
End Location 1NE CEDAR BLUFF
End Lat/Lon 37.09/-81.76
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Despite being under the influence by an area of high pressure, enough ridge top convergence of winds took place to help facilitate the development of isolated to scattered thunderstorms. A number of these storms reached severe levels with large hail and damaging winds.

Event Hail
Magnitude 1.25 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Post Office
NCEI Data Source CSV
Begin Date 2011-06-09 17:00 EST-5
Begin Location 2WSW MALDEN SPGS
Begin Lat/Lon 37.02/-81.73

End Date 2011-06-09 17:00 EST-5
End Location 2WSW MALDEN SPGS
End Lat/Lon 37.02/-81.73
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Despite being under the influence by an area of high pressure, enough ridge top convergence of winds took place to help facilitate the development of isolated to scattered thunderstorms. A number of these storms reached severe levels with large hail and damaging winds.
Event Narrative The hail occurred at the Ponding Mill Post Office.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Post Office
NCEI Data Source CSV
Begin Date 2011-06-09 17:00 EST-5
Begin Location 2WSW MALDEN SPGS
Begin Lat/Lon 37.02/-81.73
End Date 2011-06-09 17:00 EST-5
End Location 2WSW MALDEN SPGS
End Lat/Lon 37.02/-81.73
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.50K
Crop Damage
Episode Narrative Despite being under the influence by an area of high pressure, enough ridge top convergence of winds took place to help facilitate the development of isolated to scattered thunderstorms. A number of these storms reached severe levels with large hail and damaging winds.
Event Narrative Numerous large tree limbs were blown down at the Ponding Mill Post Office. Damage values are estimated.

Event Hail
Magnitude 1.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-06-28 13:48 EST-5
Begin Location 1WNW POCAHONTAS
Begin Lat/Lon 37.31/-81.37
End Date 2011-06-28 13:48 EST-5
End Location 1WNW POCAHONTAS
End Lat/Lon 37.31/-81.37
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A cold front swept through the region on the 28th. Multiple clusters of storms accompanied the front as it progressed. Some of these storms increased to severe levels and produced large hail and damaging winds.
Event Narrative

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK

Report Source State Official
NCEI Data Source CSV
Begin Date 2011-06-28 14:24 EST-5
Begin Location 1SE ADRIA
Begin Lat/Lon 37.16/-81.54
End Date 2011-06-28 14:24 EST-5
End Location 1SE ADRIA
End Lat/Lon 37.16/-81.54
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 4.50K
Crop Damage 0.00K
Episode Narrative A cold front swept through the region on the 28th. Multiple clusters of storms accompanied the front as it progressed. Some of these storms increased to severe levels and produced large hail and damaging winds.
Event Narrative Thunderstorm winds blew trees down on Adria Road. Damage values are estimated.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source State Official
NCEI Data Source CSV
Begin Date 2011-07-22 15:30 EST-5
Begin Location 1NE CEDAR BLUFF
End Date 2011-07-22 16:30 EST-5
End Location 1N CEDAR BLUFF
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A weak upper level storm system moved across the area during the afternoon, and combined with daytime heating, ignited thunderstorms across northwest North Carolina and up into Virginia, in the vicinity of the Blue Ridge. Enough instability existed for some of these storms to become severe. Enough moisture was present, and storm motion was slow enough, to also bring very heavy rain from these storms.
Event Narrative Heavy rains of between 2 and 4 inches in a few hours caused Cedar Valley Drive to be closed due to flooding.

Event Hail
Magnitude 0.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2011-08-14 13:43 EST-5
Begin Location 1E RICHLANDS
Begin Lat/Lon 37.1/-81.8
End Date 2011-08-14 13:43 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed along a cold front and along a trough of low pressure east of the mountains in the afternoon. These storms produced some large hail, damaging winds and heavy rains.
Event Narrative

Event Hail
Magnitude 1.00 in.

State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-08-14 14:00 EST-5
Begin Location 1SW BUSTHEAD
Begin Lat/Lon 37.09/-81.73
End Date 2011-08-14 14:02 EST-5
End Location 1SW BUSTHEAD
End Lat/Lon 37.09/-81.73
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed along a cold front and along a trough of low pressure east of the mountains in the afternoon. These storms produced some large hail, damaging winds and heavy rains.
Event Narrative

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2011-08-14 14:00 EST-5
Begin Location 1SW BUSTHEAD
Begin Lat/Lon 37.09/-81.73
End Date 2011-08-14 14:00 EST-5
End Location 1SW BUSTHEAD
End Lat/Lon 37.09/-81.73
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Thunderstorms developed along a cold front and along a trough of low pressure east of the mountains in the afternoon. These storms produced some large hail, damaging winds and heavy rains.
Event Narrative Quarter hail fell near Richlands.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-02-19 09:55 EST-5
End Date 2012-02-20 00:15 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative The first significant, and overdue, winter storm of the 2011-2012 winter season developed over the central Appalachian region on Sunday, February 19, 2012. Temperatures had been unseasonably warm in the days leading up to the event, resulting in warm ground conditions. It took a timely combination of colder air filtering back into the region from the north throughout the day Sunday, and then heavier bands of precipitation moving across the region late enough in the afternoon and into the evening, to get snow to begin sticking in earnest. At the conclusion, a generous swath of five to eight inches of snow fell across most of the forecast area in Virginia, with some localized nine inch amounts. Areas of southside Virginia the NC border received less snow, more on the order of three to four inches.
Event Narrative A total of 5.5 inches of snow fell in Richlands.

Event **Hail**
Magnitude **0.75 in.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Public**
NCEI Data Source **CSV**
Begin Date **2012-03-02 11:53 EST-5**
Begin Location **1SSW BLUEFIELD**
Begin Lat/Lon **37.23/-81.29**
End Date **2012-03-02 11:53 EST-5**
End Location **1SSW BLUEFIELD**
End Lat/Lon **37.23/-81.29**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **Storms developed ahead of a warm front over the Tennessee Valley with a some cells producing copious amounts of dime to penny-size hail.**
Event Narrative Hail reached dime to penny size and covered the ground. Plows were required to clear the roads in Bluefield.

Event **Frost/Freeze**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **COOP Observer**
NCEI Data Source **CSV**
Begin Date **2012-03-27 04:00 EST-5**
End Date **2012-03-27 07:00 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage
Episode Narrative **Weeks of abnormally warm March temperatures caused an early start to the growing season which was followed by a sharp frost/freeze on the morning of March 27th as a ridge of cool high pressure settled across the region. Some crop damage was reported, mainly to orchards and vineyards.**
Event Narrative Minimum temperatures ranged from 26 to 32 degrees across much of the county.

Event **Flood**
-- Flood Cause **Heavy Rain**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **County Official**
NCEI Data Source **CSV**
Begin Date **2012-04-26 10:51 EST-5**
Begin Location **1SSE RICHLANDS**
Begin Lat/Lon **37.0923/-81.816**
End Date **2012-04-26 15:51 EST-5**
End Location **1SE RICHLANDS**
End Lat/Lon **37.0933/-81.814**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **What began as an unseasonably cold, even snowy week for late April, ended with very heavy rain, especially across southeast West Virginia and southwest Virginia. The front that brought the very cold weather to the region early in the week was returning north of a warm front on the 26th. This, combined with a strong upper-level disturbance tracking across the Ohio Valley and an influx of Gulf moisture, set the stage for the development of**

showers and thunderstorms . Rainfall amounts across much of southeast West Virginia and southwest Virginia were in the 1.0 to 2.0 inch range for the 24-hour period from midnight Thursday April 26th to midnight Friday April 27th. However, the most significant rainfall fell across areas of southwest Virginia, west of I-77, and in southeast West Virginia. In these areas, several locations received rainfall of 2.0 to 3.0 inches in the 24-hour period ending at midnight June 27th, with parts of Bland county receiving in excess of 5.0 inches of rain.
During the afternoon and evening, scattered showers and thunderstorms redeveloped across southeast West Virginia and southwest Virginia in an increasingly warm, humid air mass. Some of these became severe producing quarter to ping-pong ball-sized hail.
Event Narrative The Tazewell County 911 Center reported that Barrett Street in downtown Richlands was completely flooded. Rainfall of 3 to 5 inches was reported in the area during the 24-hr period from midnight on the 26th to midnight on the 27th, the heaviest of which fell during the early to mid-morning hours of the 26th. No road or structural damage was reported as a result of the flooding.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-04-26 18:05 EST-5
Begin Location 5NW BLUEFIELD
Begin Lat/Lon 37.3012/-81.3443
End Date 2012-04-26 18:05 EST-5
End Location 5NW BLUEFIELD
End Lat/Lon 37.3012/-81.3443
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative What began as an unseasonably cold, even snowy week for late April, ended with very heavy rain, especially across southeast West Virginia and southwest Virginia. The front that brought the very cold weather to the region early in the week was returning north of a warm front on the 26th. This, combined with a strong upper-level disturbance tracking across the Ohio Valley and an influx of Gulf moisture, set the stage for the development of showers and thunderstorms . Rainfall amounts across much of southeast West Virginia and southwest Virginia were in the 1.0 to 2.0 inch range for the 24-hour period from midnight Thursday April 26th to midnight Friday April 27th. However, the most significant rainfall fell across areas of southwest Virginia, west of I-77, and in southeast West Virginia. In these areas, several locations received rainfall of 2.0 to 3.0 inches in the 24-hour period ending at midnight June 27th, with parts of Bland county receiving in excess of 5.0 inches of rain.
During the afternoon and evening, scattered showers and thunderstorms redeveloped across southeast West Virginia and southwest Virginia in an increasingly warm, humid air mass. Some of these became severe producing quarter to ping-pong ball-sized hail.
Event Narrative A trained storm spotter observed penny to quarter-sized hail approximately five miles northwest of Bluefield, Virginia.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source County Official
NCEI Data Source CSV
Begin Date 2012-04-26 18:45 EST-5
Begin Location 2NNE MUD FORK
Begin Lat/Lon 37.2473/-81.4528
End Date 2012-04-26 18:45 EST-5
End Location 2NNE MUD FORK
End Lat/Lon 37.2473/-81.4528
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K

Crop Damage 0.00K
Episode Narrative What began as an unseasonably cold, even snowy week for late April, ended with very heavy rain, especially across southeast West Virginia and southwest Virginia. The front that brought the very cold weather to the region early in the week was returning north of a warm front on the 26th. This, combined with a strong upper-level disturbance tracking across the Ohio Valley and an influx of Gulf moisture, set the stage for the development of showers and thunderstorms . Rainfall amounts across much of southeast West Virginia and southwest Virginia were in the 1.0 to 2.0 inch range for the 24-hour period from midnight Thursday April 26th to midnight Friday April 27th. However, the most significant rainfall fell across areas of southwest Virginia, west of I-77, and in southeast West Virginia. In these areas, several locations received rainfall of 2.0 to 3.0 inches in the 24-hour period ending at midnight June 27th, with parts of Bland county receiving in excess of 5.0 inches of rain.
During the afternoon and evening, scattered showers and thunderstorms redeveloped across southeast West Virginia and southwest Virginia in an increasingly warm, humid air mass. Some of these became severe producing quarter to ping-pong ball-sized hail.
Event Narrative The Tazewell County 911 Center relayed a report of quarter-sized hail from the Abbs Valley area near the West Virginia state line.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2012-05-22 16:30 EST-5
Begin Location 1WSW BLUEFIELD
Begin Lat/Lon 37.245/-81.2992
End Date 2012-05-22 18:30 EST-5
End Location 1WNW BLUEFIELD
End Lat/Lon 37.2548/-81.2969
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Scattered showers and thunderstorms developed across portions of central and southwest Virginia and southeast West Virginia due to weak shortwave troughs passing over the area ahead of an approaching cold front. Strong daytime heating across the piedmont area of Virginia, with highs reaching into the upper 80s and lower 90s, aided in destabilizing the atmosphere. Weak upper level winds kept these storms more pulse-variety in nature.
Event Narrative Multiple roads across the city of Bluefield were closed due to flooding.

Event Thunderstorm Wind
Magnitude 65 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2012-06-29 19:34 EST-5
Begin Location 0N POCAHONTAS
Begin Lat/Lon 37.3/-81.35
End Date 2012-06-29 19:44 EST-5
End Location 0N MC CALL PLACE
End Lat/Lon 37.18/-81.6
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 400.00K
Crop Damage
Episode Narrative A derecho of historic proportion rolled through the region and caused widespread, significant damage. Numerous power outages occurred. Some customers were without power for 12 days which coincided with a prolonged period of excessive heat. The derecho had its origin around Chicago, Illinois around 1:00 pm EST. By 7:00 pm EST the derecho had reached southeast West Virginia. Only two hours later, it was pushing through Southside

Virginia. By midnight EST it had reached the Atlantic coast.
Event Narrative Thunderstorm winds blew hundreds of trees down across the county. A combination of the winds and the falling trees brought down many power lines. Damage values are estimated.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2012-06-30 17:45 EST-5
Begin Location 0N BURKES GARDEN
Begin Lat/Lon 37.1/-81.35
End Date 2012-06-30 17:45 EST-5
End Location 0N BURKES GARDEN
End Lat/Lon 37.1/-81.35
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A passing upper level disturbance interacted with a very unstable atmosphere near the surface to generate scattered large hail producing thunderstorms. Some of these were accompanied by damaging winds.
Event Narrative

Event Hail
Magnitude 1.25 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-06-30 18:04 EST-5
Begin Location 1E BUSTHEAD
Begin Lat/Lon 37.1/-81.71
End Date 2012-06-30 18:04 EST-5
End Location 1E BUSTHEAD
End Lat/Lon 37.1/-81.71
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A passing upper level disturbance interacted with a very unstable atmosphere near the surface to generate scattered large hail producing thunderstorms. Some of these were accompanied by damaging winds.
Event Narrative Hail ranged from quarter to ping pong ball size along Indian Creek Rd.

Event Hail
Magnitude 2.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-06-30 18:40 EST-5
Begin Location 1SSW ADRIA
Begin Lat/Lon 37.15/-81.56
End Date 2012-06-30 19:00 EST-5
End Location 1S FOURWAY
End Lat/Lon 37.12/-81.5

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 50.00K
Crop Damage
Episode Narrative A passing upper level disturbance interacted with a very unstable atmosphere near the surface to generate scattered large hail producing thunderstorms. Some of these were accompanied by damaging winds.
Event Narrative Hail ranged from quarter size to hens egg size for a duration of twenty minutes from three miles northwest of Tazewell to one mile east-northeast of Tazewell. The hail caused damage to vehicles. Damage values are estimated.

Event Hail
Magnitude 1.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-06-30 19:07 EST-5
Begin Location 1NE GRATTON
Begin Lat/Lon 37.14/-81.41
End Date 2012-06-30 19:07 EST-5
End Location 1NE GRATTON
End Lat/Lon 37.14/-81.41
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A passing upper level disturbance interacted with a very unstable atmosphere near the surface to generate scattered large hail producing thunderstorms. Some of these were accompanied by damaging winds.
Event Narrative

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-01 09:30 EST-5
Begin Location 1SW DORAN
Begin Lat/Lon 37.09/-81.86
End Date 2012-07-01 09:30 EST-5
End Location 1SW DORAN
End Lat/Lon 37.09/-81.86
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative

Event Hail
Magnitude 1.75 in.

State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-07-01 09:32 EST-5
Begin Location 1SE DORAN
Begin Lat/Lon 37.093/-81.844
End Date 2012-07-01 09:40 EST-5
End Location 1NW CEDAR BLUFF
End Lat/Lon 37.0903/-81.7815
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Hail was reported at several locations around Richlands during about a 8-minute period and ranged in size from 1 inch up to 1.75 inches in diameter.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-01 09:40 EST-5
Begin Location 5SSE RICHLANDS
Begin Lat/Lon 37.0331/-81.7853
End Date 2012-07-01 09:40 EST-5
End Location 5SSE RICHLANDS
End Lat/Lon 37.0331/-81.7853
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Quarter size hail fell 5 miles south-southeast of Richlands.

Event Hail
Magnitude 1.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-07-01 09:40 EST-5
Begin Location 1E CLAYPOOL HILL
Begin Lat/Lon 37.07/-81.76

End Date 2012-07-01 09:40 EST-5
End Location 1E CLAYPOOL HILL
End Lat/Lon 37.07/-81.76
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-01 09:45 EST-5
Begin Location 3NE CLIFFIELD
Begin Lat/Lon 37.1307/-81.6315
End Date 2012-07-01 09:45 EST-5
End Location 3NE CLIFFIELD
End Lat/Lon 37.1307/-81.6315
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Several trees were blown down by thunderstorm winds.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-07-01 09:45 EST-5
Begin Location 6SSW PUCKETTS STORE
Begin Lat/Lon 36.9578/-81.6475
End Date 2012-07-01 09:45 EST-5
End Location 6SSW PUCKETTS STORE
End Lat/Lon 36.9578/-81.6475
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the

remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Thunderstorm winds blew down a large tree limb which fell on a car on Freestone Valley Road and smashed the windshield. People inside the car were uninjured.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-07-01 22:00 EST-5
Begin Location 1E RICHLANDS
Begin Lat/Lon 37.1/-81.8
End Date 2012-07-01 22:05 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Multiple trees were reported down in Richlands.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2012-07-01 22:05 EST-5
Begin Location 0N TAZEWELL
Begin Lat/Lon 37.12/-81.52
End Date 2012-07-01 22:05 EST-5
End Location 0N TAZEWELL
End Lat/Lon 37.12/-81.52
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.
Event Narrative Multiple trees were reported down in Tazewell.

Event **Thunderstorm Wind**
Magnitude **55 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **COOP Observer**
NCEI Data Source **CSV**
Begin Date **2012-07-01 22:25 EST-5**
Begin Location **1SE BURKES GARDEN**
Begin Lat/Lon **37.09/-81.34**
End Date **2012-07-01 22:25 EST-5**
End Location **1SE BURKES GARDEN**
End Lat/Lon **37.09/-81.34**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **8.00K**
Crop Damage **0.00K**
Episode Narrative **A broad ridge over the central U.S. set the stage for scattered to numerous severe storms that developed in the early morning and persisted much of the day and into the night. The storms were triggered by the remains of a mesoscale convective system (MCS) that dropped southeast across the southern Appalachians in the morning hours while strong surface heating created a very unstable air mass as the day progressed. Strong wind shear, steep lapse rates and instability that was approaching 3000 J/kg by mid-morning contributed to the intensity of the storms. The Mountain Empire, New River Valley and Southside Virginia saw most of the activity which featured mainly severe, damaging high winds but also some hail.**
Event Narrative **Several large trees were knocked down in the Burkes Garden area, one landing on a house and another on a car.**

Event **Thunderstorm Wind**
Magnitude **55 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Public**
NCEI Data Source **CSV**
Begin Date **2012-07-05 13:24 EST-5**
Begin Location **1E RICHLANDS**
Begin Lat/Lon **37.1/-81.8**
End Date **2012-07-05 13:30 EST-5**
End Location **1NE CEDAR BLUFF**
End Lat/Lon **37.0875/-81.7592**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **1.20K**
Crop Damage **0.00K**
Episode Narrative **Several upper level storm systems rotating around an upper high centered over the mid-Mississippi Valley helped to generate severe thunderstorms across the mountains. The convective activity was initiated out of the remains of a nocturnal Mesoscale Convective System (MCS) over the Ohio Valley that encountered increasing shear and instability as it moved into the southern Appalachians.**
Event Narrative **Tree reported down across road at Richlands High School and a power outage reported in town. Trees were also toppled in Cedar Bluff.**

Event **Thunderstorm Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **911 Call Center**
NCEI Data Source **CSV**
Begin Date **2012-07-05 13:26 EST-5**
Begin Location **0N THOMPSON VLY**
Begin Lat/Lon **37.08/-81.55**

End Date **2012-07-05 13:26 EST-5**
End Location **0N THOMPSON VLY**
End Lat/Lon **37.08/-81.55**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **1.20K**
Crop Damage **0.00K**
Episode Narrative **Several upper level storm systems rotating around an upper high centered over the mid-Mississippi Valley helped to generate severe thunderstorms across the mountains. The convective activity was initiated out of the remains of a nocturnal Mesoscale Convective System (MCS) over the Ohio Valley that encountered increasing shear and instability as it moved into the southern Appalachians.**
Event Narrative Multiple trees down in Thompson Valley.

Event **Heavy Rain**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **County Official**
NCEI Data Source **CSV**
Begin Date **2012-07-24 14:00 EST-5**
Begin Location **2W SEABOARD**
Begin Lat/Lon **37.132/-81.8289**
End Date **2012-07-24 18:00 EST-5**
End Location **1SSE CLIFFIELD**
End Lat/Lon **37.0827/-81.6614**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **Northwesterly flow aloft interacted with a frontal zone and an extremely warm and unstable air mass to bring strong storms to the mountains. Rainfall was also quite heavy with 2 to 3 inch amounts falling across in western Tazewell County. Minor flooding occurred as a result of the rains.**
Event Narrative Rainfall of 2 to 3 inches in several hours fell across the western sections of the county as several bands of precipitation dropped southeast from the Ohio Valley.

Event **Thunderstorm Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **911 Call Center**
NCEI Data Source **CSV**
Begin Date **2012-07-25 00:57 EST-5**
Begin Location **6SSE MALDEN SPGS**
Begin Lat/Lon **36.95/-81.66**
End Date **2012-07-25 00:57 EST-5**
End Location **6SSE MALDEN SPGS**
End Lat/Lon **36.95/-81.66**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.60K**
Crop Damage **0.00K**
Episode Narrative **Northwesterly flow aloft interacted with a frontal zone and an extremely warm and unstable air mass to bring strong storms to the mountains. Rainfall was also quite heavy with 2 to 3 inch amounts falling across in western Tazewell County. Minor flooding occurred as a result of the rains.**
Event Narrative Two large trees were brought down at the intersection of Freestone Valley and Veterans Road.

Event **Flash Flood**
-- Flood Cause **Heavy Rain**
State **VIRGINIA**
County/Area **TAZEWELL**

WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-07-31 15:08 EST-5
Begin Location 1SE DORAN
End Date 2012-07-31 16:08 EST-5
End Location 1WSW RICHLANDS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A slow-moving thunderstorm drifted across western Tazewell County with very heavy rainfall in the town of Richlands and vicinity. Doppler radar estimated 2 to 3 inches of rain fell in a few hours in and around Richlands. Several roads were flooded and small creeks left their banks. Rain gauge reports for the 24-hours ending at 8 AM EDT on August 1st, included: Richlands 2.51, Richlands COOP 2.30 and Xmas Tree Hill IFLOWS 2.26.
Event Narrative Pockets of urban type flash flooding were reported around Richlands including 6 to 8 inches of water across Route 460 at the west end of Richlands. Other reports included spotter on Eagle Street reporting that water rose several feet in small creek and overflowed a walk bridge on neighbors property. Bragg Road wasclosed due to flooding with 6 to 12 inches of water was flowing over the road. Another spotter reported Route 609 in Richlands closed due to 1 to 2 feet of water flowing over road.

Event Strong Wind
Magnitude 39 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2012-09-18 03:30 EST-5
End Date 2012-09-18 03:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative Heavy rain occurred across the entire forecast area, but particularly across the mountains, as a low pressure system passed rapidly northward from the gulf coast through Kentucky and West Virginia. This low brought with it unusually high amounts of moisture from the Gulf of Mexico, with the 18/12Z upper air sounding for KRNK observing 1.69 inches of precipitable water, and the 18/12Z upper air sounding from KGSP observing 1.92 inches, values for both locations being around 2 standard deviations above normal for mid-September. Anywhere from 2 to 5 inches total rainfall accumulation was observed for the passage of this system with the eastern facing slope receiving the highest rainfall amounts. Despite the heavy widespread rainfall however, very few locations experienced anything more than brief periods of nuisance flooding/high water issues because there had been very little rainfall for the past several weeks leading up to the event.
Event Narrative Two trees were blow down at East Mountain along U.S. Highway 460.

Event Hail
Magnitude 0.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2012-10-18 16:05 EST-5
Begin Location 1E FOURWAY
Begin Lat/Lon 37.13/-81.49
End Date 2012-10-18 16:15 EST-5
End Location 1E FOURWAY
End Lat/Lon 37.13/-81.49
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **Thunderstorms developed in advance of an approaching cold front. One of these storms became large enough to produce hail.**
Event Narrative

Event **Winter Storm**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Public**
NCEI Data Source **CSV**
Begin Date **2012-10-28 21:15 EST-5**
End Date **2012-10-31 11:09 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **Hurricane Sandy moved north off the Atlantic Coast and combined with a complex low pressure system and deepening trough over the eastern part of the U.S., and then turned west northwest and into New Jersey into Pennsylvania, slowing down and then drifting north. It produced an expansive area of high impact weather as it approached the coast and moved inland. Strong winds and heavy snowfall were the biggest impacts on southeastern West Virginia, northwestern North Carolina and extreme southwestern Virginia, lasting for 24-48 hours. One to two feet of snow with significant drifting was observed in the higher elevations, with a sharp reduction to little or no accumulation in the valleys. Winds gusted into the 50-60 mph range.**
Event Narrative **The higher snow totals for the county include 8.4 inches at Burkes Garden, 9.0 inches at Richlands, 10.0 inches at Tazewell, and 14.5 inches at a location two miles north of Tazewell.**

Event **High Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Post Office**
NCEI Data Source **CSV**
Begin Date **2012-10-30 06:00 EST-5**
End Date **2012-10-30 06:00 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **5.00K**
Crop Damage
Episode Narrative **Hurricane Sandy moved north off the Atlantic Coast and combined with a complex low pressure system and deepening trough over the eastern part of the U.S., and then turned west northwest and into New Jersey into Pennsylvania, slowing down and then drifting north. It produced an expansive area of high impact weather as it approached the coast and moved inland. Strong winds and heavy snowfall were the biggest impacts on southeastern West Virginia, northwestern North Carolina and extreme southwestern Virginia, lasting for 24-48 hours. One to two feet of snow with significant drifting was observed in the higher elevations, with a sharp reduction to little or no accumulation in the valleys. Winds gusted into the 50-60 mph range.**
Event Narrative **Several trees were blown down in the Richlands area. There were a total of 2228 power outages. Damage values are estimated.**

Event **High Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Trained Spotter**
NCEI Data Source **CSV**
Begin Date **2012-12-20 07:30 EST-5**
End Date **2012-12-20 12:50 EST-5**

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative An intense upper low was rotating through the mid-Atlantic region during the period. An equally intense surface low and occluded front was located across the eastern Ohio valley. As the low pressure area approached the region from the west early on the 20th, very strong, gusty southeast winds developed across the higher elevations of southwest Virginia and northwest North Carolina. This resulted in some minor tree damage in Tazewell county Virginia. As the system moved to the north and east of the region, very strong, gusty northwest winds developed and persisted for an extended period across the western part of the Blacksburg forecast area from late on the afternoon of the 21st through much of the 22nd. However, the strongest winds, with gusts of 50 to 65 mph in southwest Virginia and northwest North Carolina, occurred during the late evening hours of the 21st and the early morning hours of the 22nd. Winds gusts of 40 to 50 mph were common. The strong upslope winds also resulted in a persistent snowfall across the upslope areas of the Alleghanys through southwest West Virginia and the mountains of northwest North Carolina.
Below is a sample of some of the highest wind gusts recorded from southwest Virginia counties. If no data is given, the county either did not have winds exceeding 35 mph or did not have a wind reporting station.
Bath county (HSP AWOS, 12/21/12, 955 pm EST) - 59 mph Bedford county (4SSE Buchanan, 12/22/12, 752 am EST) - 41 mph, Botetourt county (6W Fincastle, 12,21,12, 1035 pm EST) - 39 mph, Carroll county (Galax AWOS, 12/22,12, 135 am EST) - 43 mph, Franklin county (3SSW Stewartsville, 12/22/12, 325 am EST) - 39 mph, Henry county (MTV AWOS, 12/22/12, 335 am EST) - 35 mph, Montgomery county (BCB AWOS, 12/22/12, 455 am EST) - 54 mph, Pittsylvania county (3E Mountain Valley, 12/22/12, 312 am EST) - 35 mph, Pulaski county (PSK AWOS, 12/22/12, 255 am EST) - 47 mph, Radford city (2SSE Walton, 12/21/12, 1039 pm EST) - 38 mph, Roanoke city (ROA ASOS, 12/21/12, 1054 pm EST) - 47 mph Roanoke county (Bent Mountain, 12/21/12, 1117 pm EST) - 49 mph, Rockbridge county (6SSE Millboro, 12/22/12, 514 am EST) - 40 mph, Smyth county (MKJ AWOS, 12/21/12, 1035 pm EST) - 58 mph, Wythe county (2E Wytheville, 12/21/12, 1047 pm EST) - 46 mph.
Event Narrative A SkyWarn spotter reported that some large tree limbs were down at the intersection of Dogwood Road and Steeles Lane just south-southwest of Benbolt. This event occurred around 730 am EST. At 1250 pm EST, more tree limbs were blown down in the same area at the intersection of Painter Street and Dogwood Road.

Event High Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-12-26 08:45 EST-5
End Date 2012-12-26 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative A series of deep upper low pressure systems and associated intense surface lows tracked across the region during the last two weeks of December bringing winter weather and strong to high winds to southwest Virginia, southeast West Virginia, the adjacent Allegheny Highlands of Virginia, and northwest North Carolina. Several surface lows tracked from the week before Christmas through the final days of the year in a similar path from the Tennessee Valley across southwest Virginia and/or southeast West Virginia, then toward the mid-Atlantic region. As the surface low pressure areas intensified off the mid-Atlantic coast, very strong, gusty northwest winds developed across the region, especially across southwest Virginia and northwest North Carolina. Sustained winds of 25 to 35 mph with gusts in excess of 50 mph were common from the evening of the 26th through the early morning hours of the 27th. The strong winds blew down a number of trees, many onto power lines and some onto roads, resulting in scattered power outages throughout the region. Here are some sample wind gusts measured from various weather stations across southwest Virginia and the date/time that they occurred. Note, counties not listed either do not have reporting stations or had wind gusts reported or measured of less than 35 mph.
Bedford County (4SSE Buchanan): 12/27/12, 512 am EST, 35 mph, Botetourt County (6W Fincastle): 12/27/12, 1215 am EST, 36 mph, Carroll County (HLX AWOS): 12/26/12, 1155 pm EST, 44 mph, Franklin County (3SW Moneta): 12/27/12, 813 am EST, 36 mph, Montgomery County (BCB AWOS): 12/27/12, 235 am EST, 48 mph, Pulaski County (PSK AWOS): 12/27/12, 1235 am EST, 41 mph, Roanoke City (ROA ASOS): 12/27/12, 454 am EST, 48 mph, Roanoke County (VDOT ROA): 12/27/12, 642 am EST, 36 mph, Rockbridge County (6SSE Millboro): 12/27/12, 459 am EST, 41 mph, Smyth County (Marion/Wytheville AWOS): 12/27/12, 155 am EST, 45 mph, Wythe County (VDOT 2E

Wytheville): 12/27/12, 326 am EST, 45 mph.
Event Narrative Trees were blown down in the Thompson Valley Area at 0845 EST on the 26th, and several large tree limbs were blown down near Tazewell at 1130 EST on the 26th.

Event High Wind
Magnitude 57 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2012-12-27 00:16 EST-5
End Date 2012-12-27 00:16 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A series of deep upper low pressure systems and associated intense surface lows tracked across the region during the last two weeks of December bringing winter weather and strong to high winds to southwest Virginia, southeast West Virginia, the adjacent Allegheny Highlands of Virginia, and northwest North Carolina. Several surface lows tracked from the week before Christmas through the final days of the year in a similar path from the Tennessee Valley across southwest Virginia and/or southeast West Virginia, then toward the mid-Atlantic region. As the surface low pressure areas intensified off the mid-Atlantic coast, very strong, gusty northwest winds developed across the region, especially across southwest Virginia and northwest North Carolina. Sustained winds of 25 to 35 mph with gusts in excess of 50 mph were common from the evening of the 26th through the early morning hours of the 27th. The strong winds blew down a number of trees, many onto power lines and some onto roads, resulting in scattered power outages throughout the region. Here are some sample wind gusts measured from various weather stations across southwest Virginia and the date/time that they occurred. Note, counties not listed either do not have reporting stations or had wind gusts reported or measured of less than 35 mph.
Bedford County (4SSE Buchanan): 12/27/12, 512 am EST, 35 mph, Botetourt County (6W Fincastle): 12/27/12, 1215 am EST, 36 mph, Carroll County (HLX AWOS): 12/26/12, 1155 pm EST, 44 mph, Franklin County (3SW Moneta): 12/27/12, 813 am EST, 36 mph, Montgomery County (BCB AWOS): 12/27/12, 235 am EST, 48 mph, Pulaski County (PSK AWOS): 12/27/12, 1235 am EST, 41 mph, Roanoke City (ROA ASOS): 12/27/12, 454 am EST, 48 mph, Roanoke County (VDOT ROA): 12/27/12, 642 am EST, 36 mph, Rockbridge County (6SSE Millboro): 12/27/12, 459 am EST, 41 mph, Smyth County (Marion/Wytheville AWOS): 12/27/12, 155 am EST, 45 mph, Wythe County (VDOT 2E Wytheville): 12/27/12, 326 am EST, 45 mph.
Event Narrative A wind gust of 66 MPH was measured from a handheld anemometer one mile northwest of Richlands.

Event Heavy Snow
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2013-01-17 12:35 EST-5
End Date 2013-01-17 20:55 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A deep low pressure system tracked from northern Georgia to the North Carolina coast. Warm air in the low levels allowed precipitation to fall initially as rain, however cold air wrapping around the west side of the low caused rain to change over to a brief period of intense sleet, before changing over to snow across the mountains during the afternoon, and across the piedmonts during the evening. Snowfall rates were at times 2 to 3 inches per hour for some locations. Snowfall came to an end quickly from west to east during late evening as drier air aloft moved into the area. Heaviest snowfall accumulations were observed in the mountains due to the longer residence time of colder air, however the piedmont region experienced less snowfall due to warmer air lingering across the area longer, resulting in only a brief but intense burst of snowfall just as the system was exiting the area.
The following is a list of total snowfall reports, in inches, from across Virginia.
- Alleghany County - 4 E Covington: 3.0, 1 NW Falling Spring: 3.0, 4 E Covington City: 3.0, 1 WNW Falling Spring:

3.0, 1 WSW Idlewilde: 2.2, 1 NNE Selma: 2.2, 1 W Natural Well: 2.0, Selma: 2.0.
- Amherst County - Alto: 7.0, Pedlar: 0.5, Monroe: 0.2.
- Appomattox County - Appomattox: 4.6, Stonewall: 4.6, Pamplin: 4.0, 2 SE Chap: 3.5, 9 E Lynchburg: 1.5.
- Bath County - Chimney Run: 2.0, Warm Springs: 2.0, 2 SSW Mountain Grove: 1.0, Millboro: 1.0, Hot Springs: 1.0, 1 SE Millboro Spring: 1.0, 1 SSW Douthat S.P.: 0.5.
- Bedford County - 2 NW Reba: 7.5, Huddleston: 4.0, Stewartsville: 2.3,, Forest: 2.0.
- Bland County - Rocky Gap: 12.0, 5 W Bland: 11.0, Bastian: 8.5, 1 N Ceres: 6.0.
- Botetourt County - Nace: 8.0, Troutville: 8.0, 2 S Buchanan: 7.5, Blue Ridge: 6.5, 3 N Daleville: 6.0, Laymantown: 4.7, Buchanan: 3.4.
- Buckingham County - 1 E Wingina: 5.5, 2 NNE Tower Hill: 3.5, Dillwyn: 3.3, 3 SSE Sheppards: 3.0, New Canton: 2.5, Buckingham: 2.5, 2 NNE Bent Creek: 2.0, 4 SE Rosney: 2.0.
- Campbell County - 1 E Happy Valley: 3.5, Concord: 3.2, Naruna: 3.0, 3 E Brookneal: 2.2, Evington: 2.0, Lynch Station: 1.5, 1 N Pine Ridge: 1.0, Brookneal: 0.7.
- Carroll County - Hillsville: 10.5, Hebron: 10.0, 1 N Fancy Gap: 8.5, 7 SE Galax: 8.0, Dugspur: 5.0.
- Charlotte County - 1 WSW Taro: 7.0, Charlotte Court House: 4.0, Redoak: 3.8 4 SE Saxe: 3.5, 3 NNE Aspen: 2.0.
- City of bedford - Bedford: 1.0.
- City of buena vista - Buena Vista: 5.0.
- City of galax - Galax: 10.0.
- City of lexington - Lexington: 2.6, West Lexington: 1.5.
- City of lynchburg - 1 SSW Richland Hills: 4.0, Lynchburg: 2.0.
- City of martinsville - Martinsville: 2.0.
- City of radford - Radford: 6.0.
- City of roanoke - Edgehill Estates: 7.3,, Roanoke: 5.0, Carter Heights: 4.0,
- Craig County - 1 SSE Valley Mill: 8.0, Simmonsville: 3.5.
- Floyd County - 2 SE Willis: 12.1, Indian Valley: 11.5, Copper Hill: 9.5, Floyd: 7.8, Check: 7.0, Alum Ridge: 7.0, Terrys fork: 0.5.
- Franklin County - Callaway: 6.0, 4 W Rocky Mount: 5.5, Redwood: 4.0, Ferrum: 4.0, Boones Millaway: 3.5, 1 N Henry: 3.0, Rocky Mount: 3.0, Hardy Ford: 1.5, 1 ENE Burnt Chimney: 1.2, 1 ENE Penhook: 1.2, Burnt Chimney: 1.0.
- Giles County - Glen Lyn: 13.0, Rich Creek: 12.5, Narrows: 12.0, Pearisburg: 10.0, 3 WNW Newport: 9.5, W Pearisburg: 9.0, Maybrook: 9.0, Newport: 6.5, Pembroke: 6.3,, Prospectdale: 4.0.
- Grayson County - 4 SW Galax City: 12.0, Fries: 11.5, Elk Creek: 11.0, 1 ESE Fries: 8.0, Independence: 2.0.
- Halifax County - Alton: 2.5, Halifax: 2.5, Virgilina: 2.5, High Rock: 2.0, 2 SE South Boston: 2.0, Nathalie: 2.0, South Boston: 1.5.
- Henry County - Fieldale: 3.5, Ridgeway: 2.3,, Spencer: 2.0, 1 SSW Lithia Springs: 2.0, Axton: 1.7, 1 SW Bassett: 1.5.
- Montgomery County - 1 NE Laurel Ridge: 9.2, 4 WSW Shawsville: 9.0, 1 ESE Christiansburg: 8.5, 2 SSW Christiansburg: 8.3, N Blacksburg: 7.5, Mountain View: 7.0, Highview Terrace: 7.0, Blacksburg: 7.0, Merrimac: 6.8, Christiansburg: 6.6, 2 NE Blacksburg: 6.5, 2 S Christiansburg: 6.5, 1 E Ellett: 6.0, Lafayette: 4.8, Elliston: 4.2, 3 S Christiansburg: 2.5,
- Patrick County - Meadows of Dan: 7.0, 4 NE Stuart: 4.0, 5 SW Meadows of Dan: 3.5, 10 N Stuart: 3.0, 1 S Patrick Springs: 2.0, Stuart: 0.5, Fairy Stone S.P.: 0.4, 1 E Woolwine: 0.1, 1 S Claudville: T, Claudville: T, Ararat: T.
- Pittsylvania County - 5 SW Chatham: 6.0, Gretna: 4.0, Chatham: 4.0, Whitmell: 3.0, Blairs: 2.6, 1 N Ringgold: 1.5.
- Pulaski County - 2 N Pulaski: 9.0, Dublin: 9.0, 1 NW New River: 7.5, Fairlawn: 7.5, Pulaski: 7.0.
- Roanoke County - Bent Mountain: 10.3, 1 SE Wabun: 4.5, Briar Ridge: 4.3, Sugar Loaf Hills: 4.0, 2 WSW Poages Mill: 1.5.
- Rockbridge County - Natural Bridge: 5.0, Fairfield: 4.5, 2 SSE Riverside: 4.5, Glasgow: 3.5, 2 E Kerrs Creek: 1.8, Goshen: 1.0, Rockbridge Baths: 1.0.
- Smyth County - Marion: 10.2, 1 NW Marion: 10.0, 2 ENE Marion: 9.0, Saltville: 5.0, 1 W McMullin: 3.0.
- Tazewell County - Burkes Garden: 12.0, 1 WNW Bluefield: 12.0, 1 N Paintlick: 8.5, Richlands: 7.9, 1 SSW Lake Park: 7.0, Tazewell: 2.5.
- Wythe County - Wytheville: 11.0, Rural Retreat: 5.5, Austinville: 5.0, Max Meadows: 4.0.
Event Narrative Total snowfall amounts across Tazewell County range from 12.0 inches at Burkes Garden and 1 WNW Bluefield to 2.5 inches at Tazewell.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV

Begin Date 2013-02-26 08:30 EST-5
End Date 2013-02-26 10:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 7.00K
Crop Damage
Episode Narrative A strong pressure gradient developed between low pressure moving into the Great Lakes region and high pressure over New England. The result was very strong southerly winds that brought down a few trees over Tazewell County. A power line was brought down near Tazewell by one of these trees.
Event Narrative High wind gusts brought down four trees across the county. At the Tazewell County Country Club, two miles east of Cliffield, two of these trees fell close to Pounding Mill Branch Road. Another tree fell two miles east of Tiptop along Route 460 near Springville Elementary School. The final tree fell two miles east-northeast of Tazewell along Bulldog Avenue. This tree took down a power line as it fell. Damage values are estimated.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source State Official
NCEI Data Source CSV
Begin Date 2013-05-19 16:17 EST-5
Begin Location 1E RICHLANDS
End Date 2013-05-19 20:00 EST-5
End Location 1NNW CEDAR BLUFF
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative An upper level low pressure system moved from Kentucky across western Virginia, triggering strong thunderstorms during the afternoon and evening. Southeast winds near the surface associated with a departing high pressure wedge fed Atlantic moisture into the Appalachian Mountains, where marginal instability allowed the thunderstorm activity to develop. Very light upper level winds resulted in slow storm movement and therefore prolonged periods of locally heavy rain in areas where soil conditions were already very moist from rainfall in the preceding days.
Event Narrative Multiple roads around the Richlands area were closed due to flooding, including Larimer Lane. Heavy rain also caused nearby streams to rise out of their banks. In addition, some roads were closed due to debris, including one debris flow that blocked Highway 460.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source State Official
NCEI Data Source CSV
Begin Date 2013-05-22 15:00 EST-5
Begin Location 1N PISGAH
End Date 2013-05-22 16:30 EST-5
End Location 1WSW ADRIA
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Widely scattered strong to severe thunderstorms developed during the afternoon and evening due to strong instability associated with an approaching upper level trough and the associated cold front.
Event Narrative Six inches of water and a significant amount of debris washed onto Baptist Valley Road near the 6600 block, causing the road to be closed. Cabbage Creek flooded Adria Road near Route 636.

Event Hail
Magnitude 0.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2013-07-12 18:40 EST-5
Begin Location 1SE RICHLANDS
Begin Lat/Lon 37.09/-81.81
End Date 2013-07-12 18:40 EST-5
End Location 1SE RICHLANDS
End Lat/Lon 37.09/-81.81
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Afternoon convection again bubbled up over southwest Virginia in evening hours of the 12th with very heavy rains over the City of Galax, Grayson and Carroll counties where 2 to 3 inch rains fell. Several flooding reports were received. Several gauges in the Galax area had over 2 inches for the period ending 0700 EDT on the 13th.
Event Narrative

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2013-07-18 14:30 EST-5
Begin Location 1N NORTH TAZEWELL
Begin Lat/Lon 37.14/-81.53
End Date 2013-07-18 14:30 EST-5
End Location 1N NORTH TAZEWELL
End Lat/Lon 37.14/-81.53
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative There was very little strong convection across southwest Virginia with exception of an afternoon cell over western Tazewell County that produced 1-inch diameter hail.
Event Narrative Hail up to quarter size was reported.

Event Thunderstorm Wind
Magnitude 52 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2013-08-12 16:53 EST-5
Begin Location 0N RICHLANDS
Begin Lat/Lon 37.1/-81.82
End Date 2013-08-12 16:53 EST-5
End Location 0N RICHLANDS
End Lat/Lon 37.1/-81.82
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect 0/0
Property Damage 15.00K
Crop Damage 0.00K
Episode Narrative A stationary front to a warm front remain draped across southern Virginia and southern West Virginia. This boundary combined with a persistent moist, unstable air mass across the region served as a focusing mechanism for isolated to scattered afternoon and evening thunderstorm development across the region once again. One thunderstorm developed across Tazewell county during the early evening and quickly became severe blowing the roof off a house and downing at least one large tree.
Event Narrative WOAY Television of Oak Hill, West Virginia reported that thunderstorm winds blew a portion of a roof off a home near Richlands as well as blowing down one tree.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2013-08-12 17:56 EST-5
Begin Location 2SW FROG LEVEL
End Date 2013-08-12 19:56 EST-5
End Location 2SW FROG LEVEL
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A stationary front to a warm front remain draped across southern Virginia and southern West Virginia. This boundary combined with a persistent moist, unstable air mass across the region served as a focusing mechanism for scattered afternoon and evening thunderstorm development across the region once again. As had been the case much of the summer of 2013, heavy rain and flash flooding were once again the main concerns. Thunderstorms across southwest Virginia during the evening prompted several flash flood warnings netting several flash flood events as rainfall of two to four inches fell in flash flood prone areas within a couple of hours.
Event Narrative The public reported that Wittens Valley Road was flooded, presumably by waters from the West Fork of Plum Creek.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2013-08-12 18:00 EST-5
Begin Location 1WNW MOUTH OF LAUREL
End Date 2013-08-12 20:00 EST-5
End Location 1WNW MOUTH OF LAUREL
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A stationary front to a warm front remain draped across southern Virginia and southern West Virginia. This boundary combined with a persistent moist, unstable air mass across the region served as a focusing mechanism for scattered afternoon and evening thunderstorm development across the region once again. As had been the case much of the summer of 2013, heavy rain and flash flooding were once again the main concerns. Thunderstorms across southwest Virginia during the evening prompted several flash flood warnings netting several flash flood events as rainfall of two to four inches fell in flash flood prone areas within a couple of hours.
Event Narrative The Virginia Department of Highways reported that Randy Road was flooded and closed.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2013-08-21 17:56 EST-5
Begin Location 1ESE RICHLANDS
Begin Lat/Lon 37.093/-81.7962
End Date 2013-08-21 17:56 EST-5
End Location 1ESE RICHLANDS
End Lat/Lon 37.093/-81.7962
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.20K
Crop Damage 0.00K
Episode Narrative A weak upper-level trough persisted just to the west of the area. A warm, humid air mass remained in place across the region along with numerous outflow boundaries from earlier convection. A near solid line of thunderstorms was moving into southern West Virginia and far southwest Virginia during the early evening. The tail end of this line produced a severe thunderstorm with damaging wind gusts in Tazewell county before it weakened as it moved further eastward.
Event Narrative The Tazewell County Sheriff's Office reported that two large tree limbs were blown off trees by thunderstorm winds on Front Street in downtown Richlands.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source County Official
NCEI Data Source CSV
Begin Date 2013-09-02 19:52 EST-5
Begin Location 1WNW TIPTOP
End Date 2013-09-02 22:30 EST-5
End Location 1WNW TIPTOP
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative Deep atmospheric moisture was observed pooling ahead of an approaching cold front, although downslope westerly wind flow worked to inhibit convective development, resulting in only widely scattered showers and thunderstorms. Atmospheric winds aloft were light, resulting in slow storm motion.
Event Narrative A deputy sheriff observed six to eight inches of water associated with heavy rain flowing over Wittens Mill Road near Dolphin Lane. The high water washed out a nearby driveway.

Event Winter Weather
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2013-12-08 10:00 EST-5
End Date 2013-12-10 09:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A classic eastern U.S. cold air wedge set up began to evolve from December 7th into

December 8th as a large 1038mb Canadian surface high, anchored across eastern Pennsylvania and eastern New York wedged southwestward along the east side of the Appalachians down through Virginia into Georgia. Meanwhile, a cold front was stalled along the southeast U.S. coast. In the upper-levels of the atmosphere a deep western U.S. trough was slowly shifting eastward into the central U.S. Surface low pressure was tracking along the stalled southeast U.S. frontal boundary. This feature combined with the slowly eastward tracking upper-level trough provided for the development of widespread overrunning precipitation into the cold air mass where temperatures hovered in the upper 20s and lower 30s. Given that a layer of warmer air with temperatures above freezing was present just 3000 to 4000 feet above the surface, precipitation fell largely in the cold air at the surface as a wintry mix of freezing rain and sleet, with some snow in the northern portions and higher elevations of the Blacksburg County Warning Area (CWA). This was a near perfect cold air damming/wedge pattern for the mid-Atlantic region and as such proved to be so in terms of winter weather. Freezing rain with ice accumulations ranging from 1/4 to 1/2 inch was widespread across the Virginia Piedmont, Southside Virginia, the Roanoke Valley, the New River Valley, and the Alleghany Highlands. Sleet accumulations of 1/2 to 1 inch were also reported from the higher elevations of the New River Valley and northward in the Alleghany Highlands and Southern Shenandoah Valley. Warm temperatures in the days leading up to this event prevented widespread travel problems. However, ice accumulations on trees and power lines were significant. While between 50 and 100 residents in nearly all of the Virginia counties within the Blacksburg CWA were left without power for some duration, the most widespread power outages were encountered across the Piedmont and Southside areas where over 2000 customers were left without power in Pittsylvania county and nearly 2000 customers in both Campbell and Henry counties of southern Virginia.
Here are some of the snow, sleet, and freezing rain accumulations reported across southwest. south central, and west central Virginia as of the morning of December 9, 2013.
Alleghany (4E Convington) - 1.20 inch sleet, 0.20 inch ice, (1W Natural Well) - 0.25 inch ice, Amherst (2W Elon) - 0.25 inch, (2WSW Willow) - 0.30 inch, Appomattox (2E Concord) - 0.30 inch, Bath county (1 NNW Millboro) - 0.50 inch ice, Bedford county (4NNW Forest) - 0.25 inch ice, (5NW Lynchburg Airport) - 0.25 inch ice, (Peaks of Otter Summit) - 0.13 inch ice, Bland county (Bastian) - 0.25 inch ice, Bottetourt county (Fincastle) - 0.25 inch ice, (Blue Ridge) - 0.25 inch ice, Buckingham (Buckingham) - 0.40 inch sleet/ice Buena Vista City - 0.25 inch ice, Campbell county (1W Altavista) - 0.10 inch sleet/0.25 inch ice, (1S Hat Creek) - 0.25 inch ice Covington City (2SSW) - 0.25 inch ice/trace sleet Danville City - 0.10 inch ice, Craig county (1 ESE Simmonsville) - 0.75 inch sleet/0.25 inch ice, (New Castle) - 0.25 inch ice, Franklin county (Callaway) - 0.25 inch ice, (Boones Mill) - 0.50 inch ice, Galax City - 0.25 inch ice, Giles county (Pearisburg) - 0.30 inch ice, Grayson county (2W Baywood) - 0.10 inch ice, Montgomery county (5NNE Blacksburg/Brush Mountain) - 0.50 inch sleet/0.1 inch ice, (Blacksburg) - 0.19 inch ice, Patrick county (10NE Stuart) - 0.30 inch ice, Pittsylvania county (Dry Fork) - 0.13 inch ice, Pulaski county (Pulaski) - 0.20 inch ice, Roanoke city - 0.30 inch ice, Roanoke county (Bent Mountain) - 0.25 inch ice, Rockbridge county (3NW Vesuvius) - 0.25 inch ice, Tazewell county (Falls Mills) - 0.10 inch ice, Wythe county (2NNW Grahams Forge) - 0.20 inch ice (Max Meadows) - 0.13 inch ice.
Event Narrative The public reported 0.10 inch of ice accumulation in the Falls Mills area.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-01-02 17:00 EST-5
End Date 2014-01-03 08:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A deep low pressure system affecting the Atlantic coast was followed by a strong arctic cold front passing across the region during the early morning hours of January 3rd, resulting in brief but heavy accumulating snow confined mainly to the west-facing slopes from southeast West Virginia through the mountains of North Carolina. Winds with the arctic surge topped 60 mph in a few places across the mountains and, when combined with snow, resulted in periods of localized blizzard-like conditions. Temperatures dropped into the teens and the positive single digits across the mountains, resulting flash-freezing of wet surfaces from rainfall on January 2nd. Wind chills across the mountains were exceptionally cold, dropping into the negative teens. Gradient winds began to relax by sunrise on the 3rd, allowing snow shower activity and blowing snow to diminish.
Event Narrative Reports ranging from two to five inches of snow accumulation were received from across Tazewell County. In addition, wind gusts as high as 47 mph were observed, resulting in blowing snow that significantly reduced visibilities, as well as dangerously low wind chill temperatures.

Event **Cold/Wind Chill**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **AWOS**
NCEI Data Source **CSV**
Begin Date **2014-01-07 00:00 EST-5**
End Date **2014-01-07 12:00 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **A surge of arctic air arrived into the mid-Atlantic during the early morning hours of January 6th. Temperatures continued to fall over the next 24 hours, eventually bottoming out below zero nearly everywhere west of the Blue Ridge. Winds remained gusty through that 24 hour period as well due to a tightened pressure gradient as high pressure built into the region. The result was dangerously low wind chill temperatures not see in the region in many years.**
Event Narrative **Wind chill temperatures were observed in the -20F to -32F range at several locations throughout the county during the early morning hours of January 7th, 2014.**

Event **High Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **AWOS**
NCEI Data Source **CSV**
Begin Date **2014-01-25 19:55 EST-5**
End Date **2014-01-25 19:55 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **A large dome of Canadian high pressure built into the mid-Atlantic region behind an Alberta Clipper cold front. The very tight pressure gradient between the two systems resulted in very gusty northwest winds across the mountains, as well as a period of upslope snow showers that were heavy at times.**
Event Narrative

Event **Heavy Snow**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Trained Spotter**
NCEI Data Source **CSV**
Begin Date **2014-02-12 13:25 EST-5**
End Date **2014-02-13 15:55 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage **0.00K**
Episode Narrative **Cold high pressure was in place across the region on Tuesday, February 11, 2014. An area of low pressure progressed northward from the Gulf of Mexico the 11th into the 12th of February and transported a generous amount of moisture into and across the cold air over the area allowing the precipitation to fall as moderate to heavy snow. During Tuesday night into Wednesday the low passed over the region and brought some air just slightly above freezing into the lower portions of the atmosphere. This allowed for the snow to transition into a period of freezing rain and/or sleet over parts of the western Virginia piedmont. However, during the day on Thursday, February 13, 2014, the low pressure progressed northeast of the region, and sub-freezing air in the lower parts of the**

atmosphere returned and allowed for snow to be falling across the area until it ended in the mid to late afternoon. Before its conclusion, there was a time where a clearly defined band of snow stalled, and pivoted around a central location in southwest Virginia. This allowed for the axis of heaviest snowfall to be centered along parts of the New River and upper Roanoke valleys.
Snowfall totals averaged 6 to 10 inches along and east of a Martinsville to Lynchburg line, 10 to 14 inches across the Mountain Empire part of southwest Virginia, 12 to 16 inches just east of the crest of the Blue Ridge and north into the southern Shenandoah valley, with 16 to 26 inches in an area between Covington Virginia south into the Blacksburg to Roanoke region and farther south to near Galax. The highest end of this range was centered over Floyd County.
Sleet amounts were generally less than an inch between Martinsville and Danville. Freezing rain occurred mainly along and east of a line from Martinsville to Buckingham. Amounts ranged from around one tenth of an inch to one quarter of an inch.
Event Narrative Snowfall amounts ranged from around 9 inches in the western part of the county to 17 inches in the east.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-03-12 13:05 EST-5
End Date 2014-03-12 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative An intensifying center of low pressure passed north of the area and the trailing cold front was accompanied by very strong winds behind it as very cold air surged southward along with a large pressure rises.
Event Narrative A telephone pole and power lines in Cedar Bluff were blown down and shingles removed from a home in Jewell Ridge.

Event Winter Weather
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Newspaper
NCEI Data Source CSV
Begin Date 2014-03-13 00:00 EST-5
End Date 2014-03-13 11:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Northwest winds behind a departing cold front, generated upslope snow showers in portions of southwest VA. Snowfall totals in Tazewell county averaged around one inch, and caused several minor accidents due to snow covered roads.
Event Narrative Several minor accidents occurred in Tazewell county due to light snow that fell over the area, covering roads. Snowfall totals in Tazewell county averaged around one inch.

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-06-10 18:36 EST-5

Begin Location 1E RICHLANDS
Begin Lat/Lon 37.1/-81.8
End Date 2014-06-10 18:36 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative Unstable air was situated over the region south of a warm front and east of an approaching cold front. Showers and storms developed during the late afternoon and continued into the nighttime. Some storms increased to severe levels and produced damaging winds and large hail.
Event Narrative

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-06-10 18:40 EST-5
Begin Location 2N MAXWELL
Begin Lat/Lon 37.1478/-81.5982
End Date 2014-06-10 18:40 EST-5
End Location 2N MAXWELL
End Lat/Lon 37.1478/-81.5982
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.20K
Crop Damage
Episode Narrative Unstable air was situated over the region south of a warm front and east of an approaching cold front. Showers and storms developed during the late afternoon and continued into the nighttime. Some storms increased to severe levels and produced damaging winds and large hail.
Event Narrative Thunderstorm winds blew a large limb down that blocked both lanes of Dryfork Road. Damage values are estimated.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2014-06-10 18:40 EST-5
Begin Location 1WNW CEDAR BLUFF
Begin Lat/Lon 37.0899/-81.7889
End Date 2014-06-10 18:40 EST-5
End Location 1WNW CEDAR BLUFF
End Lat/Lon 37.0899/-81.7889
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage
Episode Narrative Unstable air was situated over the region south of a warm front and east of an approaching cold front. Showers and storms developed during the late afternoon and continued into the nighttime. Some storms increased to severe levels and produced damaging winds and large hail.
Event Narrative Thunderstorm winds blew a tree down on McGuire Lane. Damage values are estimated.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2014-10-14 21:45 EST-5
End Date 2014-10-14 23:15 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage
Episode Narrative As a cold front approached the region, surface winds increased significantly in advance of the front on Tuesday the 14th, and then continued very gusty behind the front into the early morning hours of Wednesday the 15th. A large number of trees were blown down in association with these winds. Showers and storms developed in advance of the front and also occurred coincident to the passage of the front. Trees were blown down in association with a few of the storms increasing to severe levels.
Event Narrative High winds blew two trees down in Tazewell County. The one tree was blown down across McQuire Valley Road. The other tree was blown down across Highway 19 near Kents Ridge Road. Damage values are estimated.

Event Winter Weather
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2014-11-01 00:00 EST-5
End Date 2014-11-01 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A very high amplitude upper atmospheric pattern featured equally deep troughs in the western and eastern U.S. Within the eastern U.S. trough, was a vigorous Alberta clipper that intensified immensely as it plunged into the southeast states into the base of the upper trough. Meanwhile...a large nearly 1040mb Canadian High was plunging into the central and eastern U.S. on the back side of the developing storm system in the southeast states. The combination of these features brought an early season snowfall principally to the Appalachian mountains of eastern Tennessee, far southwest Virginia, and northwest North Carolina. Light snow also fell in the mountains of eastern West Virginia, but the storm system tracked too far south for any significant amounts in that region. Snowfall amounts were generally in the 1 to 3 inch range across this region...with some higher totals in the higher elevations of northwest North Carolina. Strong and gusty northwest winds accompanied the snow in these areas causing scattered power outages. A few locations recorded wind gusts in excess of 45 mph, meeting strong wind criteria. These included Hot Springs in Bath county with a wind gust of 46 mph at 8:35 am EST on 11/2/14, the AWOS at the Galax/Hillsville Airport on 11/2/14 at 12:35 am EST, and a weather station located four miles west of Dublin in Pulaski county which recorded a wind gust of 47 mph on 11/2/14 at 4:05 am EST. Several hundred residents of Tazewell county in far southwest Virginia were left without power for several hours from the comination of 30 to 40 mph wind gusts and the heavy, wet snow. Because of warm temperatures within the preceding days and the early season time of the event, roads and travel conditions were not significantly impacted.
Here are some of the snow reports from southwest Virginia as of the afternoon of November 1, 2014. These denote the high end of the event in these counties. Note, the event actually began during the afternoon of October 31st.
Bland (Ceres) - 1 inch, Carroll (6N Galax, Woodlawn) - 3 inches, City of Galax - 4 inches, Floyd (Floyd) - 3 inches, Giles (Mountain Lake) - 3 inches, Grayson (5NE Independence) - 4 inches, Patrick (Meadows of Dan) - 4 inches, Pulaski (2S Snowville) - 2 inches, Smyth (Marion) - 2 inches, Tazewell (Tazewell) - 4 inches, Wythe (Rural Retreat) - 2 inches.
Event Narrative The public reported four inches of snow in Tazewell, 2.5 inches of in Bluefield, and one inch of snow at Burkes Garden.

Event High Wind

Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2014-11-20 00:00 EST-5
End Date 2014-11-20 03:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 30.00K
Crop Damage 0.00K
Episode Narrative A northwest flow upper trough and associated strong cold front were approaching the region from the west. Strong southeast winds developed through the mountains of Smyth and Tazewell counties in Virginia into Mercer county in southeast West Virginia during the early morning hours. The winds were strong enough to blow over a communications tower near Tazewell.
Event Narrative The Tazewell County Emergency Management Director reported that winds had blown over a communications tower near Tazewell.

Event Strong Wind
Magnitude 41 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Mesonet
NCEI Data Source CSV
Begin Date 2014-11-24 12:30 EST-5
End Date 2014-11-24 15:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 20.00K
Crop Damage 0.00K
Episode Narrative A strong cold front was approaching from the Tennessee and Ohio Valleys during the day on the 24th, moving into southwest Virginia during the early to mid-afternoon. Very strong southerly gradient winds were observed in advance of the front, a common occurrence with these type of synoptic patterns across the mountains of southwest Virginia. Several wind gusts in the 35 to 47 mph range were observed by weather stations in Tazewell and Richlands, both in Tazewell county. These non-thunderstorm related wind gusts were responsible for blowing down at least seven trees across the county, including one tree that fell on and caused damage to three cars parked at the Cedar Bluff Post Office.
Event Narrative Wind gusts measured by a mesonet station in Tazewell and the AWOS at Richlands showed wind gusts of 40 and 47 mph, respectively in the 12:30 pm to 3:30 pm EST time frame. At least seven trees were down across the county as a result of these strong winds. One tree fell on three parked cars at the Cedar Bluff Post Office around 2:35 pm EST causing damage to the vehicles.

Event Winter Weather
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2014-11-26 04:00 EST-5
End Date 2014-11-26 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A deep upper trough, developing through the central U.S. and swinging into the southeast states the Tuesday before Thanksgiving induced an area of low pressure along the eastern Gulf Coastal region. As the upper trough shifted into the eastern U.S., the surface low underwent explosive development as it moved northward

along the southeast and Mid-Atlantic coastal region. The deepening surface low pulled cold air and moisture into the region bringing a period of snow to areas west of the Blue Ridge on one of the busiest travel days of the year. Snowfall amounts were generally in the one to three inch range, but several locations saw snowfall in the three to four inch range across southwest Virginia, northwest North Carolina, and southeast West Virginia. The heaviest snowfall within southwest Virginia was at Mount Rogers in Grayson county where eight inches of snow was observed. The heavy wet snow resulted and combined gusty winds resulted in power outages for several thousands residents of southwest Virginia counties.
Here are some of the snow reports from southwest Virginia as of mid-morning on the day before Thanksgiving, namely November 26, 2014. The amounts below represent the maximum amounts reported from these counties.
Alleghany (4E Covington) - 3 inches, Bath (Warm Springs) - 4 inches, Bedford (peaks of Otter) - 4 inches, Bland (5N Bland) - 3 inches, Botetourt (Fincastle) - 1.5 inch, Carroll (Hebron) - 4.9 inches, Craig (2W Simmonsville) - 6.5 inches, Floyd (Check) - 4.5 inches, Giles (Mountain Lake) - 5 inches, Grayson (Mount Rogers) - 8 inches, Montgomery (2SSW Christiansburg) - 5.8 inches, Patrick (Meadows of Dan) - 3.8 inches, Pulaski (2S Snowville) - 6.1 inches, Roanoke (3ESE Cave Spring) - 2.5 inches, Rockbridge (Raphine) - 4.0 inches, Smyth (Sugar Grove) - 3.5 inches, Tazewell (Burkes Garden) - 1.6 inch, Wythe (Rural Retreat) - 3.0 inches.
Event Narrative The Burkes Garden CO-OP observer reported 1.6 inches of snow, while the public observed 0.5 inch and 1.0 inch of snow at Maiden Spring and Richlands, respectively.

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-01-04 07:45 EST-5
End Date 2015-01-04 08:05 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.00K
Crop Damage
Episode Narrative A strong low level jet from the southwest increased in advance of an approaching cold front. Some of these stronger winds aloft were able to mix to the surface and down some trees. Near the community of Claypool Hill, one tree was blown down on College Estates Road. A few trees were blown down within the community of Bluefield.
Event Narrative A few trees were blown down in the community of Bluefield. On College Estates Road in Claypool Hill, one tree was toppled by the wind. Damage values are estimated.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2015-02-16 09:00 EST-5
End Date 2015-02-17 12:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Immediately on the heels of the intense Arctic outbreak that spread into the region on the 14th and 15th came the most significant snow storm to affect the region since February 12th and 13th of 2014. The snow storm was the result of a strong upper-level disturbance tracking from the central U.S. into the eastern U.S. on top of the bitterly cold Arctic air mass. A surface low pressure area tracked across the southeast states to off the North Carolina coast, a fairly typical scenario for bigger snowfall events in our area. Temperatures had little to no time to recover at all from the bitterly cold temperatures of the 15th. As snow spread into the region during the late morning and early afternoon hours of the 16th, temperatures were only in the upper teens to lower 20s across the region and fell back into the 10 to 20 degree range across much of the region during the heavier snow. Snowfall amounts were significant in many areas, ranging from 3 to 4 inches across the Piedmont, where some sleet mixed in during the later

part of the event, to 8 to 11 inches across the New River Valley, Greenbrier Valley, and Tazewell county in far southwest Virginia. In addition to the snow storm, the extended period of extreme cold preceding and following this event caused many ponds to ice over. A 51-year old female died when she fell into an ice covered pond in Pittsylvania County while trying to feed ducks. Her husband was also rescued from the frozen waters, but without injury. In Blacksburg, two children had to be rescued from an ice-covered pond. There were also a vehicle-related death during the snow storm on Interstate 81 in Wythe county where a vehicle ran off the right side of the road into the median and overturned, killing the driver. There were 53 vehicle accidents and 121 disabled vehicles during the height of the snow storm.
Here are the snowfall amounts from the southwest and south central Virginia counties within our forecast area: Alleghany County - 8.5 inches 4E of Covington to 6.5 inches at Covington, Amherst County - 7.0 inches 2W of Elon and 3SW of Lowesville, Appomattox County - 9.0 inches at Stonewall to 7.0 inches 2NW of Oakville, Bath County - 8.0 inches at Mountain Grove to 5.0 inches at Williamsville, Bedford County - 9.5 inches at Forest to 7.0 inches just southeast of Big Island, Bland County - 7.0 inches 3SSE or Suiter and Bland to 5.2 inches 3SW of Long Spur, Botetourt County - 10.0 inches at Laymantown to 8.0 inches just east-northeast of Cloverdale, Buckingham County - 8.0 inches of snow at Cumberland, Campbell County - 9.0 inches 4NNE of Rustburg to 7.2 inches at the Lynchburg Airport, Carroll County - 6.0 inches at Hillsville to 4.0 inches 2NNE of Galax/Hillsville Airport, Charlotte County - 6.2 inches at Charlotte Court House to 4.5 inches at Saxe, Craig County - 7.0 inches of snow in New Castle to 6.0 inches of snow 4W of New Castle, Floyd County - 6.0 inches 1SE of Simpsons to 3.0 inches 2SE of Willis, Franklin County - 8.0 inches 4SSW of Moneta to 5.0 inches at Rocky Mount, Giles County - 9.7 inches 2SE of Mountain Lake (elevation 4000 feet) to 7.5 inches 2E of Pearisburg, Grayson County - 6.0 inches 5NW of Baywood to 3.0 inches 3W of Baywood, Halifax County - 5.9 inches at South Boston to 3.0 inches at Clover, Henry County - 4.0 inches at Mountain Valley, Montgomery County - 9.5 inches 5NNE of Blacksburg (Brush Mountain) and 1E of Shawsville to 6.0 inches 3E of Pilot, Patrick County - 5.5 inches 4ESE of Buffalo Ridge, Pittsylvania County - 5.0 inches at Pittsville to 2.0 inches at Danville, Pulaski County - 6.0 inches from Draper to Snowville, Rockbridge County - 6.4 inches 3SW of Rockbridge Baths to 8.0 inches at Buena Vista, Roanoke County - 9.0 inches 4NW Roanoke Airport and Salem to 7.5 inches 1ESE of Roanoke Airport, Smyth County - 7.0 inches at Chilhowie to 4.8 inches 1N of Marion, Tazewell County - 11.0 inches at Burkes Garden and Richlands Wythe County - 5.2 inches 1WNW Gunton Park to 3.0 inches 2WSW Wytheville.
Event Narrative The COOP observers at Burkes Garden and Richlands both measured 11.0 inches of snow. The was the maximum amount of snow reported from this event in the Virginia counties within the Blacksburg National Weather Service forecast area.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Mesonet
NCEI Data Source CSV
Begin Date 2015-02-19 05:00 EST-5
End Date 2015-02-19 09:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative The second major Arctic blast to affect the region within the same 7-day period surged through the region on the 18th sending temperatures to their lowest levels in over a year and by the morning of the 20th setting record low temperatures. Maximum temperatures on the 19th failed to rise above 20F across the Piedmont and failed to even reach 10F across the western mountains. All of the climate stations within the Blacksburg National Weather Service Forecast Office County Warning Area (CWA) tied record low maximum temperatures on the 18th and all but Bluefield did the same on the 20th. All of the climate stations set record low temperatures the morning of February 20th, with Lynchburg recording a new all time record low temperature of 11F early in the morning on the 20th. The first morning after the Arctic frontal passage brought bitterly cold temperatures and gusty northwest winds leading to dangerously low wind chills. The record cold resulted in at least one instance of frozen water pipes at an office building in Lynchburg which suffered extensive damage as a result. Undoubtedly, there are countless other such events for which documentation was not received. Below are the highlights of the dangerously low -20F or lower wind chills from the Virginia counties within the Blacksburg National Weather Service Forecast area as well as the plethora of record low and record low maximum temperatures set as a result of this Arctic outbreak:
Wind Chills: Bath County - the Hot Springs (Ingalls Field) AWOS (KHSP) recorded a wind chill of -32F at 715 am EST on the 19th, Bland County - a mesonet station in Bland recorded a wind chill of -20F at 725 am EST on the 19th, Carroll County - the Galax/Hillsville Airport (KHLX) recorded a wind chill of -25F at 815 am EST on the 19th while a mesonet station 2N of Fancy Gap recorded a wind chill of -21F at 829 am EST on the 19th,

Grayson County - A wind chill of -24F was recorded 2NNW of Elk Creek by a mesonet station at 746 am EST on the 19th, Montgomery County - wind chill readings of -23F to -25F were recorded 4E of Childress and 4NE of Blacksburg at 835 am EST and 747 am EST via mesonet stations on the 19th, respectively. A wind chill of -22F was recorded by a mesonet station at Radford. Pulaski County - wind chill readings of -25F 2SW of Graysontown and -20F at the Pulaski County/Dublin Airport, Roanoke County - a wind chill reading of -23F was recorded 3NNW of Bent Mountain by a mesonet station at 841 am EST on the 19th, Smyth County - a wind chill reading of -24F was recorded at the Marion/Wytheville Mt. Empire Airport (KMKJ) at 835 am EST on the 19th, Tazewell County - wind chill readings of -24F were recorded by mesonet stations 5SW of Claypool Hill, 2ENE of Tazewell, and 2S of Richlands at 759 am EST, 840 am EST, and 735 am EST on the 19th, respectively, Wythe - a wind chill reading of -22F was recorded 2E of the Marion/Wytheville Airport.
Record Low Maximum Temperatures on the 19th: Roanoke - maximum temperature of 13F tied for 7th coldest on record and coldest maximum temperature since 12/22/1989. Coldest on record is 11F set on 12/22/1989, Blacksburg - maximum temperature of 7F tied for 5th coldest on record and coldest maximum temperature observed since 1/10/1970. Coldest on record is 2F set on 1/28/1996. Lynchburg - maximum temperature of 15F tied for 15th coldest on record and coldest maximum temperature since 1/10/1984. Coldest on record is 9F set on 2/13/1899. Danville - maximum temperature of 20F tied for the 3rd coldest on record and coldest maximum temperature since 1/15/1994. Coldest on record is 16F set on 2/17/1958.
Record Low Maximum Temperatures on the 20th: Roanoke - maximum of 22F broke previous record of 26F set in 1947, Blacksburg -maximum of 21F tied previous record of 21F set in 1958, Lynchburg - maximum of 18F broke previous record of 23F set in 1947, Danville - maximum of 24F broke previous record of 35F set in 1972.
Record Low Temperatures on the 20th: Roanoke - minimum of 0F broke previous record of 9F set in 1979, Blacksburg - minimum temperature of -5F broke previous record of 2F set in 1972, Lynchburg - minimum temperature of -11F broke previous record of 7F set in 1896. Note, this is also the all time minimum temperature for Lynchburg, breaking the previous record of -10F set on 2/5/1996 and 1/21/1985. Danville - minimum temperature of 3F broke previous record of 10F set in 1979.
Event Narrative Mesonet stations recorded wind chill readings of -24F 5SW of Claypool Hill, -24F 2ENE of Tazewell, and -23F 2S Richlands at 759 am EST, 840 am EST, and 735 am EST, respectively.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2015-02-21 08:00 EST-5
End Date 2015-02-22 06:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Right on the heels of the second surge of bitterly, record cold air to affect the forecast area within the same week and only five days since the previous significant snow storm, yet another significant winter storm impacted the forecast area. This storm was result of complex series of low pressure areas tracking along a stalled front across the southeast states and an upper-trough embedded within a very deep and persistent long-wave trough across the eastern U.S. Snow began to fall during the late morning and early afternoon spreading northward during the late afternoon and evening. Unlike the President's Day snow storm, this storm brought significantly greater two foot amounts to the northern portions of the forecast area, especially along the Interstate 64 corridor, while markedly less snow fell in the southern parts of the forecast area. The vast majority of winter storm-criteria snowfall (4 inches east to 5 inches west/6 hours) fell north of U.S. 460 with this event. Very little snowfall fell south of U.S. 460 and especially across the Virginia and North Carolina Piedmont. Snowfall amounts ranged from less than inch across most counties near the North Carolina border and east of Interstate 77 to two feet of snow across northern and western Greenbrier county West Virginia. However, at the end of this event as warm air aloft spread into the region, precipitation changed to freezing rain bringing ice accumulations of 1/10 to 1/4 inch to a number of counties east of Interstate 81.
The heavy snow across the northern parts of the forecast area resulted in two avalanches, a rare event in Virginia. One occurred on Virginia Route 623 in Tazewell county near Burkes Garden and the other was on U.S. 220 in Alleghany county near Iron Gate. In addition, there were over 100 traffic accidents and disabled vehicles across Virginia alone.
The following are snow and ice totals reported from southwest and south central Virginia counties within the Blacksburg National Weather Service Forecast area:
Snowfall: Alleghany County - 11.0 inches 4E of Covington to 8.0 inches in Alleghany, Amherst County - 11.0 inches 2SW Pera to 6.0 inches at Elon, Appomattox County - 3.0 inches at Appomattox, Bath County - 15 inches at Warm

Springs to 13 inches at Bath Alum, Bedford County - 9.5 inches at Big Island to 4.0 inches 5WSW of Bedford, Bland County - 7.0 inches at Ceres to 6.0 inches at Bland, Botetourt County - 12.0 inches at Fincastle to 9.0 inches at Buchanan, Buckingham County - 4.0 inches 1NW of Gold Hill to 1.8 inches 7N of Dillwyn, Campbell County - 5.0 inches City of Lynchburg, 3.0 inches at Concord and at the Lynchburg Airport to 2.0 inches at Rustburg, Carroll County - 1.5 inches 2SSE of Byllesby, Craig County - 18.0 inches at New Castle, Floyd County - 1.3 inches at Check, Franklin County - 3.5 inches at Rocky Mount to 2.3 inches at Callaway, Giles County - 8.0 inches 2SE Mountain Lake to 6.1 inches at Pearisburg, Grayson County - 1.5 inches 3SSW of Elk Creek, Montgomery County - 9.0 inches 5NNE of Blacksburg, 7.5 inches Blacksburg, 2.1 inches Christiansburg, to < 1.0 inch at Pilot, Patrick County - 1.0 inch 2W Critz, Pulaski County - 10.5 inches at Pulaski to 2.8 inches at Draper, Roanoke County - 11.5 inches at Catawba, 8.8 inches at Roanoke, 7.0 inches at Salem, to 3.0 inches 3NNW Boones Mill, Rockbridge County - 16.0 inches 3NW Rockbridge Baths and Zack 15.5 inches at Lexington, to 12.0 inches at Buena Vista, Smyth County - 4.0 inches at Chilhowie to 3.5 inches 2N Marion, Tazewell County - 9.0 inches at Tannersville to 7.0 inches at North Tazewell, Wythe County - 2.3 inches in Wytheville.
Ice: Alleghany County - 0.10 inch 4E of Covington, Bedford County - 0.25 inch 5WSW of Bedford to 0.10 inch 5NNW of Forest, Buckingham County - 0.10 inch 7N Dillwyn and in Buckingham, Campbell County - 0.30 inch at Altavista to 0.13 inch 1SE of Timberlake, Floyd County - 0.10 inch at Floyd, Franklin County - 0.25 inch at Boones Mill to 0.10 inch 3ESE of Roanoke Mountain, Henry County - 0.10 inch 6W of Bassett, Pittsylvania County - 0.10 inch at Pittsville, Pulaski County - 0.10 inch 2S Snowville and in Pulaski, Roanoke - 0.25 inch 3NNW of Boones Mill to 0.20 inch in Salem, Smyth County - 0.10 inch at Chilhowie, Tazewell County - 0.10 inch at North Tazewell.
Event Narrative A spotter measured 9.0 inches of snow in Tannersville. The public measured 7.0 inches of snow in North Tazewell along with 0.10 inch of ice. Elsewhere across the county, amounts were generally less than 7.0 inches.

Event Avalanche
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2015-02-21 15:00 EST-5
End Date 2015-02-21 15:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Right on the heels of the second surge of bitterly, record cold air to affect the forecast area within the same week and only five days since the previous significant snow storm, yet another significant winter storm impacted the forecast area. This storm was result of complex series of low pressure areas tracking along a stalled front across the southeast states and an upper-trough embedded within a very deep and persistent long-wave trough across the eastern U.S. Snow began to fall during the late morning and early afternoon spreading northward during the late afternoon and evening. Unlike the President's Day snow storm, this storm brought significantly greater two foot amounts to the northern portions of the forecast area, especially along the Interstate 64 corridor, while markedly less snow fell in the southern parts of the forecast area. The vast majority of winter storm-criteria snowfall (4 inches east to 5 inches west/6 hours) fell north of U.S. 460 with this event. Very little snowfall fell south of U.S. 460 and especially across the Virginia and North Carolina Piedmont. Snowfall amounts ranged from less than inch across most counties near the North Carolina border and east of Interstate 77 to two feet of snow across northern and western Greenbrier county West Virginia. However, at the end of this event as warm air aloft spread into the region, precipitation changed to freezing rain bringing ice accumulations of 1/10 to 1/4 inch to a number of counties east of Interstate 81.
The heavy snow across the northern parts of the forecast area resulted in two avalanches, a rare event in Virginia. One occurred on Virginia Route 623 in Tazewell county near Burkes Garden and the other was on U.S. 220 in Alleghany county near Iron Gate. In addition, there were over 100 traffic accidents and disabled vehicles across Virginia alone.
The following are snow and ice totals reported from southwest and south central Virginia counties within the Blacksburg National Weather Service Forecast area:
Snowfall: Alleghany County - 11.0 inches 4E of Covington to 8.0 inches in Alleghany, Amherst County - 11.0 inches 2SW Pera to 6.0 inches at Elon, Appomattox County - 3.0 inches at Appomattox, Bath County - 15 inches at Warm Springs to 13 inches at Bath Alum, Bedford County - 9.5 inches at Big Island to 4.0 inches 5WSW of Bedford, Bland County - 7.0 inches at Ceres to 6.0 inches at Bland, Botetourt County - 12.0 inches at Fincastle to 9.0 inches at Buchanan, Buckingham County - 4.0 inches 1NW of Gold Hill to 1.8 inches 7N of Dillwyn, Campbell County - 5.0 inches City of Lynchburg, 3.0 inches at Concord and at the Lynchburg Airport to 2.0 inches at Rustburg, Carroll County - 1.5 inches 2SSE of Byllesby, Craig County - 18.0 inches at New Castle, Floyd County - 1.3 inches at Check, Franklin County - 3.5 inches at Rocky Mount to 2.3 inches at Callaway, Giles County - 8.0 inches 2SE Mountain Lake

to 6.1 inches at Pearisburg, Grayson County - 1.5 inches 3SSW of Elk Creek, Montgomery County - 9.0 inches 5NNE of Blacksburg, 7.5 inches Blacksburg, 2.1 inches Christiansburg, to < 1.0 inch at Pilot, Patrick County - 1.0 inch 2W Critz, Pulaski County - 10.5 inches at Pulaski to 2.8 inches at Draper, Roanoke County - 11.5 inches at Catawba, 8.8 inches at Roanoke, 7.0 inches at Salem, to 3.0 inches 3NNW Boones Mill, Rockbridge County - 16.0 inches 3NW Rockbridge Baths and Zack 15.5 inches at Lexington, to 12.0 inches at Buena Vista, Smyth County - 4.0 inches at Chilhowie to 3.5 inches 2N Marion, Tazewell County - 9.0 inches at Tannersville to 7.0 inches at North Tazewell, Wythe County - 2.3 inches in Wytheville.
Ice: Alleghany County - 0.10 inch 4E of Covington, Bedford County - 0.25 inch 5WSW of Bedford to 0.10 inch 5NNW of Forest, Buckingham County - 0.10 inch 7N Dillwyn and in Buckingham, Campbell County - 0.30 inch at Altavista to 0.13 inch 1SE of Timberlake, Floyd County - 0.10 inch at Floyd, Franklin County - 0.25 inch at Boones Mill to 0.10 inch 3ESE of Roanoke Mountain, Henry County - 0.10 inch 6W of Bassett, Pittsylvania County - 0.10 inch at Pittsville, Pulaski County - 0.10 inch 2S Snowville and in Pulaski, Roanoke - 0.25 inch 3NNW of Boones Mill to 0.20 inch in Salem, Smyth County - 0.10 inch at Chilhowie, Tazewell County - 0.10 inch at North Tazewell.
Event Narrative WVVA Television reported that there was an avalanche on Virginia route 623 near Burkes Garden. The road was closed for several hours until the snow could be cleared from the road.

Event Winter Weather
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2015-02-25 23:00 EST-5
End Date 2015-02-26 05:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A low pressure area took a fairly classic path from the northeast Gulf to off the North Carolina coast between the afternoon of the 25th and the morning of the 26th. However, the track of the low was a little further south and east than needed to bring optimal snowfall to the region. Snowfall amounts were heaviest across the southern counties of the forecast area and especially across the North Carolina counties. Snowfall amounts ranged from 4.0 to 8.0 inches across northwest and north central North Carolina, to 3.0 to 6.0 inches across southwest Virginia and Southside Virginia, mostly east of the Blue Ridge, to 2.0 to 3.0 inches further north across southeast West Virginia and toward the Shenandoah Valley of Virginia. The heaviest snow was nearly all south of U.S. 460 across the forecast area.
Here are the snowfall amounts reported from the Virginia counties within the Blacksburg, Virginia National Weather Service Forecast Office area:
Amherst County - 4.0 to 5.0 inches across the county, Bedford County - 4.0 to 6.0 inches across the county, Bland County - 3.0 to 4.0 inches across the county, Botetourt County - 3.0 to 4.0 inches across the county, Campbell County - 3.0 to 6.0 inches across the county, Charlotte County - 5.0 to 6.0 inches across the county, Floyd County - 5.0 inches across much of the county, Giles County - 2.0 to 3.0 inches across the county, Grayson County - 5.0 to 6.0 inches across the county, Montgomery County - 3.0 to 4.0 inches across the county, Patrick County - 5.0 to 6.0 inches across the county, Roanoke County - 3.0 to 4.0 inches across the county, Rockbridge County - 2.0 to 3.0 inches across the county, Smyth County - 4.0 to 5.0 inches across the county, Tazewell County - 3.0 to 4.0 inches across the county, Wythe County - 4.0 inches across much of the county.
Event Narrative The Tazewell County Sheriff's Office reported 4.0 inches of snow in Tazewell and the public measured 4.0 inches of snow in Richlands. Elsewhere across the county, snowfall amounts were mostly in the 2.5 to 3.0 range as reported by spotters.

Event Flood
-- Flood Cause Heavy Rain / Snow Melt
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-03-04 08:00 EST-5
Begin Location 0WSW RED ASH

Begin Lat/Lon 37.1176/-81.8852
End Date 2015-03-05 22:00 EST-5
End Location 1W AMONATE
End Lat/Lon 37.1773/-81.6765
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative A wet period began early on the 4th as a complex series of disturbances lifted northeast through the Ohio Valley pushing a slow-moving cold front across the area. Rainfall ending 0700 EST on March 4th was confined to the northwestern mountains with amounts to that time from 0.25 to 0.75 inches. Stream gages across parts of the western New and Greenbrier basins were rising rapidly during the overnight and early morning hours of March 4th. The wet soils and rapid snowmelt were strong contributors to the rapid runoff. Snow water equivalents per the National Operational Hydrologic Remote Sensing Center (NOHRSC) in parts of these river basins ranged from around 1��� to as much as 4��� in the higher terrain at the outset of the flooding. The rain and warmer temperatures caused rapid snowmelt the entire day on the 4th along with continued rainfall and there were numerous reports of flooding.
Event Narrative Numerous roads were closed due to flooding across the county. A church and several properties were flooded in the Raven area causing significant damage. The Clinch River at Richlands in western Tazewell County crested above the Moderate Flood Stage (12 feet) at 12.29 feet early on the 5th which was the highest stage observed since March, 1998.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-05-16 18:30 EST-5
Begin Location 1ENE HORSEPEN
End Date 2015-05-16 21:40 EST-5
End Location 2NNE MUD FORK
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A thunderstorm over northeast Tazewell County produced 2 or more inches of rain a few hours and caused some pockets of flash flooding.
Event Narrative Water was reported to be flowing across several roads in the Abbs Valley Area including portions of Abbs Valley Road, Route 161 and Bo Street rendering them impassable and closed in those locations.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-05-16 19:00 EST-5
Begin Location 0N YARDS
End Date 2015-05-16 21:00 EST-5
End Location 0N YARDS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A thunderstorm over northeast Tazewell County produced 2 or more inches of rain a few hours and caused some pockets of flash flooding.

Event Narrative Heavy rains caused Big Branch Creek to climb out of its banks and flood Big Branch Road.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2015-06-08 17:49 EST-5
Begin Location 0SW BAILEY
Begin Lat/Lon 37.2183/-81.3823
End Date 2015-06-08 17:49 EST-5
End Location 0SW BAILEY
End Lat/Lon 37.2183/-81.3823
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative A few thunderstorms became severe during the afternoon and evening of June 8th, triggered by the combination of instability associated with an upper level trough digging across the eastern United States, pushing a cold front southward toward the central Appalachians. Surface-based CAPE (Convective Available Potential Energy) values ahead of the approaching cold front rose to around 2000 J/Kg with afternoon heating.
Event Narrative A tree was blown down across Baily Switch Road.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2015-06-21 16:00 EST-5
Begin Location 2N TIPTOP
Begin Lat/Lon 37.2295/-81.4297
End Date 2015-06-21 16:00 EST-5
End Location 2N TIPTOP
End Lat/Lon 37.2295/-81.4297
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Upper level ridging became established across the central Plains, with upper level troughing observed across the Great Lakes region, resulting in west northwesterly wind flow aloft for the central Appalachians. Upper level disturbances embedded within the flow passed across the forecast area, triggering a few strong to severe thunderstorms. CAPE (Convective Available Potential Energy) values were observed exceeding 2000 J/Kg during the afternoon and early evening.
Event Narrative

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2015-06-21 16:10 EST-5
Begin Location 1NE POCAHONTAS

Begin Lat/Lon 37.3076/-81.3386
End Date 2015-06-21 16:10 EST-5
End Location 1NE POCAHONTAS
End Lat/Lon 37.3076/-81.3386
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative Upper level ridging became established across the central Plains, with upper level troughing observed across the Great Lakes region, resulting in west northwesterly wind flow aloft for the central Appalachians. Upper level disturbances embedded within the flow passed across the forecast area, triggering a few strong to severe thunderstorms. CAPE (Convective Available Potential Energy) values were observed exceeding 2000 J/Kg during the afternoon and early evening.
Event Narrative A tree was blown down in the community of Pocahontas.

Event Strong Wind
Magnitude 40 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2015-06-26 22:57 EST-5
End Date 2015-06-26 22:57 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.10K
Crop Damage 0.00K
Episode Narrative Upper level clouds from a thunderstorm complex arriving during the morning of June 26th cleared across the mountains of North Carolina into southern Virginia by early afternoon, allowing strong surface heating to take place. The heating provided instability for the remnants of a strong thunderstorm complex arriving from eastern Tennessee and Kentucky to allow a few storms to pulse upward to severe levels.
Event Narrative Tree limbs less than an inch in diameter and a few roof shingles were blown down in the Richlands area during a thunderstorm. Dime-size hail was also observed.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-05 19:00 EST-5
Begin Location 0N POCAHONTAS
End Date 2015-07-05 23:00 EST-5
End Location 0ENE POCAHONTAS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.50M
Crop Damage 0.00K
Episode Narrative Heavy rainfall developed across portions of the southern Appalachian mountains as clearing ahead of a slow-moving surface low over the Cumberland Gap allowed instabilities to rise into the 2000 J/Kg range along with good upper divergence. Developing storms and cell mergers produced rainfall rates of 1.5���/hr with totals up to 3-4��� in isolated storms. A Flash Flood Warning was issued for Tazewell County at 737 PM EDT where radar had showed 1 to 2 inches of rain had fallen with more expected. Total rainfall amounts reached 2.5 to 3 inches in a 3-hour period ending around 02z (10 PM on the 5th) over parts of northeastern Tazewell County which produced substantial flash flooding and debris flows in several locations. The worst flooding occurred along Laurel Fork near the town of Pocahontas where 25 homes, 5 businesses and 2 mobile homes were damaged or destroyed.
Event Narrative Laurel Creek flooded about half of the town of Pocahontas. 25 homes, 5 businesses and 2 mobile

homes were damaged or destroyed. Total damage estimates reached $3.5 million, primarily due to a single business that was uninsured and destroyed. Multiple roads across northeast Tazewell County were reported to be closed due to flooding and mudslides as well.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2015-07-05 19:38 EST-5
Begin Location 1W YARDS
End Date 2015-07-05 21:00 EST-5
End Location 1W YARDS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Heavy rainfall developed across portions of the southern Appalachian mountains as clearing ahead of a slow-moving surface low over the Cumberland Gap allowed instabilities to rise into the 2000 J/Kg range along with good upper divergence. Developing storms and cell mergers produced rainfall rates of 1.5���/hr with totals up to 3-4��� in isolated storms. A Flash Flood Warning was issued for Tazewell County at 737 PM EDT where radar had showed 1 to 2 inches of rain had fallen with more expected. Total rainfall amounts reached 2.5 to 3 inches in a 3-hour period ending around 02z (10 PM on the 5th) over parts of northeastern Tazewell County which produced substantial flash flooding and debris flows in several locations. The worst flooding occurred along Laurel Fork near the town of Pocahontas where 25 homes, 5 businesses and 2 mobile homes were damaged or destroyed.
Event Narrative Big Branch Creek flooded its banks, crossing over Big Branch Road.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-05 20:00 EST-5
Begin Location 1NNE WITTENS MILLS
End Date 2015-07-05 23:00 EST-5
End Location 1E FIVE OAKS
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Heavy rainfall developed across portions of the southern Appalachian mountains as clearing ahead of a slow-moving surface low over the Cumberland Gap allowed instabilities to rise into the 2000 J/Kg range along with good upper divergence. Developing storms and cell mergers produced rainfall rates of 1.5���/hr with totals up to 3-4��� in isolated storms. A Flash Flood Warning was issued for Tazewell County at 737 PM EDT where radar had showed 1 to 2 inches of rain had fallen with more expected. Total rainfall amounts reached 2.5 to 3 inches in a 3-hour period ending around 02z (10 PM on the 5th) over parts of northeastern Tazewell County which produced substantial flash flooding and debris flows in several locations. The worst flooding occurred along Laurel Fork near the town of Pocahontas where 25 homes, 5 businesses and 2 mobile homes were damaged or destroyed.
Event Narrative Multiple roads and portions of Route 460 between Tazewell and Bluefield were closed due to flash flooding.

Event Flash Flood
-- Flood Cause Heavy Rain
State VIRGINIA

County/Area TAZEWELL
WFO RNK
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2015-07-05 20:00 EST-5
Begin Location 2NNE MUD FORK
End Date 2015-07-05 23:00 EST-5
End Location 2NNE MUD FORK
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 200.00K
Crop Damage 0.00K
Episode Narrative Heavy rainfall developed across portions of the southern Appalachian mountains as clearing ahead of a slow-moving surface low over the Cumberland Gap allowed instabilities to rise into the 2000 J/Kg range along with good upper divergence. Developing storms and cell mergers produced rainfall rates of 1.5���/hr with totals up to 3-4��� in isolated storms. A Flash Flood Warning was issued for Tazewell County at 737 PM EDT where radar had showed 1 to 2 inches of rain had fallen with more expected. Total rainfall amounts reached 2.5 to 3 inches in a 3-hour period ending around 02z (10 PM on the 5th) over parts of northeastern Tazewell County which produced substantial flash flooding and debris flows in several locations. The worst flooding occurred along Laurel Fork near the town of Pocahontas where 25 homes, 5 businesses and 2 mobile homes were damaged or destroyed.
Event Narrative Five homes in Abbs Valley were flooded and considered a total loss.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2015-07-13 17:00 EST-5
Begin Location 4SSW PUCKETTS STORE
Begin Lat/Lon 36.97/-81.63
End Date 2015-07-13 17:00 EST-5
End Location 4SSW PUCKETTS STORE
End Lat/Lon 36.97/-81.63
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage
Episode Narrative A line of thunderstorms associated with a larger cluster of storms advanced southeast through the region. A large number of trees were downed across the area, and some storms produced large hail during the late afternoon and early evening. An isolated severe storm not associated with the thunderstorm complex generated quarter size hail much earlier in the day in Bedford.
Event Narrative Thunderstorm winds down several trees in the Tannersville area. Damage values are estimated.

Event Thunderstorm Wind
Magnitude 60 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2015-07-13 17:08 EST-5
Begin Location 2ENE HORSEPEN
Begin Lat/Lon 37.2417/-81.4968
End Date 2015-07-13 17:36 EST-5
End Location 6S MALDEN SPGS
End Lat/Lon 36.9415/-81.6781
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect **0/0**
Property Damage **20.00K**
Crop Damage
Episode Narrative **A line of thunderstorms associated with a larger cluster of storms advanced southeast through the region. A large number of trees were downed across the area, and some storms produced large hail during the late afternoon and early evening. An isolated severe storm not associated with the thunderstorm complex generated quarter size hail much earlier in the day in Bedford.**
Event Narrative Thunderstorm winds downed trees across the county. Damage values are estimated.

Event **Hail**
Magnitude **0.88 in.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Social Media**
NCEI Data Source **CSV**
Begin Date **2015-07-13 17:17 EST-5**
Begin Location **1NE CEDAR BLUFF**
Begin Lat/Lon **37.09/-81.76**
End Date **2015-07-13 17:17 EST-5**
End Location **1NE CEDAR BLUFF**
End Lat/Lon **37.09/-81.76**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage
Crop Damage
Episode Narrative **A line of thunderstorms associated with a larger cluster of storms advanced southeast through the region. A large number of trees were downed across the area, and some storms produced large hail during the late afternoon and early evening. An isolated severe storm not associated with the thunderstorm complex generated quarter size hail much earlier in the day in Bedford.**
Event Narrative

Event **High Wind**
Magnitude **50 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Law Enforcement**
NCEI Data Source **CSV**
Begin Date **2015-11-18 04:00 EST-5**
End Date **2015-11-18 18:00 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **10.00K**
Crop Damage **0.00K**
Episode Narrative **High pressure was wedged against the eastern face of the Appalachians, while a deep low pressure system passed across the central Plains states. The tight pressure gradient between the two features resulted in 60 to 65 knot southeasterly low level jet along the central Appalachians. Winds were particularly strong on the west side of the actual ridge lines, where downslope flow acted to draw the winds of the low level jet toward the surface, resulting in surface gusts 50 to nearly 60 mph.**
Event Narrative Several trees and powerlines were blown down at multiple locations across Tazewell county at various times through the day due to persistent damaging southeasterly winds.

Event **Winter Weather**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Newspaper**

NCEI Data Source CSV
Begin Date 2016-01-05 06:30 EST-5
End Date 2016-01-05 16:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 2/0
Property Damage
Crop Damage 0.00K
Episode Narrative A cold front pushed through the region during the overnight hours January 4th/5th resulting in localized snow squalls across portions of the western highlands of Virginia. These squalls produced 1-2 inches of snow in a very short period of time during rush hour that resulted in several accidents.
Event Narrative Multiple vehicle accidents were reported across portions of southeast West Virginia and far Western portions of Virginia due to snowy and icy conditions. Snow squalls coupled with temperatures in the mid-20's were determined to be the primary cause of an accident with injuries near the Country Club in Tazewell County. Multiple tractor trailers reported having issues along Falls Mills Road according to Tazewell County Warning Point.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2016-01-22 03:00 EST-5
End Date 2016-01-23 21:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A significant winter storm pushed from southwest to northeast, spreading periods of moderate to heavy snowfall across portions of southwest Virginia January 22nd through the 23rd. Snowfall continued through the day Friday and into Saturday before coming to an end after sunset. Accumulations from 6 to 12 inches of snow were commonplace, with portions of the higher elevations well over a foot of snowfall. Sleet mixed in at times, especially south and west of the Blue Ridge Mountains.
Event Narrative Snowfall amounts between 8 and 14 inches were observed across several locations throughout the county. The highest accumulation report was recieved out of Burkes Garden, where 14 inches was measured. A brief period of sleet was also reported during this storm.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-02-08 16:35 EST-5
End Date 2016-02-11 17:35 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage 0.00K
Episode Narrative A strong cyclone sank into the Ohio Valley and then remain near stationary for three days. Two separate cold fronts associated with this low passed through the region. With passage of the first front a rain/snow mix developed. The passage of the second front would encourage more robust snow amounts.
Event Narrative Snowfall amounts between 6 to 7 inches were observed across several locations in the county. The highest accumulation was in the Tazewell area where 7 inches was estimated.

Event Winter Storm
State VIRGINIA
County/Area TAZEWELL
WFO RNK

Report Source Public
NCEI Data Source CSV
Begin Date 2016-02-14 12:15 EST-5
End Date 2016-02-16 02:00 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage 0.00K
Episode Narrative A strong winter storm took a favorable track for heavy snow and a wintry mix, moving from the southeast U.S. into New England. This resulted in widespread heavy snow across southwest Virginia. In the mountains, snowfall in excess of 6-10 inches was common with small amounts of freezing rain. East of the Blue Ridge, while some locations did get up to 6 inches of snow, the freezing rain amounts were far more significant. In the wake of the storm, strong winds were seen through the region. Coupled with the icy conditions, this led to numerous traffic accidents and power outages.
Event Narrative Snowfall amounts between 6 to 8 inches were observed across several locations in the county. The highest accumulation was in the Cedar Bluff area where 8 inches was measured. Small amounts of sleet were also observed with this storm.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source State Official
NCEI Data Source CSV
Begin Date 2016-03-14 15:25 EST-5
Begin Location 0W GRATTON
Begin Lat/Lon 37.1301/-81.421
End Date 2016-03-14 15:25 EST-5
End Location 0W GRATTON
End Lat/Lon 37.1301/-81.421
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Early morning stratus associated with high pressure wedged against the eastern face of the Appalachians eroded by early afternoon across much of the mid-Atlantic region due to strong daytime heating. This heating allowed surface temperatures to rise into the upper 60s and low 70s, while CAPE values increased into the 1000-1500 J/kg range. A strong upper level disturbance passed across the central Appalachians during the afternoon, triggering scattered showers and thunderstorms, a few of which intensified to severe levels. Lower freezing levels aloft due to the pool of cool air associated with the upper level disturbance proved conducive for the development of large hail during this event.
Event Narrative

Event High Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-04-02 19:00 EST-5
End Date 2016-04-03 00:35 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage
Episode Narrative A cold front moved through the area the afternoon of April 2nd, 2016. Wind gusts 58 MPH and greater brought down trees and power lines.

Event Narrative High winds blew trees down in Pounding Mill, Jewell Ridge, and North Tazewell. Damage values are estimated.

Event Hail
Magnitude 0.75 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2016-05-02 13:52 EST-5
Begin Location 1W YARDS
Begin Lat/Lon 37.28/-81.34
End Date 2016-05-02 13:52 EST-5
End Location 1W YARDS
End Lat/Lon 37.28/-81.34
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A cold front situated across the Ohio Valley and extending into New England early on May 2nd began sagging south into an unstable air-mass during the afternoon and early evening. Scattered severe storms formed along this boundary, impacting a large portion of the Mid-Atlantic region, producing large hail and damaging winds.
Event Narrative

Event Hail
Magnitude 1.50 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2016-05-02 14:00 EST-5
Begin Location 1E YARDS
Begin Lat/Lon 37.28/-81.3
End Date 2016-05-02 14:00 EST-5
End Location 1E YARDS
End Lat/Lon 37.28/-81.3
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A cold front situated across the Ohio Valley and extending into New England early on May 2nd began sagging south into an unstable air-mass during the afternoon and early evening. Scattered severe storms formed along this boundary, impacting a large portion of the Mid-Atlantic region, producing large hail and damaging winds.
Event Narrative

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Trained Spotter
NCEI Data Source CSV
Begin Date 2016-06-04 17:20 EST-5
Begin Location 1E RICHLANDS

Begin Lat/Lon 37.1/-81.8
End Date 2016-06-04 17:20 EST-5
End Location 1E RICHLANDS
End Lat/Lon 37.1/-81.8
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A stationary boundary across the region would transition into a warm front, helping to trigger severe thunderstorms. This was the beginning of a very active weather pattern for the afternoons of the fourth and fifth of June.
Event Narrative Thunderstorm winds knocked several large trees down near Richlands.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-04 17:33 EST-5
Begin Location 0N RICHLANDS ARPT
Begin Lat/Lon 37.08/-81.83
End Date 2016-06-04 17:33 EST-5
End Location 0N RICHLANDS
End Lat/Lon 37.1/-81.82
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 3.00K
Crop Damage 0.00K
Episode Narrative A stationary boundary across the region would transition into a warm front, helping to trigger severe thunderstorms. This was the beginning of a very active weather pattern for the afternoons of the fourth and fifth of June.
Event Narrative A few trees reported down in locations west of Richlands due to thunderstorm winds.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-04 17:36 EST-5
Begin Location 2ENE RICHLANDS
Begin Lat/Lon 37.1074/-81.7926
End Date 2016-06-04 17:36 EST-5
End Location 2ENE RICHLANDS
End Lat/Lon 37.1074/-81.7926
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 150.00K
Crop Damage 0.00K
Episode Narrative A stationary boundary across the region would transition into a warm front, helping to trigger severe thunderstorms. This was the beginning of a very active weather pattern for the afternoons of the fourth and fifth of June.
Event Narrative Thunderstorm winds knocked over a tree along the railroad track and broke a railroad gate.

Event Thunderstorm Wind

Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-16 20:15 EST-5
Begin Location 1WSW DORAN
Begin Lat/Lon 37.0947/-81.8633
End Date 2016-06-16 20:15 EST-5
End Location 1WSW DORAN
End Lat/Lon 37.0947/-81.8633
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage 0.00K
Episode Narrative At the beginning of a day, a low was centered over the Great Lakes region with an associated cold front extending back through the midwest. An upper level disturbance ahead of the low would trigger pulse convection in the mountains during the afternoon, but become more organized going eastward as the front advanced east. High moisture levels and warm temperatures contributed to the development of numerous showers and thunderstorms.
Event Narrative Thunderstorm winds knocked down power lines along Redwood Road.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-16 20:25 EST-5
Begin Location 1NE CEDAR BLUFF
Begin Lat/Lon 37.0882/-81.7629
End Date 2016-06-16 20:25 EST-5
End Location 1NE CEDAR BLUFF
End Lat/Lon 37.0882/-81.7629
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage 0.00K
Episode Narrative At the beginning of a day, a low was centered over the Great Lakes region with an associated cold front extending back through the midwest. An upper level disturbance ahead of the low would trigger pulse convection in the mountains during the afternoon, but become more organized going eastward as the front advanced east. High moisture levels and warm temperatures contributed to the development of numerous showers and thunderstorms.
Event Narrative One tree was blown down by thunderstorm wind in the Cedar Bluff Area.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-21 17:18 EST-5
Begin Location 1E RICHLANDS ARPT
Begin Lat/Lon 37.0822/-81.8133
End Date 2016-06-21 17:18 EST-5
End Location 1E RICHLANDS ARPT

End Lat/Lon 37.0822/-81.8133
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 2.50K
Crop Damage 0.00K
Episode Narrative A cold front was located from West Virginia into Pennsylvania. To the south of this boundary, unstable air was in placed with CAPES ranging from 1500-2000 j/kg. This unstable air mass, combined with moderate mid level shear, triggered a severe thunderstorm in Tazewell County.
Event Narrative Thunderstorm winds blew down multiple trees along Kents Ridge Road near Richlands.

Event Thunderstorm Wind
Magnitude 55 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-23 18:52 EST-5
Begin Location 1N BLUEFIELD
Begin Lat/Lon 37.2603/-81.279
End Date 2016-06-23 18:52 EST-5
End Location 1N BLUEFIELD
End Lat/Lon 37.2603/-81.279
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 10.00K
Crop Damage 0.00K
Episode Narrative While historic flooding that struck southeast West Virginia and the Alleghany Highlands of Virginia will be the event most remembered on this day, numerous severe thunderstorms impacted southwest Virginia, as well. A nearly stationary boundary over our area interacted with a very warm and unstable air mass, triggering multiple rounds of severe storms. This prolonged severe weather event started in the morning and continued well into the evening.
Event Narrative Thunderstorm winds downed numerous trees along State Route 102.

Event Thunderstorm Wind
Magnitude 52 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-06-23 19:15 EST-5
Begin Location 1S BLUEFIELD
Begin Lat/Lon 37.24/-81.28
End Date 2016-06-23 19:15 EST-5
End Location 1S BLUEFIELD
End Lat/Lon 37.24/-81.28
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative While historic flooding that struck southeast West Virginia and the Alleghany Highlands of Virginia will be the event most remembered on this day, numerous severe thunderstorms impacted southwest Virginia, as well. A nearly stationary boundary over our area interacted with a very warm and unstable air mass, triggering multiple rounds of severe storms. This prolonged severe weather event started in the morning and continued well into the evening.
Event Narrative Thunderstorm winds blew down multiple trees just west of Bluefield.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2016-07-08 14:52 EST-5
Begin Location 1E YARDS
Begin Lat/Lon 37.2783/-81.3003
End Date 2016-07-08 14:52 EST-5
End Location 1E YARDS
End Lat/Lon 37.2783/-81.3003
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A strong upper level disturbance pushed across the central Appalachians, triggering an organized line of severe thunderstorms. Strong daytime heating ahead of an approaching cold front supported afternoon temperatures in the upper 80s and the low 90s. CAPE values approached 2500 J/Kg, while mid level winds were observed in the 30 to 40 knot range.
Event Narrative Two power poles were blown down by thunderstorm winds along Angel Lane.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source COOP Observer
NCEI Data Source CSV
Begin Date 2016-08-14 17:46 EST-5
Begin Location 1E BURKES GARDEN
Begin Lat/Lon 37.1/-81.34
End Date 2016-08-14 17:46 EST-5
End Location 1E BURKES GARDEN
End Lat/Lon 37.1/-81.34
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.60K
Crop Damage
Episode Narrative Afternoon showers and thunderstorm developed within a hot and humid airmass in advance of an approaching cold front. A couple of these storms increased in intensity to produce damaging winds that downed trees and large tree limbs.
Event Narrative Thunderstorm winds blew large tree limbs down. Damage values are estimated.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Law Enforcement
NCEI Data Source CSV
Begin Date 2017-03-01 11:00 EST-5
Begin Location 1N SAYERSVILLE
Begin Lat/Lon 37.1987/-81.6298
End Date 2017-03-01 11:20 EST-5
End Location 3ESE BENBOW
End Lat/Lon 37.047/-81.4679
Deaths Direct/Indirect 0/0 (fatality details below, when available...)

Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative A fast-moving line of thunderstorms moved across Kentucky and West Virginia during the late morning and afternoon hours of March 1st, entering western Virginia shortly before noon. Strong heating was observed ahead of the line, with temperatures warming into the 60s and 70s across the central Appalachians, and around 80 degrees in spots across the Piedmont. This provided the necessary instability for the line of storms to sustain severe levels as it moved across the region, producing long swaths of wind damage.
Event Narrative Several large trees and numerous large tree limbs were blown down across Tazewell County.

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-04-23 16:30 EST-5
Begin Location 1NNW RAVEN
Begin Lat/Lon 37.0908/-81.8766
End Date 2017-04-24 09:00 EST-5
End Location 1SW MOUTH OF LAUREL
End Lat/Lon 37.1105/-81.7427
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 5.00K
Crop Damage 0.00K
Episode Narrative Several waves of low pressure moved across the area as an upper level low closed off over the southeastern U.S. Signiifcant rainfall began early on April 22nd over far southwest Virginia and the rainfall persisted on and off over the next four days with mainly moderate rates (0.10��� to 0.25��� per hour) as the upper low drifted very slowly eastward from the lower Mississippi Valley toward the southeastern states. 24-hour totals ending 12z (0700 EST) on the 23rd ranged from less than 0.50 inches over the James River basin up to 1.25��� to 1.75��� across parts of the Roanoke, New and Dan basins. The heaviest rains April 23-24 fell across the western and central river basins with amounts ranging from 2 to 5 inches. Another 1 to 3 inches with isolated higher amounts fell mainly across the foothills and piedmont in the next 24-hours. Storm total rainfall for the four-day period ending at 12z (0700 EST) on the 25th ranged from 3 to 9+ inches with highest amounts in parts of the Blue Ridge mountains and foothills in Patrick, Carroll and Henry counties. Busted Rock #2 IFLOWS (BUEV2) led the way with 9.53 over the 4-day period. Widespread small stream flooding resulted with numerous larger rivers that approached or exceeded flood stage including portions of the Clinch, New, Roanoke and Dan rivers. Return frequency intervals for the flooding were generally in the 5-year to 10-year range (0.20-0.10 annual exceedance probability), but close to 20-year (0.05 AEP) in the lower Dan River. Numerous roads were closed by flooding in at least a dozen counties.
Event Narrative Old Kentucky Turnpike in Cedar Bluff was completely covered by flood waters from either Indian Creek or the Clinch River. Water flooded a basement causing an oil tank and hot water heater to overturn. Water was also reported up to the basement level of a home along Route 67 in Raven. The Clinch River gage at Richlands (RLRV2) crested at 10.68 feet at 0200 EST. Minor Flood stage is 10 feet.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-05-24 14:00 EST-5
Begin Location 1N NORTH TAZEWELL
Begin Lat/Lon 37.14/-81.53
End Date 2017-05-24 14:00 EST-5
End Location 1N NORTH TAZEWELL
End Lat/Lon 37.14/-81.53

Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 4.00K
Crop Damage 0.00K
Episode Narrative A warm front extended east across the central Appalachians, allowing cool stable air to the north and warm unstable conditions to the south. The differential heating coupled with ample lift and low level shear provided an environment ripe for rotating thunderstorms, many of which were already ongoing through the early afternoon hours. In all, the strongest storms produced extensive wind damage, especially in the Grayson Highlands of Virginia, with damage proceeding east of the Blue Ridger.
Event Narrative Thunderstorm winds downed a tree that also took down powerlines along Blackhorse Road.

Event Hail
Magnitude 1.00 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2017-05-27 17:30 EST-5
Begin Location 0N THOMPSON VLY
Begin Lat/Lon 37.08/-81.55
End Date 2017-05-27 17:30 EST-5
End Location 0N THOMPSON VLY
End Lat/Lon 37.08/-81.55
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A cold front approached and stalled over the Mid-Atlantic region during the early afternoon on May 27th, allowing numerous strong to severe thunderstorms to form. Some of these storms produced large hail across portions of the Virginia highlands, with a storm or two moving east of the Blue Ridge Mountains.
Event Narrative

Event Hail
Magnitude 0.88 in.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Broadcast Media
NCEI Data Source CSV
Begin Date 2017-05-27 17:58 EST-5
Begin Location 1E CLAYPOOL HILL
Begin Lat/Lon 37.07/-81.76
End Date 2017-05-27 17:58 EST-5
End Location 1E CLAYPOOL HILL
End Lat/Lon 37.07/-81.76
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative A cold front approached and stalled over the Mid-Atlantic region during the early afternoon on May 27th, allowing numerous strong to severe thunderstorms to form. Some of these storms produced large hail across portions of the Virginia highlands, with a storm or two moving east of the Blue Ridge Mountains.
Event Narrative

Event Flood
-- Flood Cause Heavy Rain
State VIRGINIA

County/Area TAZEWELL
WFO RNK
Report Source Emergency Manager
NCEI Data Source CSV
Begin Date 2017-06-16 17:50 EST-5
Begin Location 1ESE BLUEFIELD
Begin Lat/Lon 37.24/-81.26
End Date 2017-06-16 20:50 EST-5
End Location 1ESE BLUEFIELD
End Lat/Lon 37.2448/-81.26
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.00K
Crop Damage 0.00K
Episode Narrative Evening convection redeveloped on the 16th with the Blue Ridge foothills and southside VA counties (Henry, Pittsylvania, Franklin and Halifax) once again receiving the bulk of the rainfall. Rainfall was estimated by radar at 1 to 2.5 inches in a few hours. Several reports were received of flooding issues in the Bassett area north of Martinsville. Lesser amounts produced minor flooding in Tazewell County.
Event Narrative Reported urban flooding caused several streets to be flooded along Beaver Pond Creek. Rainfall was 1 to 1.25 inches according to radar estimates and nearby rain gages.

Event Strong Wind
Magnitude 40 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source 911 Call Center
NCEI Data Source CSV
Begin Date 2017-10-09 03:00 EST-5
End Date 2017-10-09 04:30 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 1.00K
Crop Damage
Episode Narrative The remnants of Hurricane Nate lifted northeast through the Tennessee Valley on October 8th and 9th. To the east of this system, strong winds were observed the lower levels of the atmosphere. These strong winds, coupled with a saturated ground from heavy rain, provided prime conditions for numerous trees to be blown over across southwest Virginia.
Event Narrative Strong winds knocked over one tree onto U.S. Highway 460 in Pounding Mill. A second tree was blown down by strong winds in Thompson Valley.

Event Extreme Cold/Wind Chill
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Public
NCEI Data Source CSV
Begin Date 2018-01-05 02:14 EST-5
End Date 2018-01-05 10:01 EST-5
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage
Crop Damage
Episode Narrative A strong area of low pressure off the Atlantic coast rapidly strengthened, ushering in strong winds and an extremely frigid arctic air mass. Record cold temperatures combined with these winds created dangerous wind chills.
Event Narrative Wind chill temperatures fell to -20��F or below at Burkes Garden on the 5th.

Event **Flood**
-- Flood Cause **Heavy Rain**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **River/Stream Gage**
NCEI Data Source **CSV**
Begin Date **2018-02-11 03:00 EST-5**
Begin Location **2SE RICHLANDS**
Begin Lat/Lon **37.0865/-81.7982**
End Date **2018-02-12 03:00 EST-5**
End Location **1WSW POUNDING MILL**
End Lat/Lon **37.0739/-81.7429**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **A broad upper level trough with a slow-moving frontal boundary brought an extended period of mainly light to moderate rainfall that began on the afternoon of the 10th and persisted well into the evening of the 11th. Several rivers reached flood stage and a number of roads were reported closed. Rainfall amounts ranged from 2 to 3 inches in a 24-hour period ending at 7 AM EST on the 11th and for many locations it was one of the wettest February days on record. 48-hour storm total rainfall (ending 7 AM EST) on the 12th) reached 4 to 5 inches in several locations.**
Event Narrative **The Clinch River at Richlands (RLRV2) crested at 10.97 feet (Minor Flood stage - 10 ft.). In addition, a portion of Route 608, Cove Road, was reported closed by high water.**

Event **High Wind**
Magnitude **52 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **911 Call Center**
NCEI Data Source **CSV**
Begin Date **2018-03-01 22:10 EST-5**
End Date **2018-03-02 21:45 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **12.50K**
Crop Damage
Episode Narrative **A cold front crossed the region on the evening of March 1st. Behind the front very strong winds a few thousand feet off the surface were brought downward due to good mixing within the lower levels. The long lasting, greater than 60 mph winds helped produce widespread damage that included hundreds of trees down and hundreds of power lines down, thousands of people left without power for a period of time, damaged structures due to the falling trees, and one case of an indirect injury as a motorist drove into a downed tree in Buckingham County. The damaging winds continued through mid-day March 3rd.**
Event Narrative **Winds brought down five large trees in the county, two of which fell on power lines. The trees fell along Routes 604, 615, 26, and Baptist Valley Road. Damage values are estimated.**

Event **Winter Storm**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **Broadcast Media**
NCEI Data Source **CSV**
Begin Date **2018-03-24 05:00 EST-5**
End Date **2018-03-25 00:00 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage

Crop Damage
Episode Narrative An area of low pressure tracked eastward from the Tennessee Valley to the coast of the Carolinas, before swinging northward along the U.S. east coast. Initially, temperatures were warm enough for rain to fall, but as colder air worked its way into the area behind the departing low pressure, the precipitation changed over to snow. Late in the event, warmer air just off the surface worked its way into parts of the area resulting in a period of freezing rain across Carroll County. Snowfall amounts generally ranged from 5 to 10 inches just east of the crest of the Blue Ridge and parts of the Grayson Highlands to 10 to 16 inches across the New River Valley. Freezing rain accretion was a trace. A total of 58,000 electric customers were without power. State police reported twenty-four crashes in its Wytheville district and four in its Salem district.
Event Narrative Snowfall totals from across the county include 8.5 inches three miles northwest of Tazewell, 9.0 inches two miles east-southeast of Tiptop, 10.0 inches at Bluefield, and 12.0 inches at Jewell Ridge. Approximately 1800 electric customers were without power.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2018-04-04 01:38 EST-5
Begin Location 2NNW PLEASANT HILL
Begin Lat/Lon 37.2066/-81.7573
End Date 2018-04-04 01:38 EST-5
End Location 2NNW PLEASANT HILL
End Lat/Lon 37.2066/-81.7573
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage
Episode Narrative A cold front pushed a line of showers and thunderstorms into parts of southwest Virginia. The thunderstorms produced wind damage by knocking down two trees in Tazewell County before dissipating. Another thunderstorm blew down a few trees in Marion within Smyth County.
Event Narrative One tree was blown down near the intersection of Bearwallow Road and Greasey Creek Road.

Event Thunderstorm Wind
Magnitude 50 kts.
State VIRGINIA
County/Area TAZEWELL
WFO RNK
Report Source Department of Highways
NCEI Data Source CSV
Begin Date 2018-04-04 01:45 EST-5
Begin Location 1E RAVEN
Begin Lat/Lon 37.0816/-81.8525
End Date 2018-04-04 01:45 EST-5
End Location 1E RAVEN
End Lat/Lon 37.0816/-81.8525
Deaths Direct/Indirect 0/0 (fatality details below, when available...)
Injuries Direct/Indirect 0/0
Property Damage 0.50K
Crop Damage
Episode Narrative A cold front pushed a line of showers and thunderstorms into parts of southwest Virginia. The thunderstorms produced wind damage by knocking down two trees in Tazewell County before dissipating. Another thunderstorm blew down a few trees in Marion within Smyth County.
Event Narrative One large tree was blown down along Daw Road.

Event **Flood**
-- Flood Cause **Heavy Rain**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **River/Stream Gage**
NCEI Data Source **CSV**
Begin Date **2018-04-16 02:00 EST-5**
Begin Location **1NW CEDAR BLUFF**
Begin Lat/Lon **37.0908/-81.7889**
End Date **2018-04-16 12:00 EST-5**
End Location **1NNE CEDAR BLUFF**
End Lat/Lon **37.0895/-81.7641**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **0.00K**
Crop Damage **0.00K**
Episode Narrative **A strong cold front propelled by a deep upper trough that took on a negative tilt, pushed through the region on April 15 producing severe weather and heavy rainfall. The speed of convective elements prevented any flash flooding but longer duration flooding occurred on several rivers and streams, mainly in the minor category. Rainfall ranged from 2 to 4 inches with locally higher amounts up to nearly 4.5 inches in 24-hours ending at 7 AM on the 16th. The highest amounts were roughly a 5-year recurrence interval (0.2 Annual exceedance probability).**
Event Narrative **The Clinch River at Richlands (RLRV2) crested at 10.62 feet just over Minor flood stage of 10 ft.**

Event **Strong Wind**
Magnitude **25 kts.**
State **VIRGINIA**
County/Area **TAZEWELL**
WFO **RNK**
Report Source **911 Call Center**
NCEI Data Source **CSV**
Begin Date **2018-04-23 04:35 EST-5**
End Date **2018-04-23 04:35 EST-5**
Deaths Direct/Indirect **0/0 (fatality details below, when available...)**
Injuries Direct/Indirect **0/0**
Property Damage **20.00K**
Crop Damage
Episode Narrative **Strong winds caused a trailer home to be blown off its foundation.**
Event Narrative **A trailer home was blown off its foundation by strong winds. The wind gust was measured from the nearby Bluefield, West Virginia airport.**

Appendix B

Town of Bluefield

Supplement to the CPPDC Plan

Last Updated: 2011

Table of Contents

Hazard Identification and Risk Assessment

Section 1 - Introduction

Background

In 2002, the Town of Bluefield was awarded several FEMA Hazard Mitigation Grant Program (HMGP) grants from DR-1386-VA for 2001 flooding. One of these grants provided funding for Bluefield to develop a multi-hazard mitigation plan to satisfy Disaster Mitigation Act of 2000 (DMA2K) requirements. This funding was awarded prior to Virginia establishing a statewide approach to develop these plans. Originally, Bluefield had planned to develop a separate, stand-alone plan to cover all DMA2K requirements. In 2002, the Virginia Department of Emergency Management established the policy of using Virginia Planning District Commissions to develop multi-jurisdictional plans. After the Cumberland Plateau Planning District Commission (CPPDC) was awarded funding, Bluefield staff met with CPPDC representations and decided to make the Bluefield efforts a supplement to the District Plan. Instead of having the limited grant funds for Bluefield used to duplicate many of the sections of the District Plan, the Bluefield supplement would focus on gathering more detailed information for the town for the hazard identification and risk assessment (HIRA) and the mitigation strategy. This also allowed Bluefield to focus on those issues that the town's government controls, such as local ordinances, rather than those issues that are controlled at the Tazewell County level, such as VDOT road improvement plans

This Appendix, to the CPPDC Plan, provides that supplemental HIRA and strategy information specific to Bluefield, Virginia be incorporated in the regional plan. For certain hazards, such as flooding, grants funds were to used to develop more detailed hazard and critical facility mapping than the CPPDC Plan funds could gather. This supplement also indicates when any additional information has been gathered or when the CPPDC Plan information and description apply. For example, additional information was gathered for karst (sinkhole) hazards, included detailed mapping in Bluefield. This has been included in the landslide section of this Bluefield supplement, but no additional descriptive information was included about basic landslides, which was covered in depth by the CPPDC Plan. This Appendix was developed by the Virginia Tech Center for Geospatial Information Technology, under a subcontract with Anderson and Associates of Blacksburg, Virginia. Additional data was provided by Marshall Miller and Associates and Willis Engineering, both in Bluefield, Virginia.

Town Description

The Town of Bluefield, Virginia is located at the northeast corner of Tazewell County, adjacent to the Jefferson National Forest. Bluefield is located at the base of East River Mountain in the Blue Ridge Mountains, with a total area of 7.6 square miles. The town developed from the railroad industry, with a need to serve the coal mines in Pocahontas, Virginia. The Town of Bluefield has been known by various names throughout the years.

In 1860 the town was called Pin Hook, in 1883 it was renamed to Harman and then later to Graham. In 1924 the Town of Graham took the name of Bluefield like Bluefield, West Virginia.

Figure B.1 shows the 2004 town limits of Bluefield, along with locations for structures, roads, and railroads. The original town limits consisted of the areas along Business Rt. 19 in the northern part of town. As the population of the area has grown, a series of boundary adjustments and annexations has expanded the Town south into the next valley along Rt. 460 and up the northern slope of East River Mountain to the county boundary with Bland County. Nicknamed the 'Virginia's Tallest Town", Bluefield elevations range from around 2,400 ft to almost 4,000 ft above sea level on East River Mountain. The census of 2000 indicates that the town has a population of 5,078 people. Because of the West Virginia state boundary to the east and the Bland County boundary to the south, any future growth of the Town will occur either to the west along Rt. 460 or north towards the Town of Pocahontas.

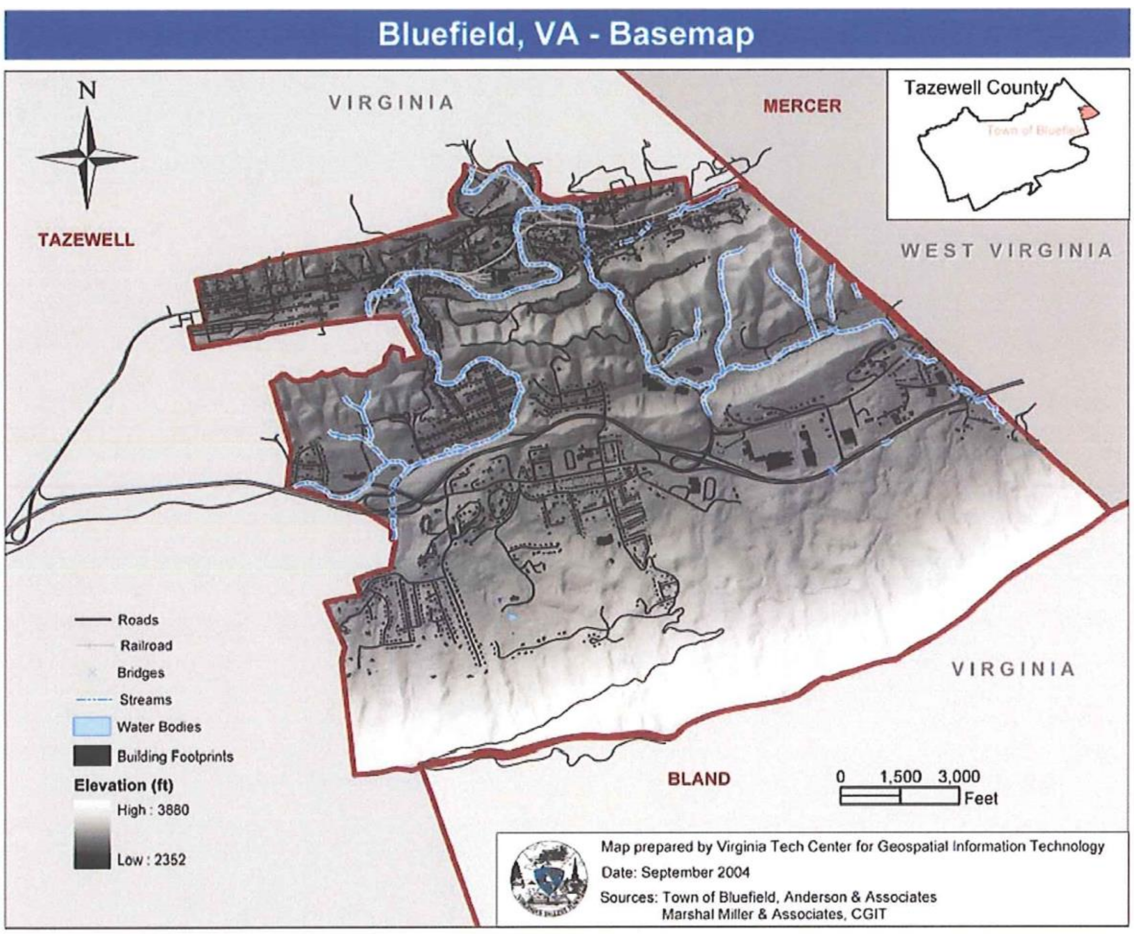


Figure B.1. Bluefield Base Map.
Note: All numbered figures in this Appendix are provided in a format for black and white reproduction. Full page, color versions of all figures are included at the end of this Appendix.

Watersheds

The Town of Bluefield has six major sub-watersheds within its boundaries. All of the sub-watersheds for Bluefield are included in the New River Basin. The watersheds include Mudfork, Wrights Valley Creek, Bluestone River, Beaver Pond Creek, Whitney Branch and Brush Fork. A majority of the town's water supply comes from the Bluestone River watershed. Figure B.2 illustrates the sub-watershed boundaries.

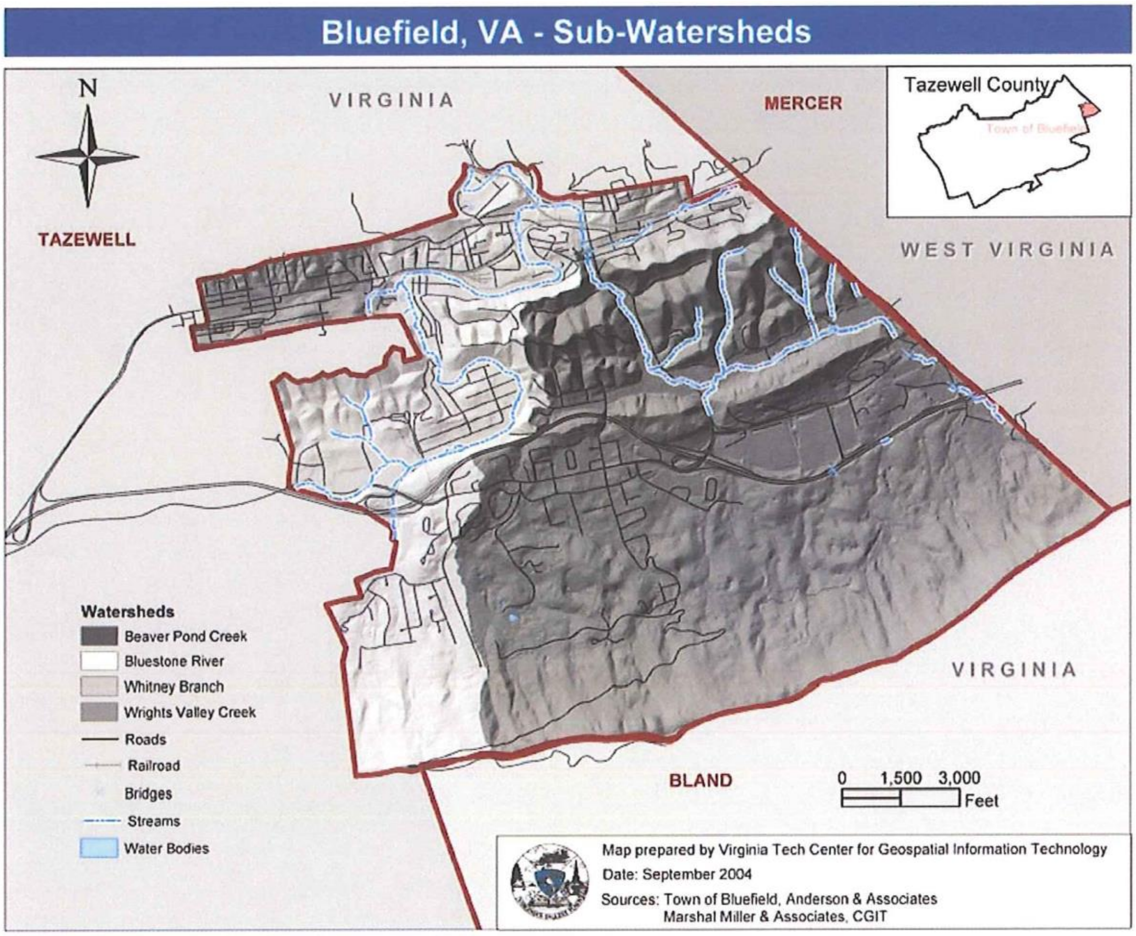


Figure B.2: Bluefield Sub-Watersheds

Critical Facilities

Town of Bluefield critical facilities were derived from the town's building records. Bridge locations were based on aerial photography and maps of roads, railroads, and streams. Structure values were located for specific areas and average neighborhood values were used in areas that structure values were not readily available and if no neighborhood value was available, the structure value from Census 2000 data was used for the average building value ($75,600). Figure B.3 details the location of critical facilities throughout town.

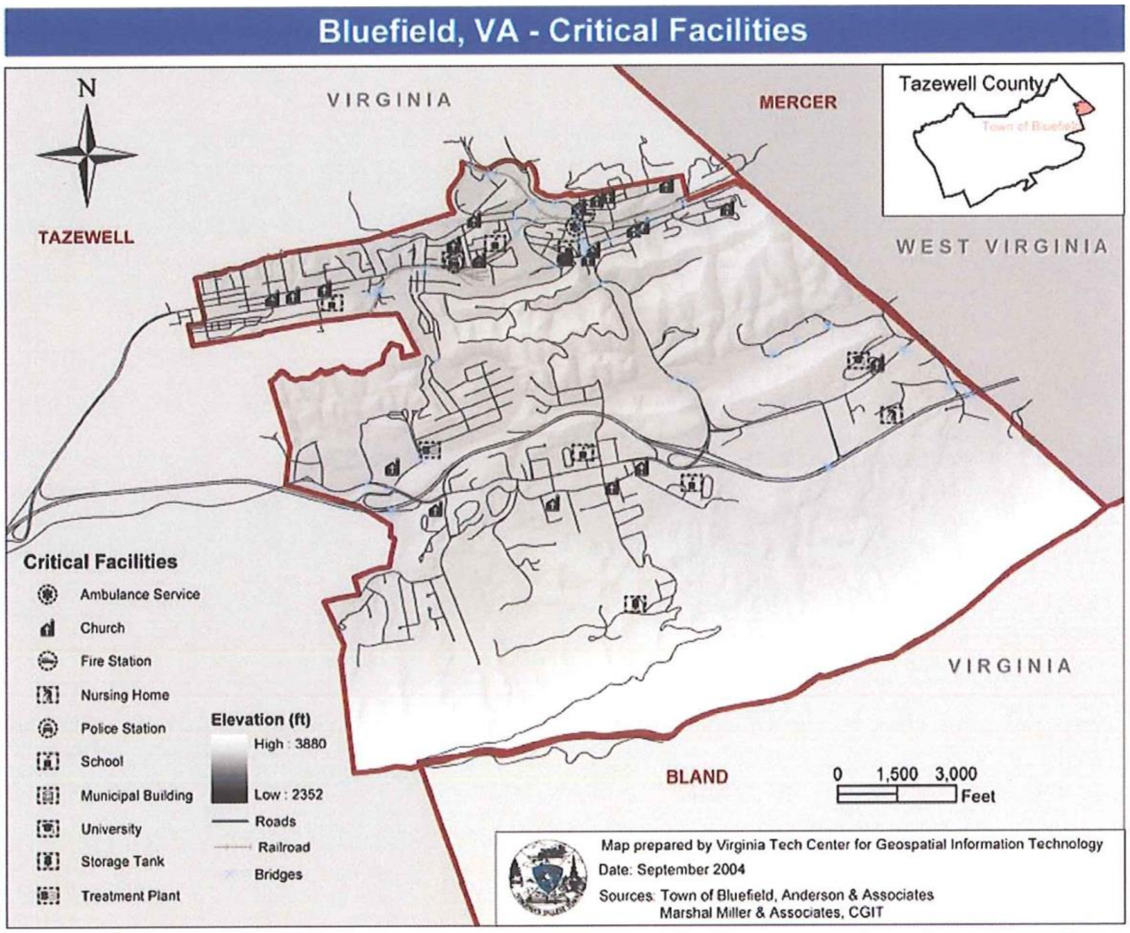


Figure B.3. Bluefield Critical Facilities

Section 2 - Hazard Identification

The FEMA guidelines emphasize using "available data" for this plan, especially for the Hazard Identification and Risk Assessment (HIRA). As mentioned earlier, this Appendix was developed by the Virginia Tech Center for Geospatial Information Technology, under a subcontract with Anderson and Associates of Blacksburg, Virginia. Besides the data provided by the Town of Bluefield, the following organizations all provided data used for this HIRA:Anderson and Associates, Inc.

- Bluefield Daily Telegraph
- Cumberland Plateau Planning District Commission (Virginia)
- Dewberry
- Federal Emergency Management Agency
- Marshall Miller and Associates
- Region I Planning and Development Council (West Virginia)
- Tazewell County, Virginia
- Tuck Engineering
- US Census Bureau
- US Geological Survey
- Virginia Department of Conservation and Recreation
- Virginia Department of Emergency Management
- Virginia Department of Transportation
- Virginia Geographic Information network
- Virginia Tech Center for Geospatial Information Technology
- Willis Engineering

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards that could potentially affect the communities in the Cumberland Plateau Planning District generally include:

- Flooding
- Severe Winter Storms
- Wildfires
- Landslides
- Dam Failures
- Drought
- Earthquake
- Severe Wind
- Severe Thunderstorms
- Tornadoes
- Extreme Heat
- Karst

Probability of Hazards

The hazards that were dealt with are included in the Bluefield HIRA are listed in Table B.1. This is the same list of hazard types and levels as the CPPDC Plan. Analysis level was determined by the type of data available and the scale of data available for the analysis. Certain hazards were not dealt with as a result of the infrequency of occurrence. Dam failure, for example, was excluded from analysis as a result of no dams being located within the Town limits. Tornadoes were profiled but no analysis completed as a result of no recorded tornado touchdowns for the Town of Bluefield and also no touchdowns in Tazewell County.

Table B.1. Hazard Identifications (from CPPDC Plan).

Hazard Type	Hazard Level
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Tornado	Low
Extreme Heat	Low
Karst Topography	Low

Federally Declared Disasters

Table B.2. lists the six recent federally declared disasters for the Tazewell County, most of which had an impact on the Town of Bluefield. The sections on each hazard will give more information about specific impacts in Bluefield.

Table B.2. Recent Federal Disasters in Tazewell County.

Disaster Number	Dates	Description	Amount Damage
FEMA-1386-DR	July 7 - 10, 2001	Heavy rains Saturday, July 7, 2001, and Sunday, July 8, 2001, caused extensive flooding in Tazewell County.	$15 million
FEMA-1406-DR	March 17, 2002	Heavy rain fell over the counties located in Southwest Virginia. The event caused flash flooding and mudslides, which resulted in the isolation of families from their homes, local evacuations, and significant damage to private and public property. Damage estimate totals at $8,151,765	$8 million
FEMA-1411-DR	April 28 - May 2, 2002	On the evening of 28 April a severe weather system entered Virginia from the west and, once across the Blue Ridge Mountains, developed into a series of tornadoes. Local emergencies were declared in Bedford City, and Bedford, Campbell, Greensville, and Shenandoah Counties. On 2 May 2002, continuing severe weather impacted Virginia. Wind, rain and flood damage was again widespread with the most severe damage occurring in the southwest part of the state. In Buchanan County, heaviest damage was northeast of Grundy in the vicinity of Hurley, and was due to flash flooding and mudslides. Damaging floodwaters and strong winds also impacted nearby Tazewell County.	$500,000
FEMA-1458-DR	February 15, 2003	A major winter storm struck Virginia beginning February 15 2003 causing major flooding in Southwest Virginia and significant ice and snowfall in the Shenandoah Valley and areas of Northern Virginia. The weather pattern continued to bring warmer temperatures, melting snow/ice and more heavy rainfall, which combined to cause more local flooding.	$175,000
FEMA-1502-DR	November 18 -19, 2003	A severe storm system moved into the Commonwealth of Virginia on November 18 and 19, 2003 dumping up to 4.28 inches of rain in 12 hours resulting in flash floods through the southwestern part of Virginia. Two young children in Buchanan County died when their home was washed away by a flash flood. Preliminary assessments indicated the most severe impacts were to single-family residences, manufactured homes and private access bridges. Several apartment buildings with major damage were also identified, as well as damage to sewer pipes and private wells.	$1.6 million
FEMA-1525-DR	May 24 - June 15, 2004	A system of severe storms began moving through Southwest Virginia on May 24, 2004. Flash flooding occurred on May 24-25 in Tazewell and Russell counties. Tornadoes damaged homes in Lee County on May 28. Flash floods impacted Buchanan County and several other counties in Southwest Virginia over the June 12-15 period. One flood-damaged road, Route 772 in Russell County, remains closed.	

Section 3 - Flooding

Hazard History

Table B.3. Bluefield Flood History (Source: FEMA, VDEM, Town of Bluefield, Bluefield Daily Telegraph).

	Damages
September 28, 1878	Bridges across the Bluestone River were washed away from impacts of flooding.
March 1, 1955	
January 29, 1957	Damages estimated over $100,000.
March 12, 1963	Damages to transportation infrastructure estimated over $7,000.
August 28, 1964	Damages estimated over $25,000. The Bluestone River was responsible for the flooding of College Avenue.
March 7, 1967	
December 30, 1969	
May 6, 1971	The downtown area impacted by this rain event caused 2.5 feet of flooding, from 1.74 inches of rain over the extent of two days. College Avenue was one of the roads inundated.
April 14, 1972	
April 4, 1977	The business district was incapacitated due to flooding. Virginia Street and College Avenue were some of the areas affected by the rain event. Traffic rerouted to the side streets, with voluntary evacuation of residents.
September 22, 1989	High winds (40 mph) and rain from tropical storm Hugo resulted in power outages and uprooted trees.
August 4, 2001	Thunderstorms during the afternoon and evening of the 4th produced hail up to dime size and flash flooding. Heavy thunderstorm rains caused Big Branch Creek to flood, 4 miles northwest of Bluefield. Heavy rain also flooded and closed several streets in Bluefield.
March 17-20, 2002	FEMA declared disaster (FEMA-1406-DR). Hockman Pike, in the mobile home park, was flooded due to the precipitation of March 20.
February 15, 2003	FEMA declared disaster (FEMA-1458-DR). A mix of rain, melting snow and sleet caused flooding and high water in many areas. Areas affected include Adria Road, South College Avenue. Sandbags were placed in front of businesses in the downtown area. Property damages to homes and businesses were very minimal as compared to past events.
November 19, 2003	FEMA declared disaster (FEMA-1502-DR). Four inches of precipitation resulted in many individuals leaving their homes. Virginia Avenue was closed due to the encroaching flood waters. Downtown businesses attempted to use sandbags to hold out the water. The Westgate shopping center and an apartment complex were evacuated. Approximately 40 houses, 12 mobile homes and 30 businesses sustained damages.
June 12, 2004	FEMA declared disaster (FEMA-1525-DR) During two hours of rain, Bluefield accumulated 2.37 inches of precipitation. Preliminary flood damage indicated that at least 20 houses and 12 businesses were impacted by the flooding. Areas affected include South College Avenue, Main Street (at intersection of Beaver Pond Creek and Whitney Branch), College Avenue, Stadium Drive and Leatherwood Lane.

Hazard Profile

The majority of flooding is flash flooding in the Town of Bluefield. Refer to the Cumberland Plateau Planning District Commission for the complete flooding hazard profile. No hurricanes have been recorded for the Town of Bluefield, but impacts from hurricanes have led to many secondary hazards. Some of these hazards include flash flooding, high winds and landslides, which are addressed later sections.

Hazard Areas

Figure B.4 illustrates the location of the floodplains throughout the Town of Bluefield, based FEMA FIRM base flood elevation and 2002 LIDAR elevation mapping.

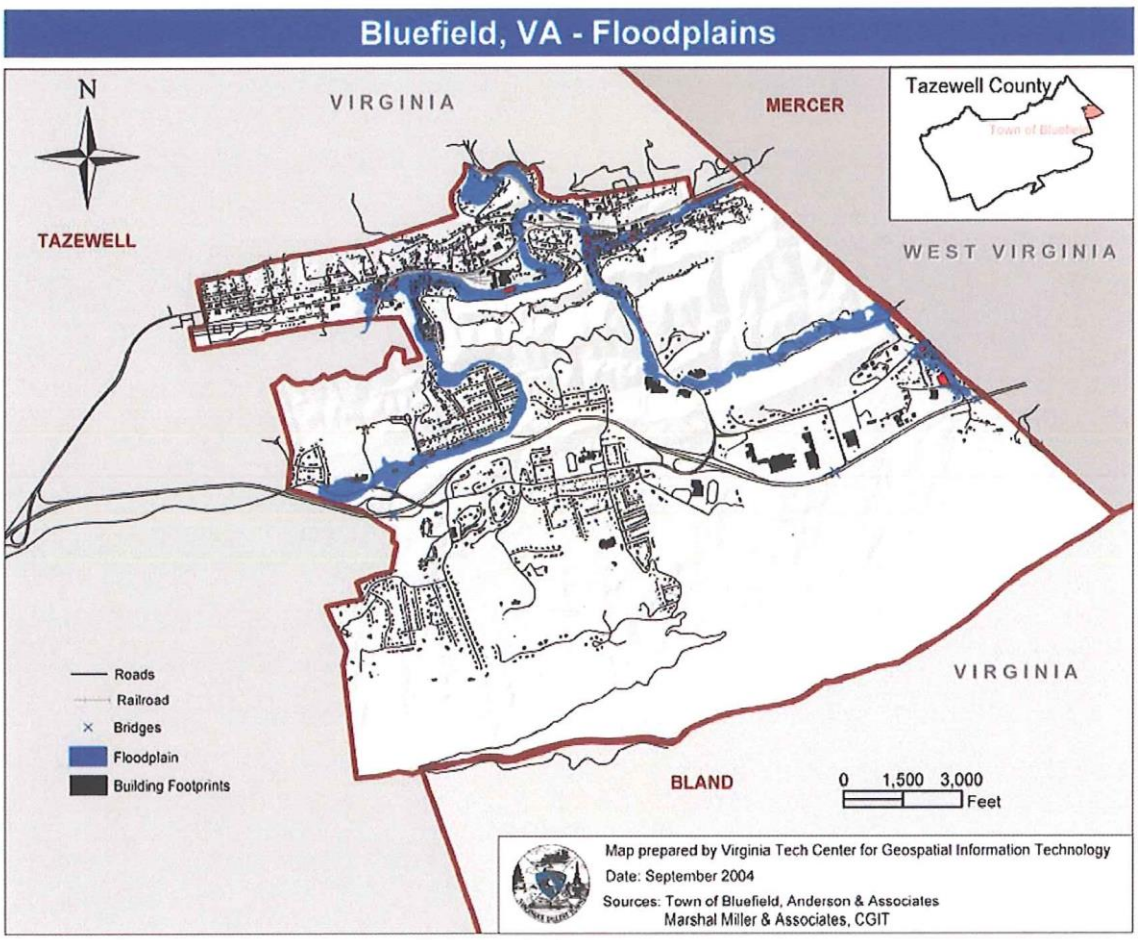


Figure B.4. Bluefield Floodplain Boundaries.

Vulnerability Analysis

Flooding is a major concern to the Town of Bluefield. Many homes and businesses are affected by flooding on an annual basis. Figure B.5. shows the location of critical facilities in the floodplains. From the analysis of buildings in the floodplain, 309 structures are at some risk of flooding with a total value of over $40 million (7% of the total building value for the town). From the buildings located in the floodplain, five of the structures are labeled critical facilities. Tables B.4- B.6 provide a breakdown of the risk from flooding and corresponding values for the structures.

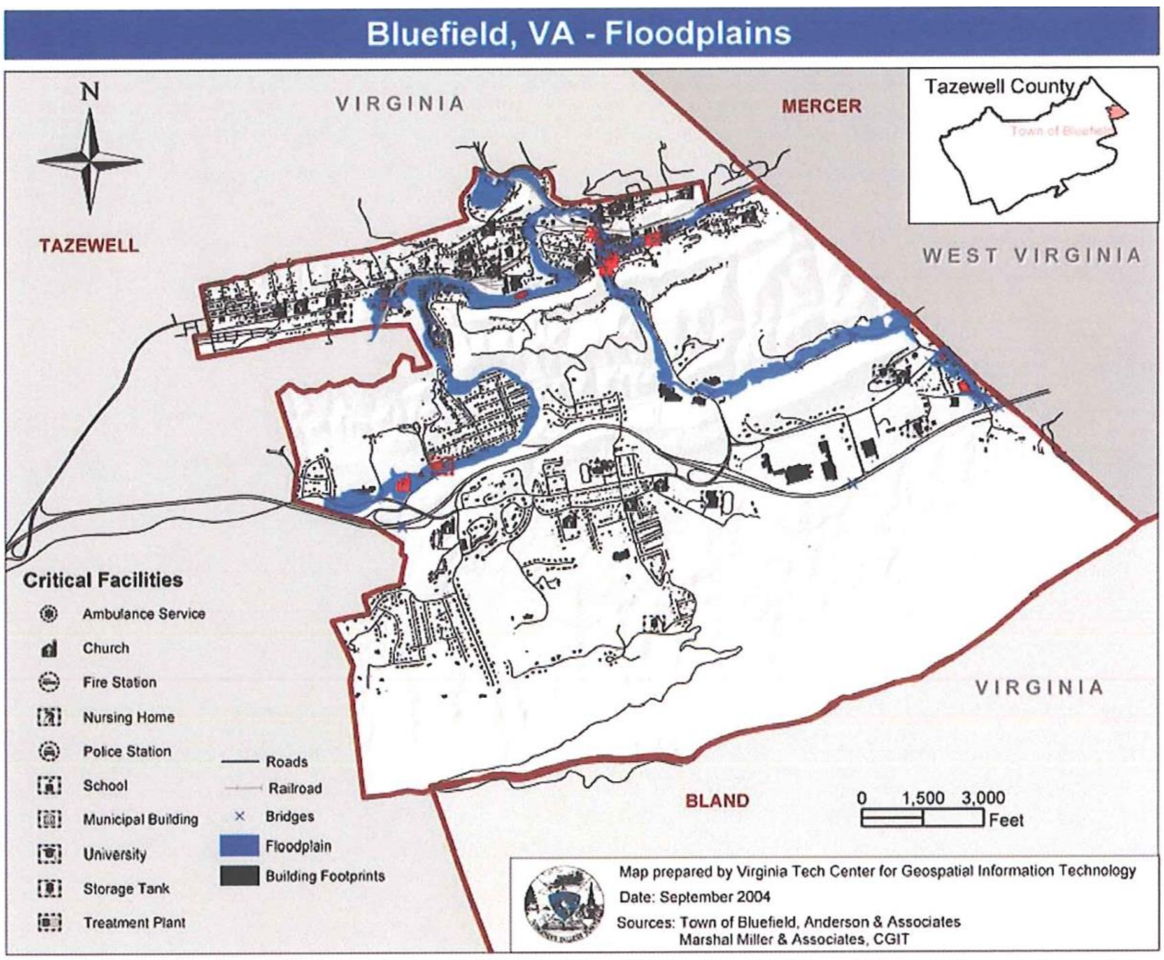


Figure B.5. Bluefield Structures and Critical Facilities in the Floodplain (shown in red).

Table B.4. Bluefield Structure Flood Risk Totals.

Infrastructure	FLOODPLAIN	NOT IN FLOODPLAIN	FEMA & TOWN BUY OUTS
Church	4	23	0
Fire Station	0	1	0
Nursing Home	0	1	0
Police	0	1	0
School	0	13	0
Municipal Building (Temporary)	0	1	0
University	0	23	0
Water Storage Tank	0	1	0
Water Treatment Plant	1	1	0
Non-Critical Infrastructure	304	2,854	11
GRAND TOTAL	**309**	2,919	**11**
% Structures in Risk Areas	10%	90.12%	0.34%

Table B.5. Bluefield Structure Flood Risk Values.

Infrastructure	Value in the Floodplain	Sum of Building Value not in the Floodplain	Sum of Building Total Value
Church	$2,223,700	$9,689,027	$11,912,727
Fire Station	$0	$35,400	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$0	$75,600	$75,600
School	$0	$18,706,688	$18,706,688
Municipal Building (Temporary)	$0	$75,600	$75,600
University	$0	$185,299,500	$185,299,500
Water Storage Tank	$0	$77,057	$77,057
Water Treatment Plant	$2,175,000	$75,600	$2,250,600
Non-Critical Infrastructure	$35,697,100	$289,228,246	$324,925,346
GRAND TOTAL	**$40,095,800**	**$503,338,318**	**$543,434,118**
% BUILDING VALUE	7.38%	92.62%	

Table B.6. Known Critical Facilities in the Floodplain.

Facility Type	Location	Building Value
BAPTIST CHURCH / BURNED	401 VIRGINIA AVE	$882,400
PARKVIEW BAPTIST CHURCH	CHURCH HOCKMAN PIKE	$631,000
FIRST UNITED METHODIST CHURCH	200 S COLLEGE AVE	$528,300
GRAHAM PRESBYTERIAN CHURCH	140 S COLLEGE AVE	$182,000
TOWN WATER PLANT	104 PARKVIEW DR	$2,175,000
	TOTAL BUILDING VALUES	$4,398,700

Section 4 - Winter Storms

Hazard History

Table B.7. Bluefield Snowfall Totals (Source: Bluefield Daily Telegraph).

Date	Recorded Snowfall (inches)
December 11, 1944	27.5
February 19-27, 1947	35.75
November 24-26, 1950	19
March 12-14, 1993	25
January 6-8, 1996	23.6
January 28, 1998	24.7

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete winter storm hazard profile.

Hazard Areas

No additional information for the Town of Bluefield, see CPPDC plan.

Vulnerability Analysis

No additional information for the Town of Bluefield, see CPPDC plan.

Secondary effects

Winter storms are an annual occurrence for the Town of Bluefield. Secondary hazards, such as snowmelts causing flooding, are a concern to the town. Flooding is addressed, in detail, in the flooding section of this report and the CPPDC plan.

Section 5 - Wildfire

Hazard History

Refer to the Cumberland Plateau Planning District Commission for the complete wildfire hazard history.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete wildfire hazard profile.

Hazard Areas

The Town of Bluefield has two distinct wildfire areas. Figure B.6. illustrates the fire zones for the Town of Bluefield. The town is dominated by the high risk zone for wildfires. Refer to the Cumberland Plateau Planning District Commission for the complete description of the wildfire hazard areas.

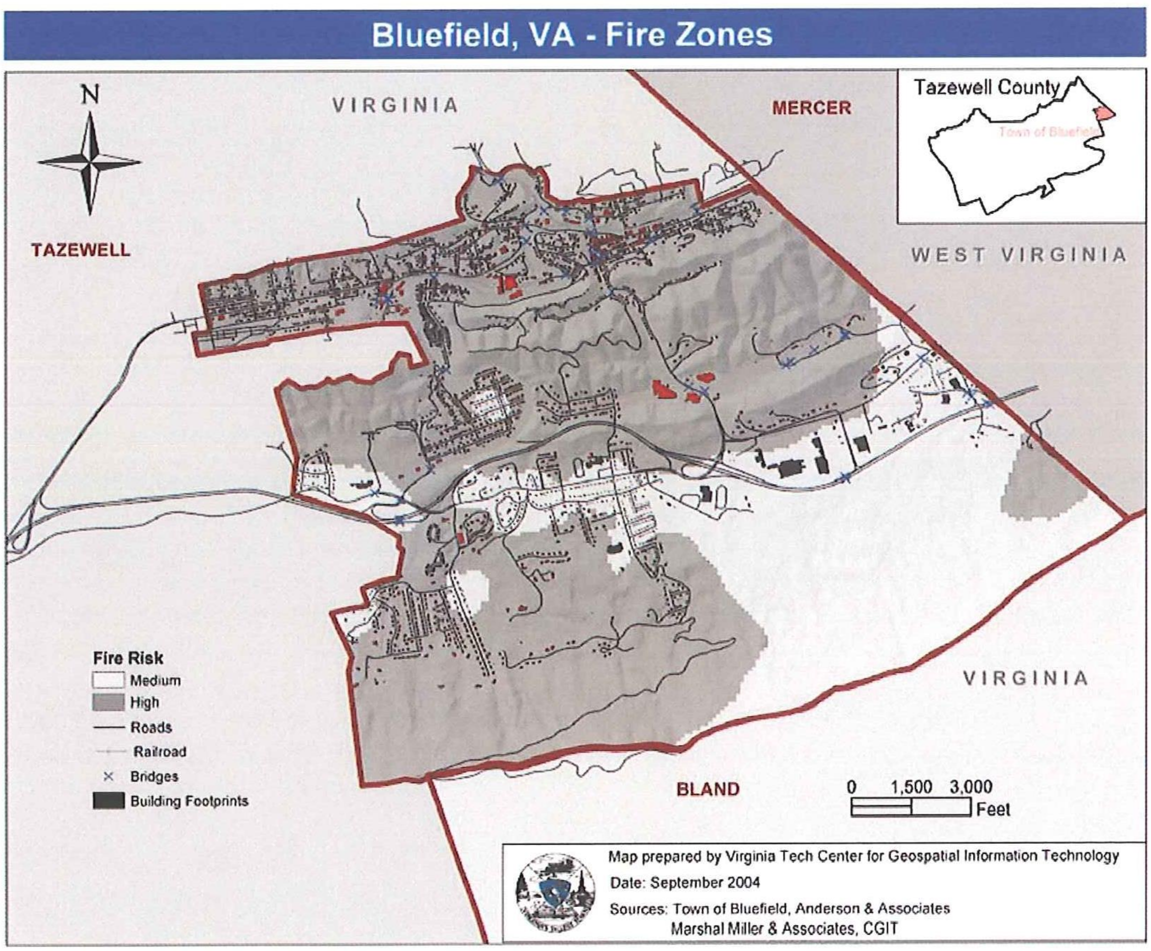


Figure B.6. Bluefield Fire Hazard Zones (based on Virginia Department of Forestry Fire Hazard Mapping with structures in high zone in red).

Vulnerability Analysis

All of the homes and businesses in the Town of Bluefield are in a Medium or High risk area for wildfires. Approximately 83% of the buildings in Bluefield are in a high risk area for wildfires, accounting for 61% of the building value for the town. Figure B.7. shows the location of critical facilities to wildfire risk areas. Most of the critical facilities are located in the high risk areas. The totals and values for these structures and critical facilities are listed in Tables B.8. and B.9.

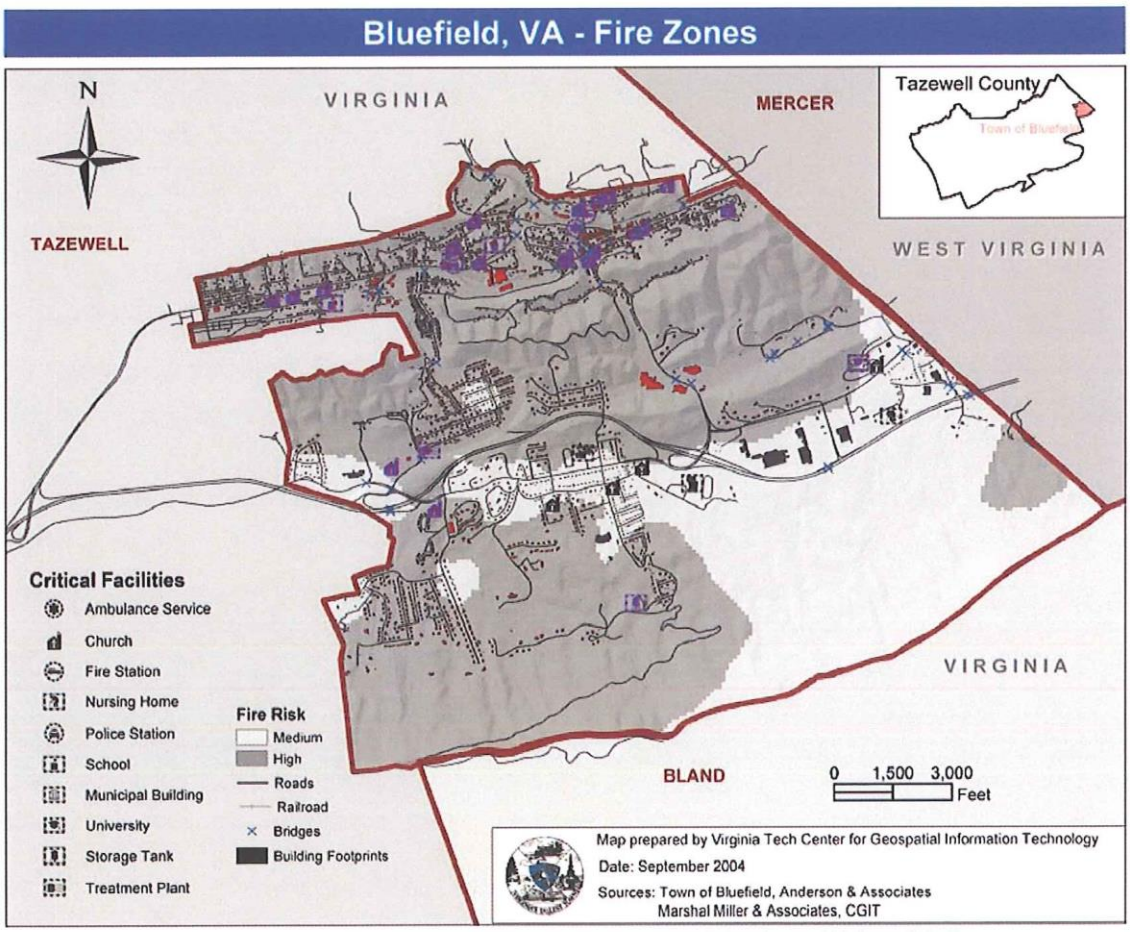


Figure B.7. Bluefield Fire Hazards for Structures and Critical Facilities (high zone structures shown in red, critical facilities in purple).

Table B.8. Bluefield Structure Fire Risk Totals.

Infrastructure	FIRE GRID CODE 1 - LOW	2 - MEDIUM	3 - HIGH
Church	0	4	23
Fire Station	0	0	1
Nursing Home	0	1	0
Police	0	0	1
School	0	3	10
Municipal Building *(Temporary)*	0	0	1
University	0	18	5
Water Storage Tank	0	0	1
Water Treatment Plant	0	0	2
Non-Critical Infrastructure	0	530	2,639
GRAND TOTAL	0	**556**	**2,683**
% Structures in Risk Areas	0%	17.17%	82.83%

Table B.9. Bluefield Structure Fire Risk Values.

Infrastructure	TOTAL BUILDING VALUES IN FIRE RISK ZONES 1 - LOW	2 - MEDIUM	3 - HIGH	TOTAL VALUE
Church	0	$8,493,712	$3,419,015	$11,912,727
Fire Station	0	$0	$35,400	$35,400
Nursing Home	0	$75,600	$0	$75,600
Police	0	$0	$75,600	$75,600
School	0	$4,660,000	$14,046,688	$18,706,688
Municipal Building (Temporary)	0	$0	$75,600	$75,600
University	0	$145,017,000	$40,282,500	$185,299,500
Water Storage Tank	0	$0	$77,057	$77,057
Water Treatment Plant	0	$0	$2,250,600	$2,250,600
Non-Critical Infrastructure	0	$56,188,565	$268,736,781	$324,925,346
GRAND TOTAL	**0**	**$214,434,877**	**$328,999,241**	**$543,434,118**
% BUILDING VALUE	0%	39.46%	60.54%	

Section 6 - Landslides and Karst

Note: Bluefield had available information about karst areas and sinkholes that was not included in the CPPDC Plan. This section will provide background information on karst not included in the CPPDC Plan.

Hazard History

Refer to the Cumberland Plateau Planning District Commission for the complete landslide hazard history.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete landslide hazard profile.

Land subsidence is the lowering of surface elevations due to changes made underground. The USGS notes that land subsidence is usually caused by human activity such as pumping of water, oil, or gas from underground reservoirs. Land subsidence often occurs in regions with mildly acidic groundwater and the geology is dominated by limestone, dolostone, marble or gypsum. Karst is the term used to refer to geology dominated by limestone and similar soluble rocks. The acidic groundwater dissolves the surrounding geology creating sinkholes. Sinkholes are classified as natural depressions of the land surface. Areas with large amounts of karst are characterized by the presence of sinkholes, sinking streams, springs, caves and solution valleys.

Marshall Miller and Associates, a local consulting firm, provided data for analysis.

Impacts

The USGS recognizes four major impacts caused by land subsidence:

1. changes in elevation and slope of streams, canals, and drains
2. damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, and levees
3. damage to private and public buildings
4. failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems

Predictability

Refer to the Cumberland Plateau Planning District Commission for the complete landslide predictability.

The most important current and future environmental issue with respect to karst is the sensitivity of karst aquifers to groundwater contamination. The effect of man on karst is most severe in cases where polluted surface waters enter karst aquifers. This problem is universal among all karst regions in the United States that underlie populated areas. The country's karstic groundwater problems are accelerated with the advent of (1) expanding urbanization, (2) misuse and improper disposal of environmentally hazardous chemicals, (3) shortage of suitable repositories for toxic waste (both household and industrial), and (4) ineffective public education on waste disposal and the sensitivity of the karstic groundwater system.

Occasionally the land surface in karst regions may collapse. Most of these events are triggered by man's activities in the karstic environment. Excessive pumping of groundwater from karstic aquifers may rapidly lower the water table and calls a sudden loss of buoyant forces that stabilize the roofs of cavernous openings. Man-induced changes in surface water flow and infiltration also may cause collapse. Most sinkholes that form suddenly occur where soil that overlies bedrock collapses into the pre-existing void.

Hazard Areas

The following maps provide information about the locations and severity of landslide and land subsidence from karst risks in Bluefield. Figure B.8. shows the USGS landslide zones in Bluefield from nationwide landslide mapping. Notice most of the town is either in the "Moderate Susceptibility/Low Incidence" category or the "Low Incidence" category. While these categories take into account national geologic mapping and national databases of landslide occurrence, these do not have the resolution for detailed, local slopes.

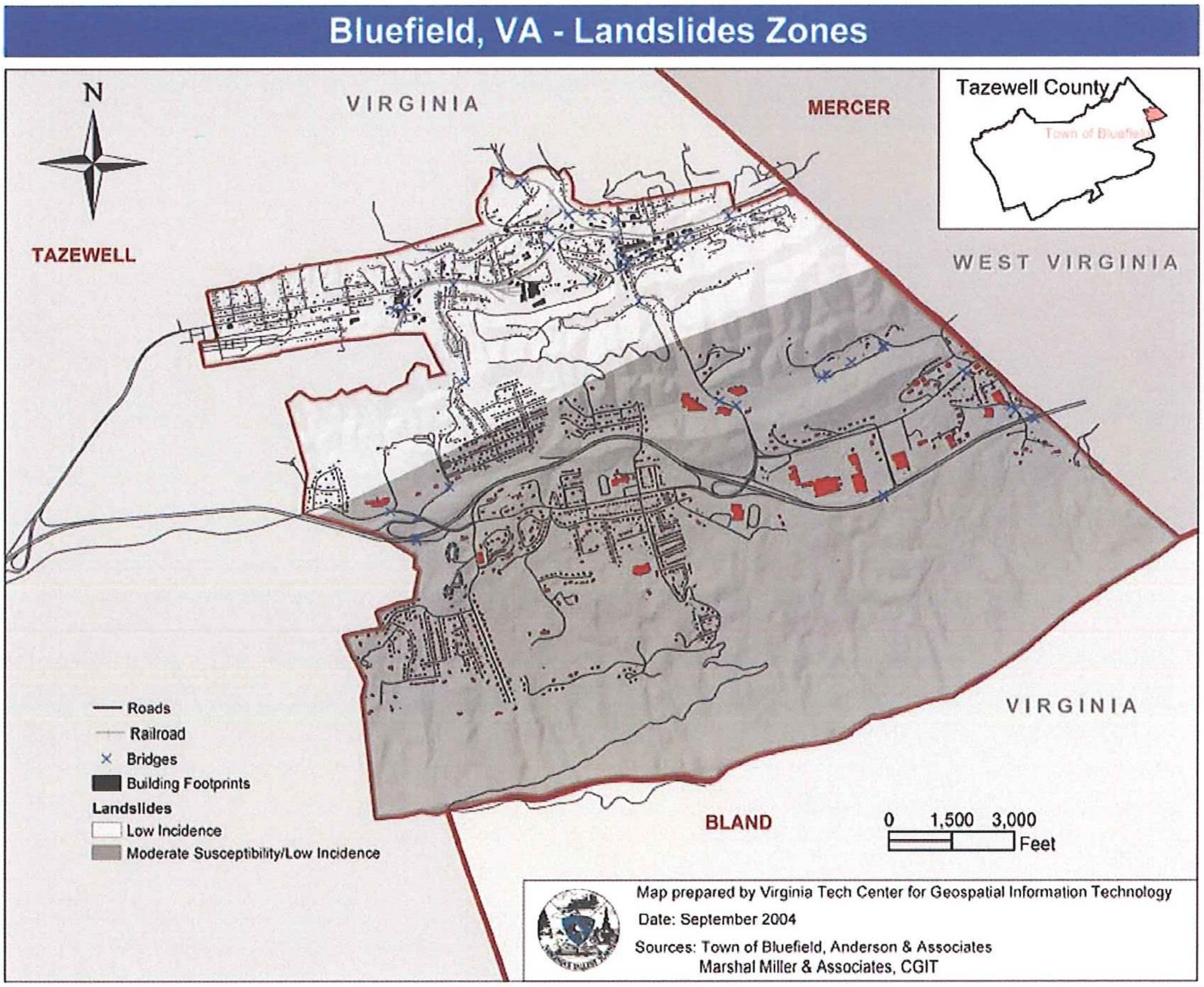


Figure B.8. Bluefield Landslide Zones (from USGS National Landslide Map, moderate susceptibility/low incidence structures shown in red).

Figure B. 9. shows three ranges of percent slope (0-15%, 15-30%, and 30%+) within Bluefield based off of 2002 LIDAR elevation data developed by Tuck Engineering.. The area with the highest slopes (30%) are expected to have the greatest landslide potential. These is especially true in location like road cuts along Rt. 460, where slopes approach 1

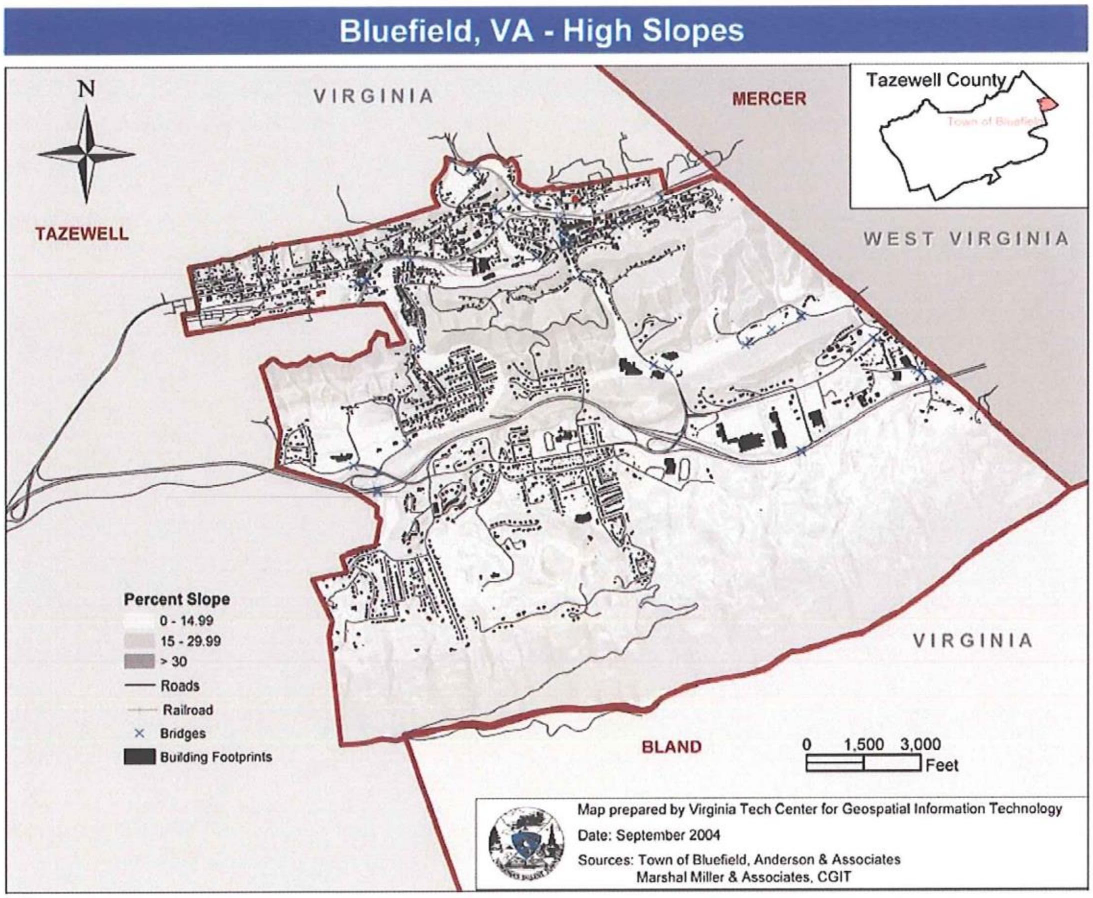


Figure B.9. Bluefield High Slopes (Source: 2002 LIDAR elevation data).

Figure B. 10. shows another way that the 2002 LIDAR elevation data can be interpreted to develop a sinkhole map for Bluefield. The areas with a substantial elevation depression that were not part of the regular drainage network were classified sinkholes. Notice most of the sinkhole are along the base of East River Mountain, south of Rt. 460. developed by Tuck Engineering.. The area with the highest slopes (30%) are expected to have the greatest landslide potential. These is especially true in location like road cuts along Rt. 460, where slopes approach 100%.

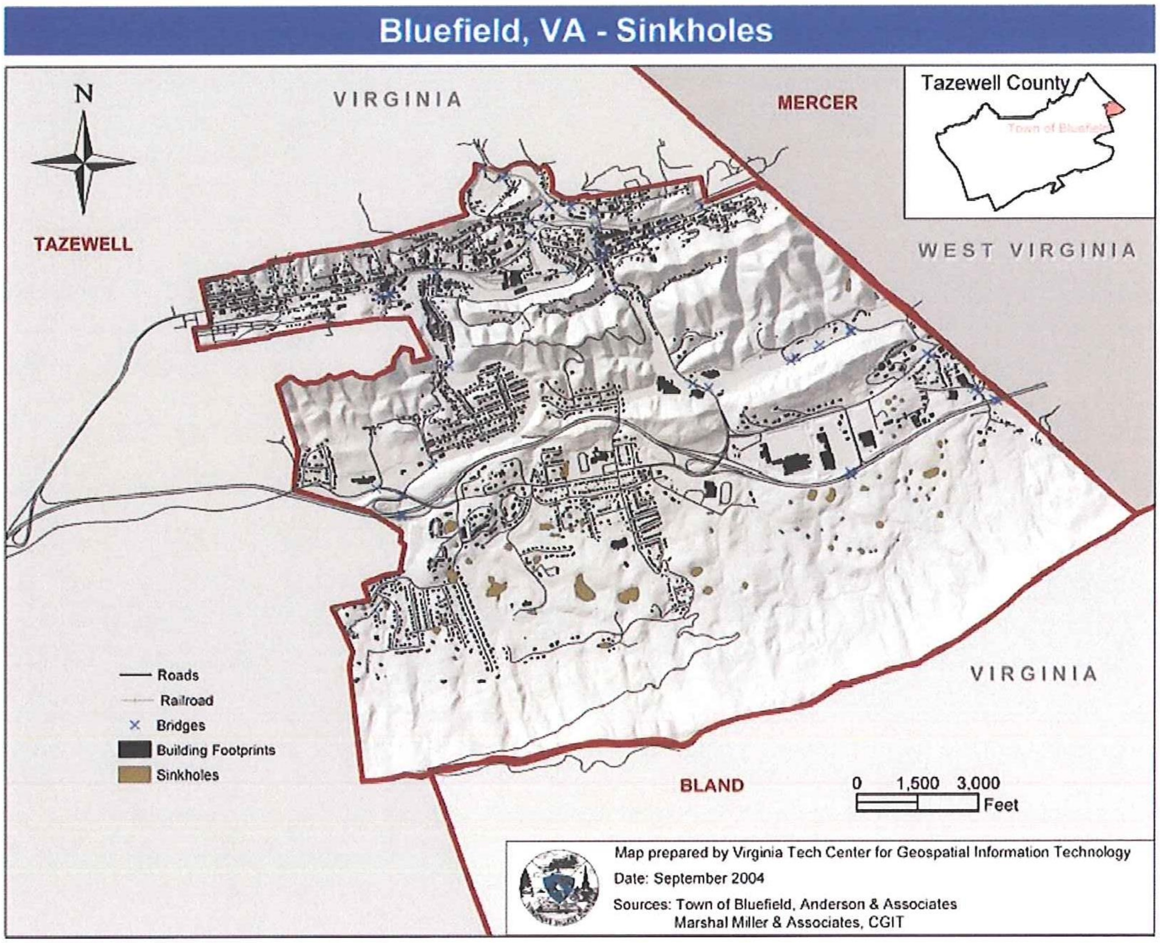
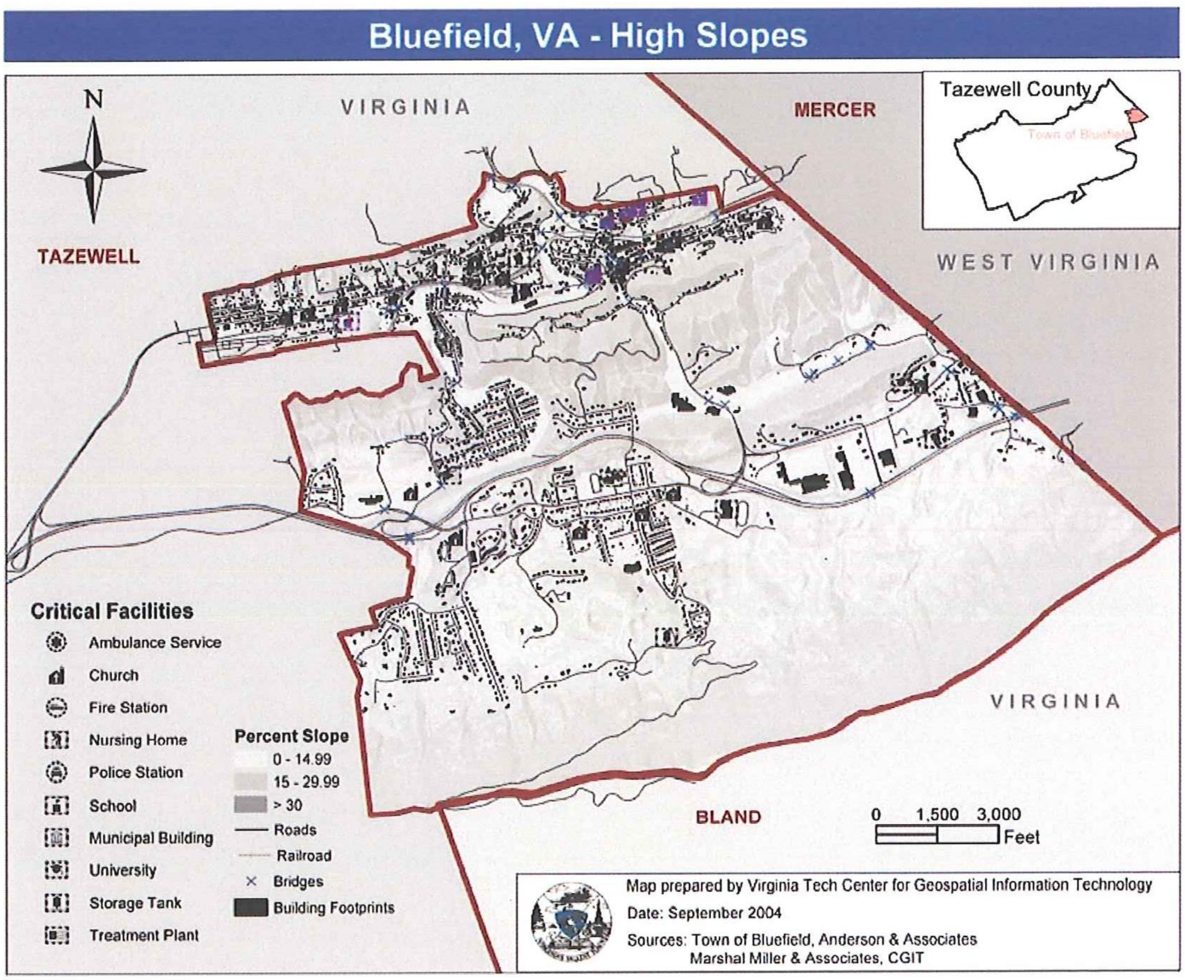


Figure B.10. Bluefield Sinkholes (Source: 2002 LIDAR elevation data).

Vulnerability Assessment

Landslides and karst topography are a medium risk to the residents and business owners in the Town of Bluefield. Structures that are built in an area of greater than 15% slope account for 31% of the total building value for structures in the Town of Bluefield, which can also be represented as 29% of the total buildings, as shown in Figure B. 11 and listed in Tables B.10 and B.1 1. Compared to landslide risk, risk from a building failure due to karst topography is rather small, with 0.37% of structures within 30 feet of known sinkholes, as shown in Figure B.12 in Tables B.12 and B.13. Developing in a karst landscape may pose significant problems without ordinances to limit development in high risk areas.



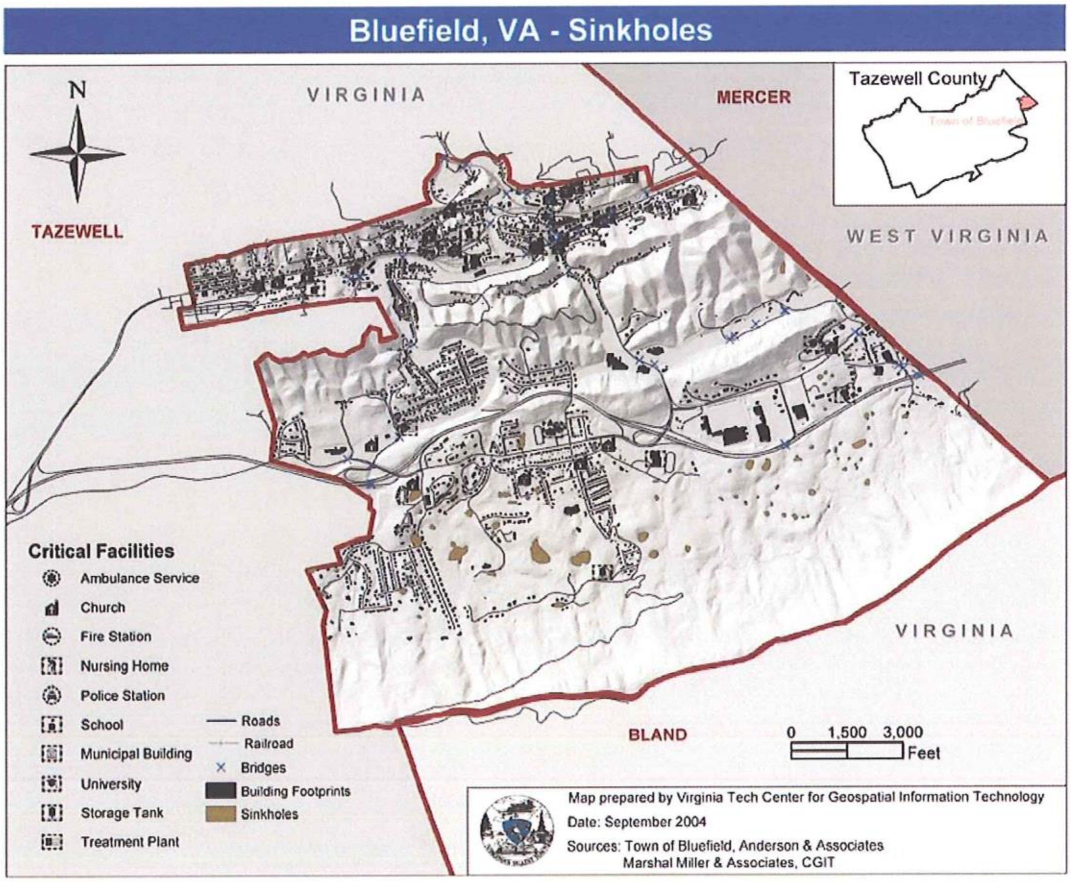
B. 11. Bluefield High Slope Hazards for Structures and Critical Facilities (Structures in >30% slope shown in red, critical facilities in purple).

Table B. 10. Bluefield Structure High Slope Risk Totals.

Infrastructure	TOTAL BUILDINGS COMPARED TO SLOPE Greater than slope	Less than 15% slope	BUILDING 15% TOTAL
Church	9	18	27
Fire Station	0	1	1
Nursing Home	0	1	1
Police	0	1	1
School	3	10	13
Municipal Building	0	1	1
University	10	13	23
Water Storage Tank	0	1	1
Water Treatment Plant	0	2	2
Non-Critical Infrastructure	926	2243	3169
GRAND TOTAL	**948**	**2291**	**3239**
% Structures in Risk Areas	29.27%	70.73%	

Table B. 11. Bluefield Structure High Slope Risk Values.

Infrastructure	TOTAL BUILDING VALUES COMPARED TO SLOPE Greater than slope	Less than 15% slope	TOTAL 15%
Church	$1,046,388	$10,866,339	$11,912,727
Fire Station	$0	$35,400	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$0	$75,600	$75,600
School	$2,434,488	$16,272,200	$18,706,688
Municipal Building	$0	$75,600	$75,600
University	$80,565,000	$104,734,500	$185,299,500
Water Storage Tank	$0	$77,057	$77,057
Water Treatment Plant	$0	$2,250,600	$2,250,600
Non-Critical Infrastructure	$85,113,797	$239,811,549	$324,925,346
GRAND TOTAL	$169,159,673	**$374,274,445**	**$543,434,118**
% Structures in Risk Areas	31.13%	68.87%	



B.12. Bluefield Sinkhole Hazards for Structures and Critical Facilities (shown in red).

Table B.12. Bluefield Structure Sinkhole Risk Totals.

	TOTAL BUILDINGS WITHIN 30 FEET OF SINKHOLES		
Infrastructure	**NO**	**YES**	**TOTAL BUILDINGS**
Church	27	0	27
Fire Station	1	0	1
Nursing Home	1	0	1
Police	1	0	1
School	13	0	13
Municipal Building (Temporary)	1	0	1
University	23	0	23
Water Storage Tank	1	0	1
Water Treatment Plant	2	0	2
Non-Critical Infrastructure	3157	12	3169
GRAND TOTAL	**3227**	**12**	**3239**
% Structures in Risk Areas	99.63%	0.37%	

Table B.13. Bluefield Structure Sinkhole Risk Values.

	TOTAL BUILDING VALUE WITHIN 30 FEET OF SINKHOLES		
Infrastructure	NO	YES	**TOTAL VALUE**
Church	$11,912,727	$0	$11,912,727
Fire Station	$35,400	$0	$35,400
Nursing Home	$75,600	$0	$75,600
Police	$75,600	$0	$75,600
School	$18,706,688	$0	$18,706,688
Municipal Building (Temporary)	$75,600	$0	$75,600
University	$185,299,500	$0	$185,299,500
Water Storage Tank	$77,057	$0	$77,057
Water Treatment Plant	$2,250,600	$0	$2,250,600
Non-Critical Infrastructure	$323,657,204	$1,268,142	$324,925,346
GRAND TOTAL	**$542,165,976**	**$1,268,142**	**$543,434,118**
% Structures in Risk Areas	99.77%	0.23%	

Section 7 - Wind Events

Hazard History

Table B.14. Bluefield High Wind Events

	Damages
September 22, 1989	High winds (40mph) and rain from tropical storm Hugo resulted in power outages and uprooted trees.
September 4, 1993	Thunderstorms in southwest Virginia caused damage to homes and power lines. Property damages were estimated at $5 million (for Tazewell County).

There are no notable or recorded tornadoes for the Town of Bluefield.

Wind Zones

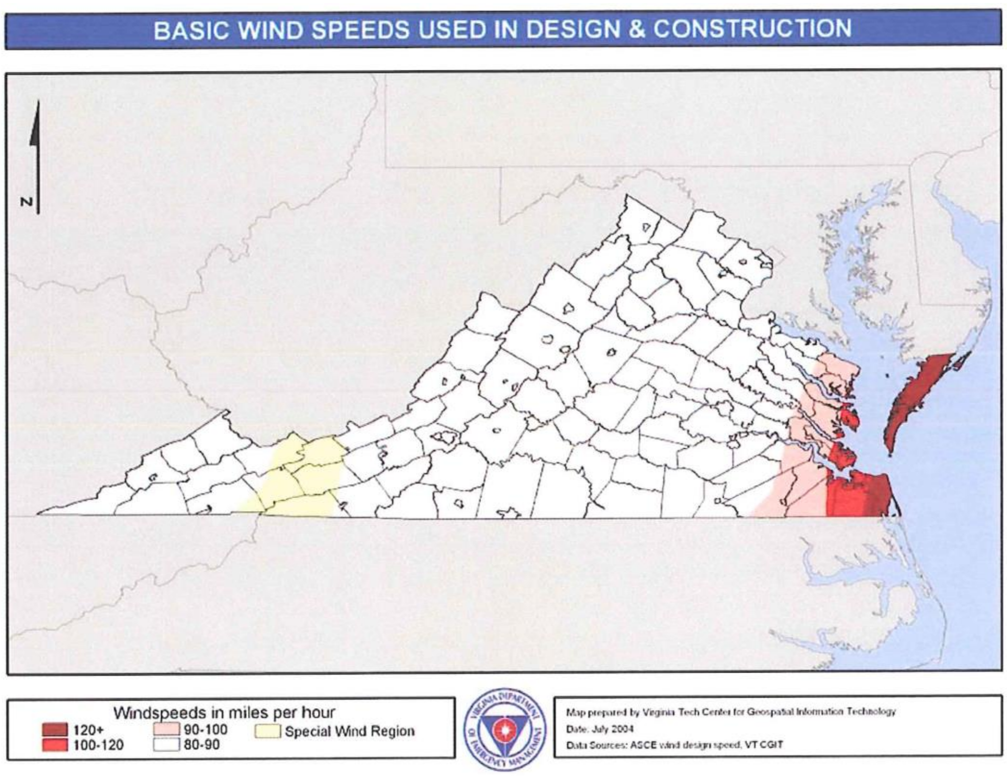


Figure B.13. 50-yr Design Wind Speeds for Virginia (from ASCE 7-98).

Figure B. 13. shows the basic design wind speed used for design and construction in Virginia. This map not only applies to windstorms, but also hurricane winds and tornado winds, as a basis for structural design based on potential wind loads. The Town of Bluefield is located in the "Special Wind Region" as a result of the mountainous terrain. In these regions, localities have the option of adopting more stringent wind load designs than the minimum national codes if local meteorological information supports this. Bluefield has not adopted any such wind design loads, so the 50-yr design wind speed is 80-90 mph.

Vulnerability Analysis

Refer to the Cumberland Plateau Planning District Commission for the complete wind event vulnerability analysis.

Design Wind Pressures

Refer to the Cumberland Plateau Planning District Commission for the complete wind event design wind pressures.

Building Types

Refer to the Cumberland Plateau Planning District Commission for the complete wind event building types.

Critical Facilities

Refer to the Cumberland Plateau Planning District Commission for the complete wind event critical facilities.

Estimating Losses

Refer to the Cumberland Plateau Planning District Commission for the complete wind event estimating losses.

Section 8 - Earthquakes

Hazard History

Table B.15. Bluefield Earthquake Events.

Date	Magnitude	Comments
March 9, 1828		Centered in Southwestern Virginia. Felt from Pennsylvania to South Carolina
May 31, 1897	Magnitude 5.8 Mfa NUT	Damages to houses in Bluefield West Virginia. Earthquake centered in Giles County, Virginia. Bluefield, West Virginia was about 40 km from the epicenter
May 3, 1897	Magnitude 4.3 Mfa NUT	Centered in Southwestern Virginia

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete earthquake profile.

Hazard Areas

There are a few fault lines that run through the center of the Town of Bluefield. Marshall Miller and Associates, a local consulting firm, provided data for analysis, as shown in Figure B. 14.

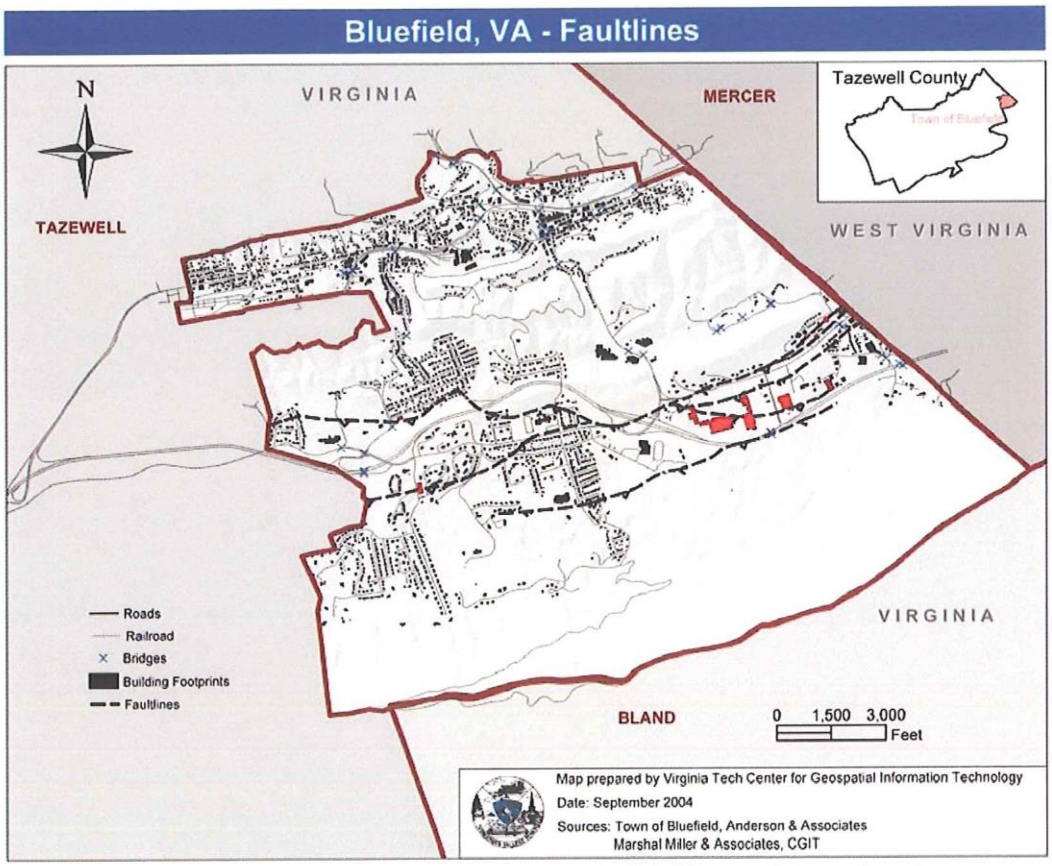
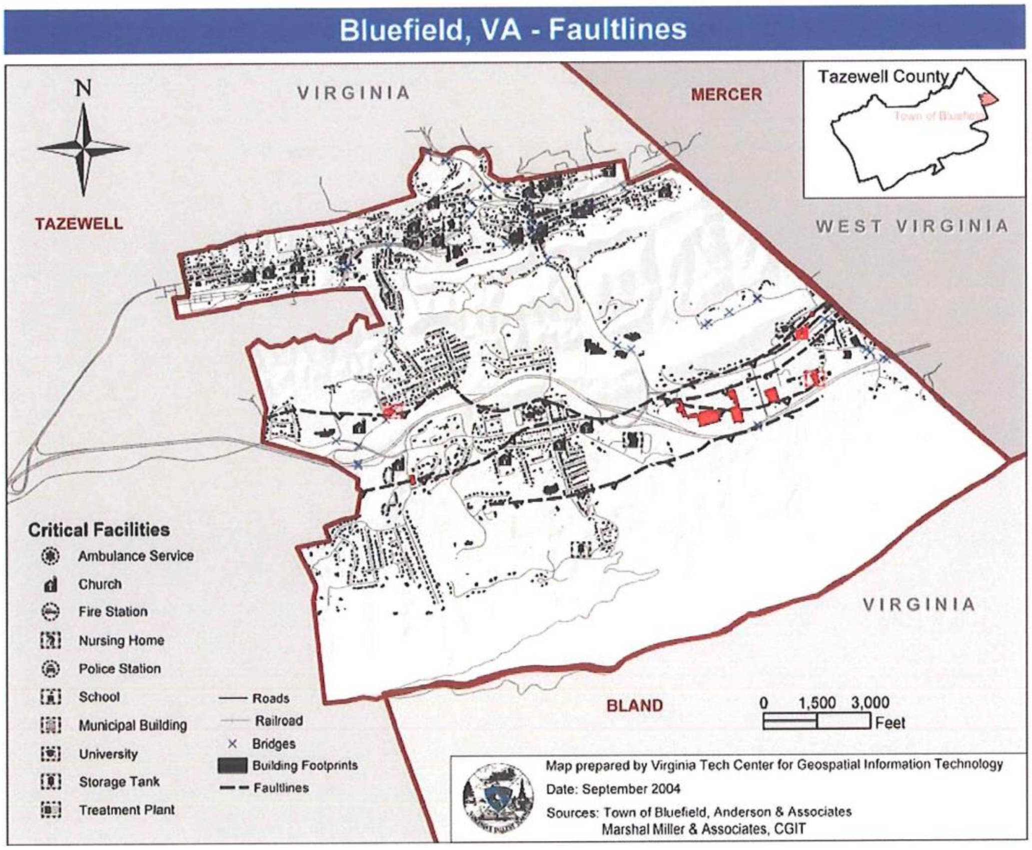


Figure B.14. Bluefield Fault Lines (Source: Marshall Miller and Associates).

Vulnerability Analysis

Figure B. 15. shows those structures and critical infrastructure that are located with 30 feet of these faults. Tables B.16. and B.17. detail the totals and values of these at-risk locations.



B. 15. Bluefield Fault Line Hazards for Structures and Critical Facilities (shown in red).

Table B.16. Bluefield Structure Fault Line Risk Totals.

	TOTAL BUILDINGS WITHIN 30 FEET OF FAULT LINES		
Infrastructure	**NO**	**YES**	**TOTAL BUILDINGS**
Church	26	1	27
Fire Station	1	0	1
Nursing Home	0	1	1
Police	1	0	1
School	13	0	13
Municipal Building (Temporary)	1	0	1
University	17	6	23
Water Storage Tank	1	0	1
Water Treatment Plant	1	1	2
Non-Critical Infrastructure	3095	74	3169
GRAND TOTAL	**3156**	**83**	**3239**
% Structures in Risk Areas	97.44%	2.56%	

Table B.17. Bluefield Structure Fault Line Risk Values.

	TOTAL BUILDING VALUE WITHIN 30 FEET OF FAULT LINES		
Infrastructure	NO	YES	**TOTAL VALUE**
Church	$3,856,227	$8,056,500	$11,912,727
Fire Station	$35,400	$0	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$75,600	$0	$75,600
School	18706688	$0	$18,706,688
Municipal Building (Temporary)	$75,600	$0	$75,600
University	$136,960,500	$48,339,000	$185,299,500
Water Storage Tank	$77,057	$0	$77,057
Water Treatment Plant	$75,600	$2,175,000	$2,250,600
Non-Critical Infrastructure	$317,034,397	$7,890,949	$324,925,346
GRAND TOTAL	**$476,897,069**	**$66,537,049**	**$543,434,118**
% Structures in Risk Areas	87.76%	12.24%	

Section 9 - Drought

Hazard History

Table B.18. Recent Bluefield Droughts.

	Damages
1995	A drought, which started earlier in the summer, peaked in many sections of southwest, south- central and west-central Virginia during the first two weeks of September. The drought damaged crops and resulted in many lakes and rivers being well below normal levels. Governor George Allen declared a state of emergency for southwest, south-central and west-central Virginia because of the drought. Widespread significant rainfall on September 17 helped to alleviate the dry conditions.
1998 & 1999	Dry conditions started in July, subsided in August, started again in September, and continued through most of November. In most areas, crops were damaged or destroyed. Water levels in creeks, streams, rivers, and lakes were fairly low. Water levels in some shallow wells were low. Crop damages were estimated over $7.7 million. The drought ended in most areas with the arrival of heavy rain from the remnants of hurricane Dennis on the 4th and 5th of September.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete drought profile.

Vulnerability Analysis

Impacts from droughts in the Town of Bluefield are a major concern. Most of the town's water supply comes from surface water (or wells supplied by surface water) and as a result, droughts can be detrimental to the town in respect to the societal demands placed on the water resources. Most of Bluefield is serviced by the Town's water systems, with the treatment located on the Bluestone River. Some areas of town are supplied by a company in West Virginia, specifically the commercial strip along College Avenue. Small portions of town have their own water supply (i.e. well systems). The current Bluefield water system is near capacity and plans are already in place to expand the system throughout town. While there are connections to neighboring water systems, during a severe drought the Town would likely have some water supply issues.

Mitigation Strategy

The Town of Bluefield has been involved with the district mitigation planning efforts of the Cumberland Plateau Planning District Commission. The Bluefield Zoning Administrator (Derrick Ruble from 2002-2003 and Edward Moore from 2003-2004) have attended meetings with the Mitigation Advisory Committee and conveyed this information to the Bluefield Town Council (current members listed in Table B. 19).

Table B.19. 2004 Bluefield Town Council and Town Manager

Members	Position/Office
Donald Harris	Mayor
Rick Taylor	Vice Mayor
Tom Chaffins	Council member
Brent Chambers	Council member
Ed Shaffrey	Council member
Anglis Trigg Jr.	Council member
Todd Day	Town Manager

Bluefield Town Council decided for their mitigation strategy to use the same goals and objectives as the CPPDC Plan, and developed detailed implementation details for items specifically within Bluefield.

Goals, Objectives and Implementation

The Cumberland Plateau Planning District Commission's overarching Goal, as well as the individual goals, is listed below in Table B.20. These goals were reviewed by the planning district's Mitigation Advisory Committee. The committee evaluated the strengths and weaknesses of the planning district in terms of hazard mitigation.

Table B.20. Bluefield Mitigation Goals (from CPPDC Plan).

Overarching Planning District Goal: *"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events. "*
Goal 1:
Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.
Goal 2:
Protect new and existing public and private infrastructure and critical facilities from the effects of hazards.
Goal 3:
Increase the Planning District communities floodplain management activities and participation in the National Flood Insurance Program.
Goal 4:
Ensure hazard awareness and risk reduction principles are institutionalized into the Planning District communities' daily activities, processes, and functions by incorporating it into policy documents and initiatives.
Goal 5:
Enhance community-wide understanding and awareness of community hazards.
Goal 6:
Publicize mitigation activities to reduce the area's vulnerability to hazards.

The CPPDC Plan takes these goals and identifies 13 actions for jurisdictions. Table B.21 lists the 8 actions that apply to the Town of Bluefield and the CPPDC priority for each of the actions. The tables also include the Town's priority (High, Moderate, Low) for each implementation action. The Town specific priorities were developed by Town staff based on the current Town goals of focusing on flooding and stormwater issues. The Town will work closely with Tazewell County and CPPDC staff on pursuing funding, implementing, and maintaining of both Town and Regional strategies. Bluefield plans to continue to actively participate in the CPPDC MAC. Due to funding and staff limitations with the Town, all future maintenance of the Bluefield portions of the Plan will stay with the CPPDC.

Table B.21. CPPDC Actions that Apply to Bluefield

Action	CPPDC Priority	Bluefield Priority	Comments
#1. Obtain official recognition of the Mitigation Advisory Committee by the Planning District's communities in order to help institutionalize and develop an ongoing mitigation program.	High	High	Due to funding and staff limitations with the Town, all future maintenance of the Bluefield portions of this Plan will stay with the CPPDC.
#2. Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the Planning District for potential mitigation projects.	High	High	Most repetitively flooded properties in Bluefield not on FEMA Property List.
#3. Undertake educational outreach activities by developing and distributing brochures and education materials for FEMA's Repetitive Loss Properties with specific mitigation measures emphasizing acquisition, relocation and elevation.	High	Moderate	Bluefield will look to CPPDC for lead role on this action.
#4. Publicize the Virginia Department of Forestry' s *Money for Mitigation Program.* Utilize existing wildfire maps to prioritize project areas in the Planning District. Assist local residents, in priority areas, to reduce wildfire hazards through the use of funding from the *Money for Mitigation Program.*	High	Low	Small portion of Bluefield residents will qualify for this program.
#5. Develop a comprehensive compilation of landslide activity in the Planning District to be used as a planning tool for future infrastructure projects.	High	Low	Town will look to VDOT and CPPDC for lead roles for this action.
#6. Evaluate the Planning District's community floodplain ordinances and enforcement procedures that may be outdated for possible upgrades.	Moderate	Moderate	Town will update ordinances when new FEMA floodplains are adopted during next three years through FEMA Map Modernization Program.
#12. Investigate all critical facilities to evaluate their resistance to wind, fire, landslide and flood hazards. This study will examine all critical facilities within the Planning District communities and make recommendations as to ways in which the facilities can be strengthened or hardened.	Moderate	Moderate	Town will actively assist Tazewell County and CPPDC efforts for this action.
#13. Support Public Works initiatives to improve stormwater infrastructure throughout the area.	Moderate	High	Town is currently conducting stormwater master plan study.

Sources

American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures,* ASCE 7- 98. 1998. Public Ballot Copy, American Society of Civil Engineers. Reston, VA.

Bluefield, West Virginia. Bluefield Daily Telegraph . P.O. Box 1599, Bluefield West Virginia, 24701. Article Dates: 5/7/1971; 4/5/1977; 9/22/1989; 9/23/1989; 3/21/2002; 2/16/2003; 2/20/2003; 2/23/2003; 2/25/2003; 11/20/2003; 11/21/2003; 12/4/2003; 6/13/2004 - 6/17/2004; 9/13/2004.

Drought Monitor. 2004. *Drought Monitor*, « http://drought.unl.edu/dm/archive/99/classify.htm> (8/20/2004).

Encyclopedia Britannica Online." Bluefield." Encyclopedia Britannica. 2004. <http://search.eb.com/eb/article?eu=15985>. (9/7/04).

Federal Emergency Management Agency (FEMA). 2003a. "The FEMA Map Store", *Federal Emergency Management Agency, Department of Homeland Security,* <http://store.msc.fema.gov/> (9/1/2004).

Mercer County Historical Society. Mercer County History: sesquicentennial year 1987: Mercer County VA March 17, 1837 to June 20, 1863; Mercer County W.Va. June 20, 1863. Princeton, W.Va 1991.

McGehee, Stuart, C.. Bluefield West Virginia, 1889-1989: a centennial history. Bluefield W.Va: Bluefield Centennial Commission. 1990.

Nation Master 2003-2004. "Bluefield, Virginia." <http://www.nationmaster.com/encyclopedia/Bluefield,-Virginia>. (9/7/04).

National Oceanic and Atmospheric Administration (NOAA) National Climatic Snow Center. 2002. "United States Snow Climatology", *National Oceanic and Atmospheric Administration National Climatic Snow Center*, <http://lwf.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html>, (9/7/2004).

National Oceanic and Atmospheric Administration (NOAA) National Weather Service Tropical Prediction Center: National Hurricane Center. 2004. "NHC/TPC Archive of Past Hurricane Seasons.", *National Weather Service Tropical Prediction Center: National Hurricane Center*, <http://www.nhc.noaa. gov/>, (9/19/2004).

Porter, H.C. Soil Survey, Tazewell County. Washington, U.S. Government. Print Off., 1948.

Stover, Carl W.., Coffman, Jerry L.. Seismicity of the United Sates 1568-1989 (Revised). United States Geological Survey (USGS). 1993. pp 376-378.

Southeast Regional Climate Center (SERCC). 2004. "Historical Climate Summaries for Virginia", *Southeast Regional Climate Center*, <http://www.dnr.state.sc.us/climate/sercc/climateinfo/historical/historical_va.html>, (9/5/2004).

Tazewell County, Virginia. "Town of Bluefield" <http://www.netscope.net/~tourtaz/home/> (9/7/04).

United States Geological Survey (USGS). "Earthquake History of West Virginia." <http://neic.usgs.gov/neis/states/west virginia/west Virginia history.html> (9/7/04).

United States Geological Survey (USGS). "Earthquake History of Virginia." <http://neic.gov/states/virginia/ virginia.html > (9/7/04).

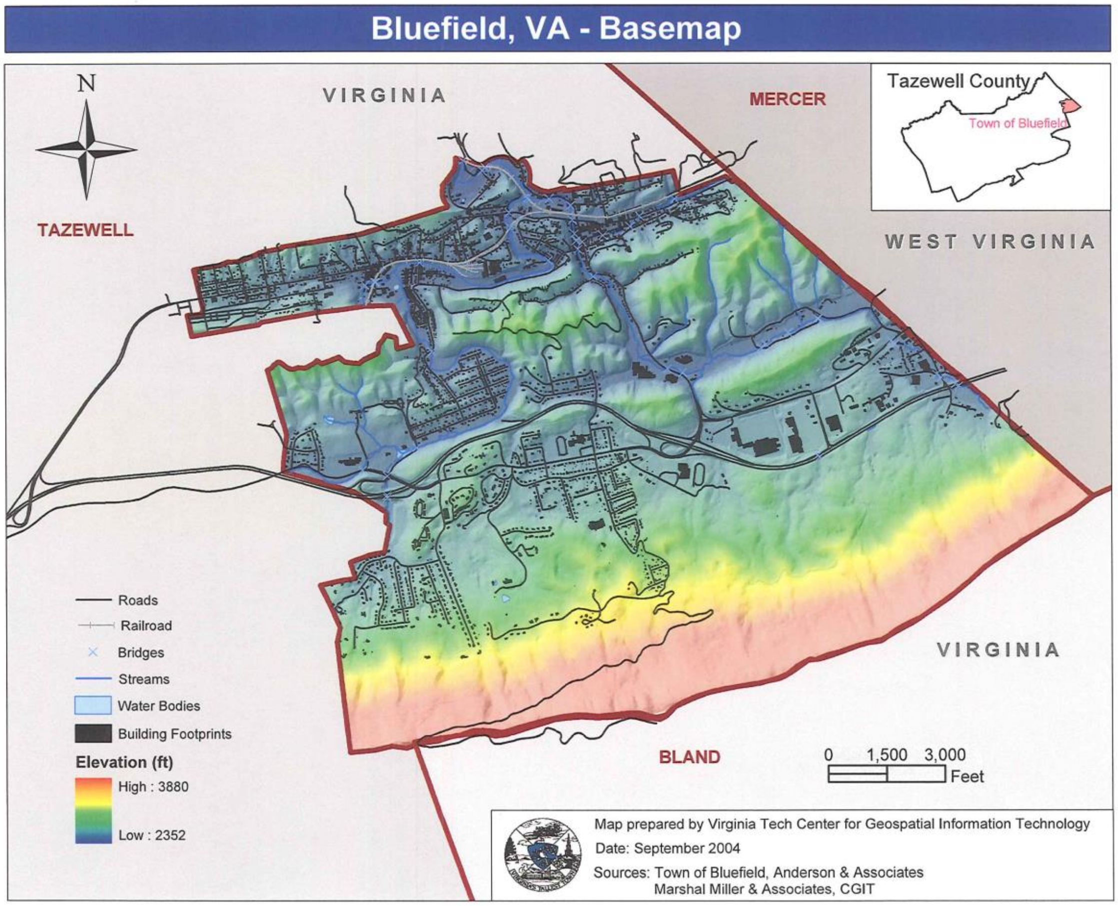
United States Geological Survey (USGS). 2002a. "Landslide Incidence and Susceptibility of the Conterminous United States", *United States Geological Survey, Department of the Interior*, <http://nationalatlas.gov/lsoverm.html> (9/18/2004).

United States Geological Survey (USGS). 2002b. "Principal Aquifers of the 48 Conterminous United States, Hawaii, Puerto Rico, and the U.S. Virgin Islands", *United States Geological Survey, Department of the Interior*, « http://nationalatlas.gov/atlasftp.html> (9/2/2004).

United States Geological Survey (USGS). 2003. "Earthquake Hazards Program", *United States Geological Survey, Department of the Interior*, <http://earthquake.usgs.gov/> (8/21/2004).

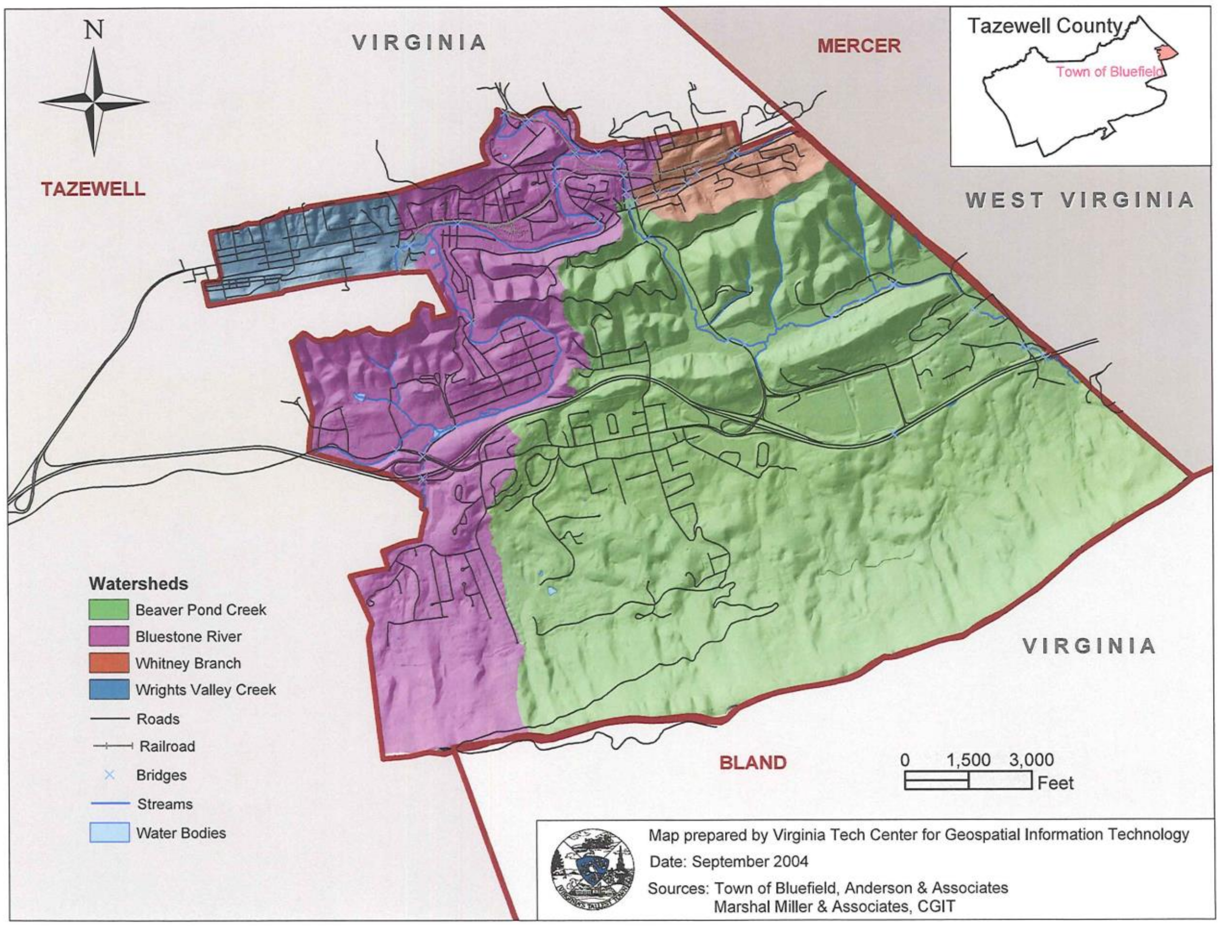
Virginia Department of Forestry (VDOF). 2004. "Wildfire Risk Analysis", *Virginia Department of Forestry*, <http: //www. vdof. or g/gi s/> (6/24/2004).

Virginia Tech. "Virginia's Largest Earthquakes." <http://www.geol.vt.edu/outreach/vtso/VA-Eq.html>. (8/25/04).

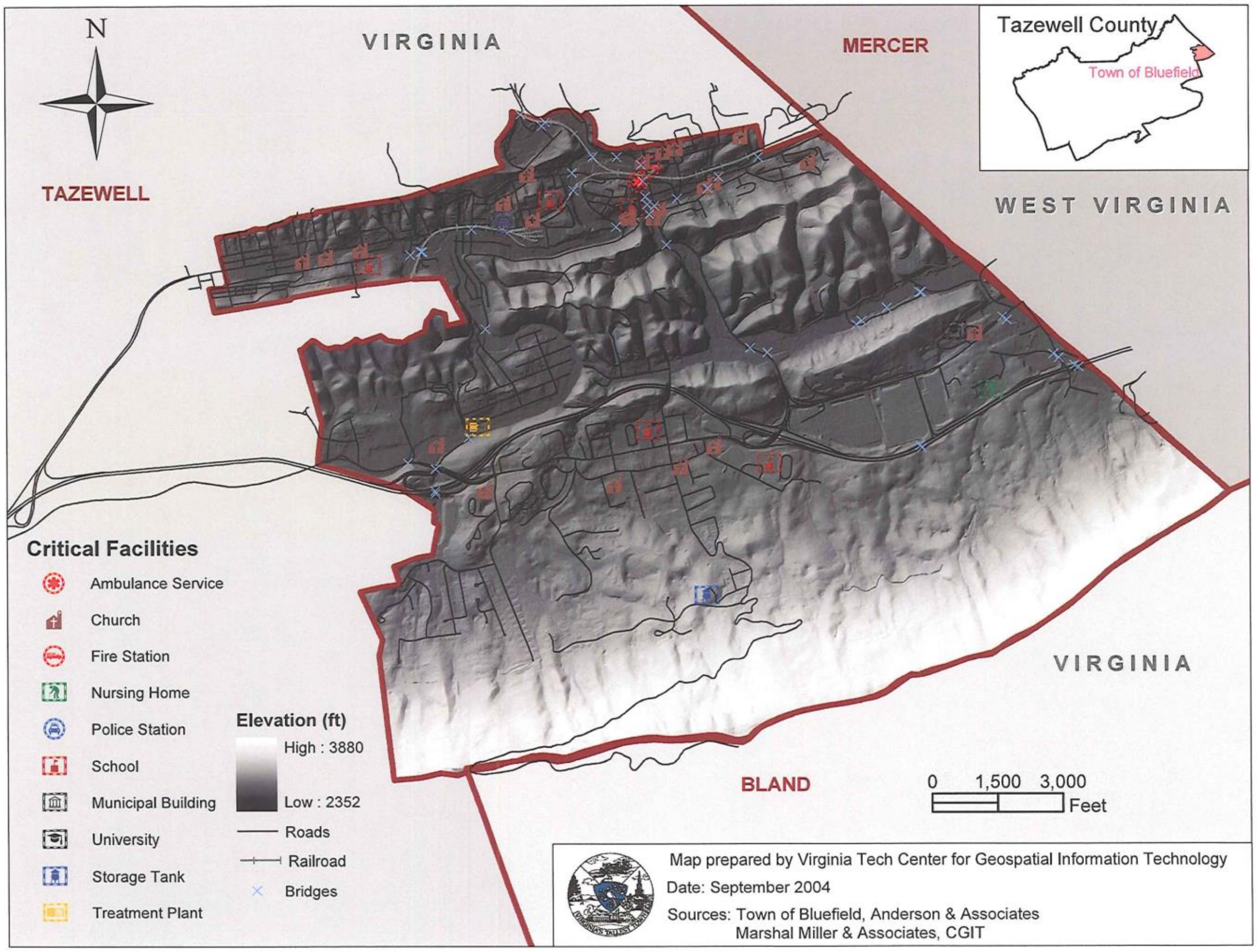


Bluefield, VA - Basemap
N
VIRGINIA
MERCER
Tazewell County
Town of Bluefield
TAZEWELL
WEST VIRGINIA
VIRGINIA
BLAND
Roads
Railroad
Bridges
Streams
Water Bodies
Building Footprints
Elevation (ft)
High : 3880
Low : 2352
0 1,500 3,000
Feet
Map prepared by Virginia Tech Center for Geospatial Information Technology
Date: September 2004
Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

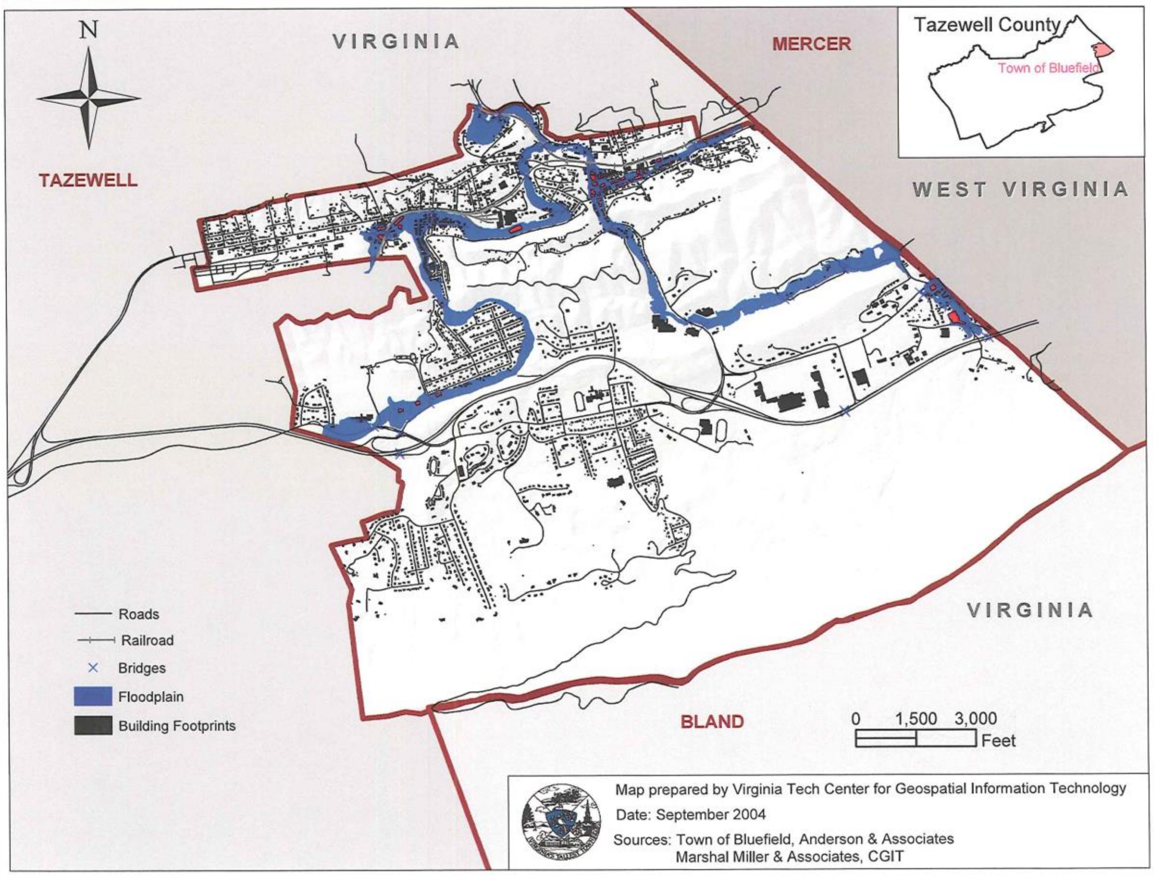
Bluefield, VA - Sub-Watersheds



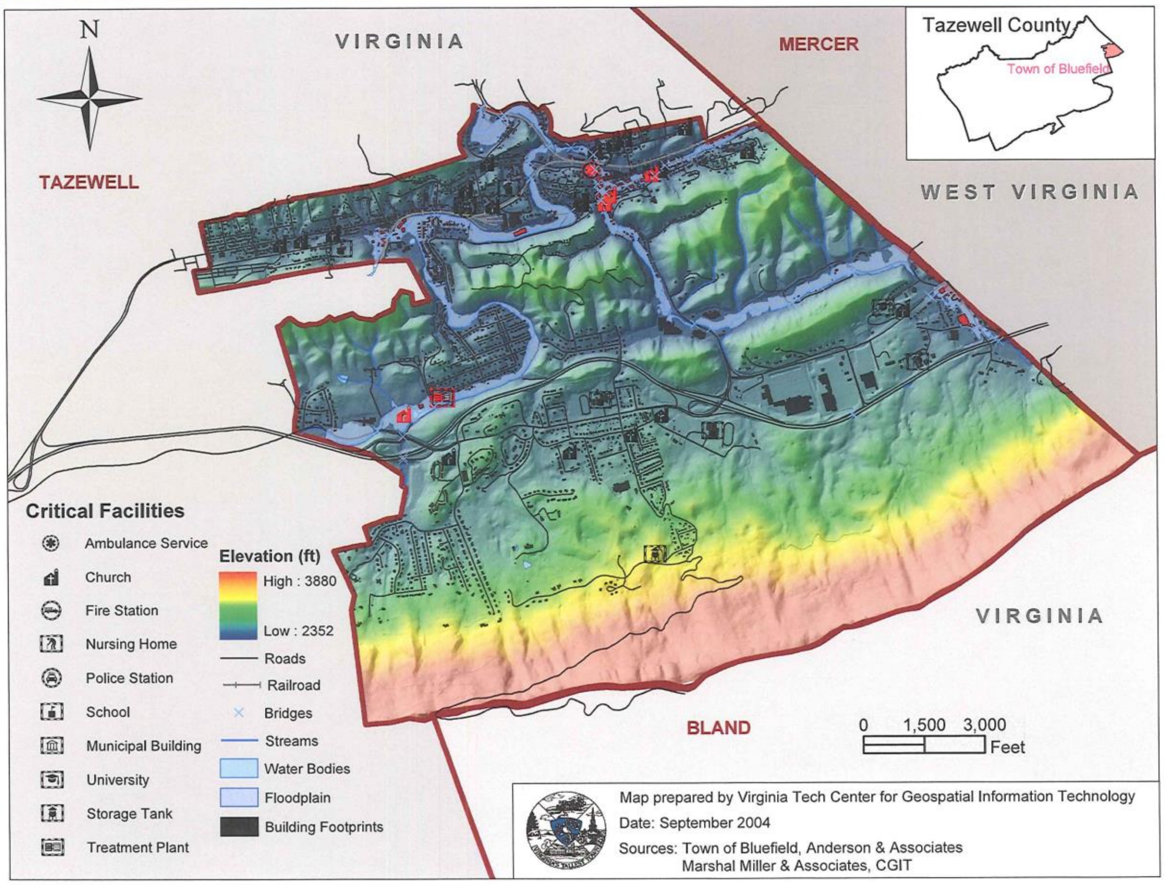
Bluefield, VA - Critical Facilities



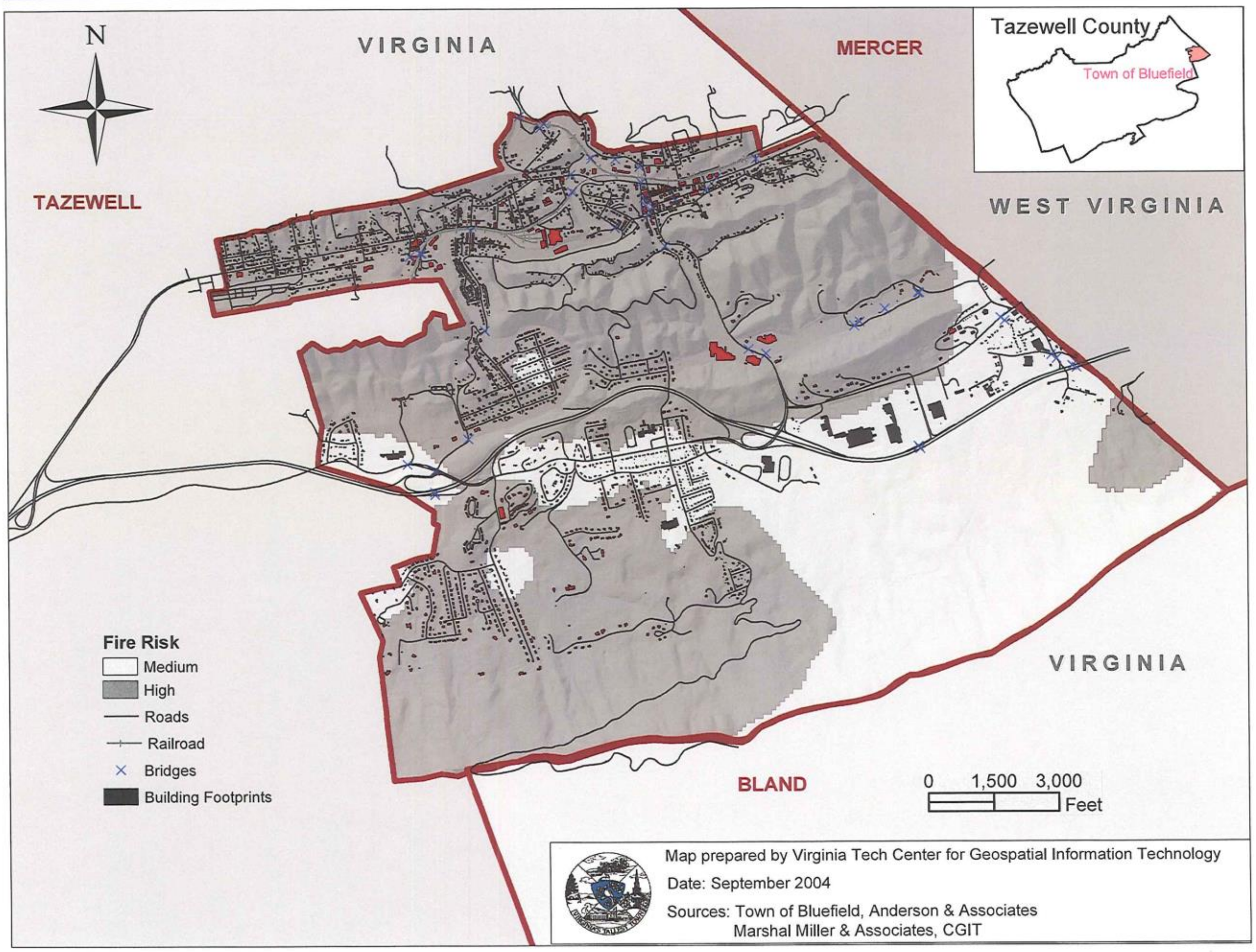
Bluefield, VA - Floodplains

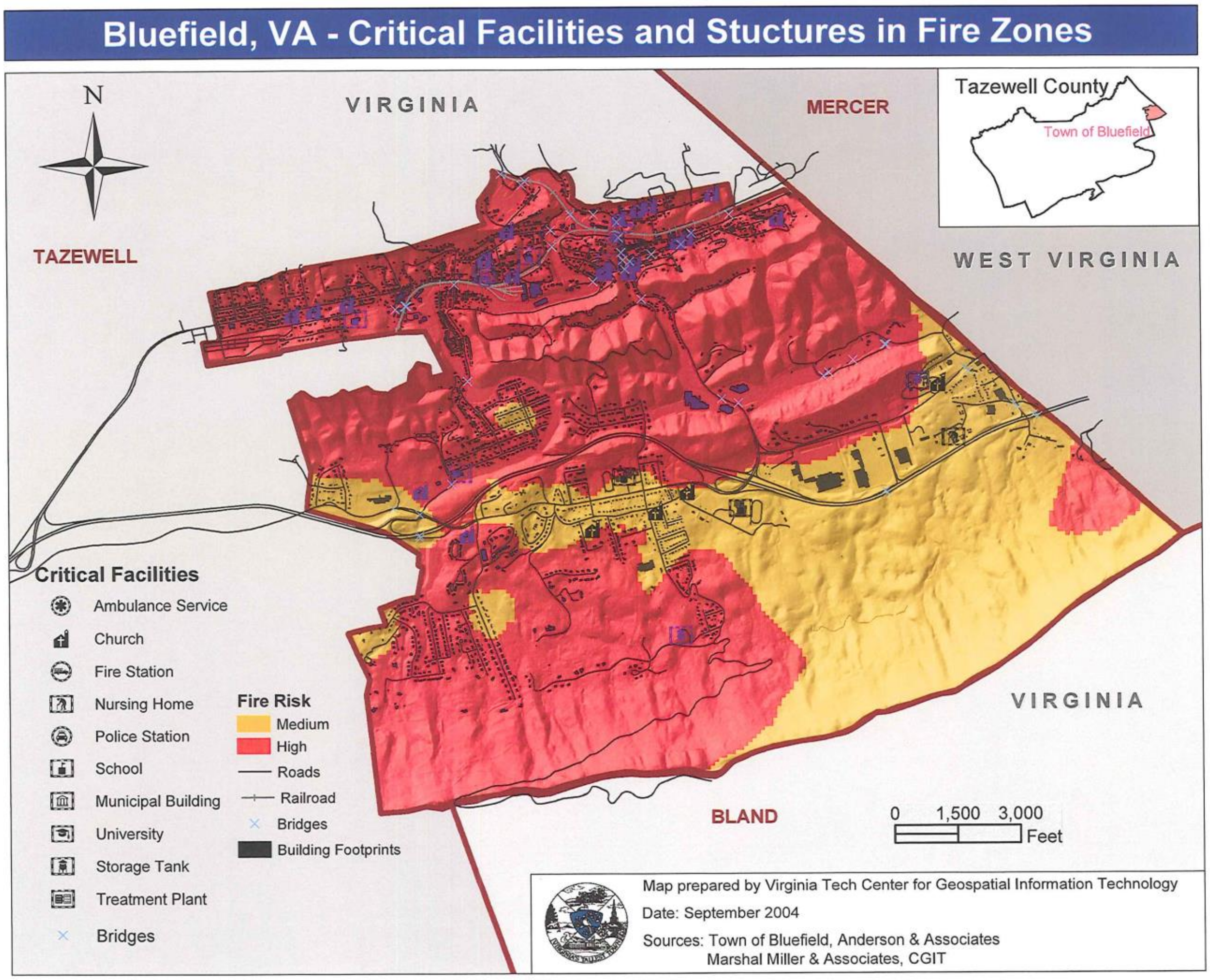


Bluefield, VA - Critical Facilities and Structures in Floodplains



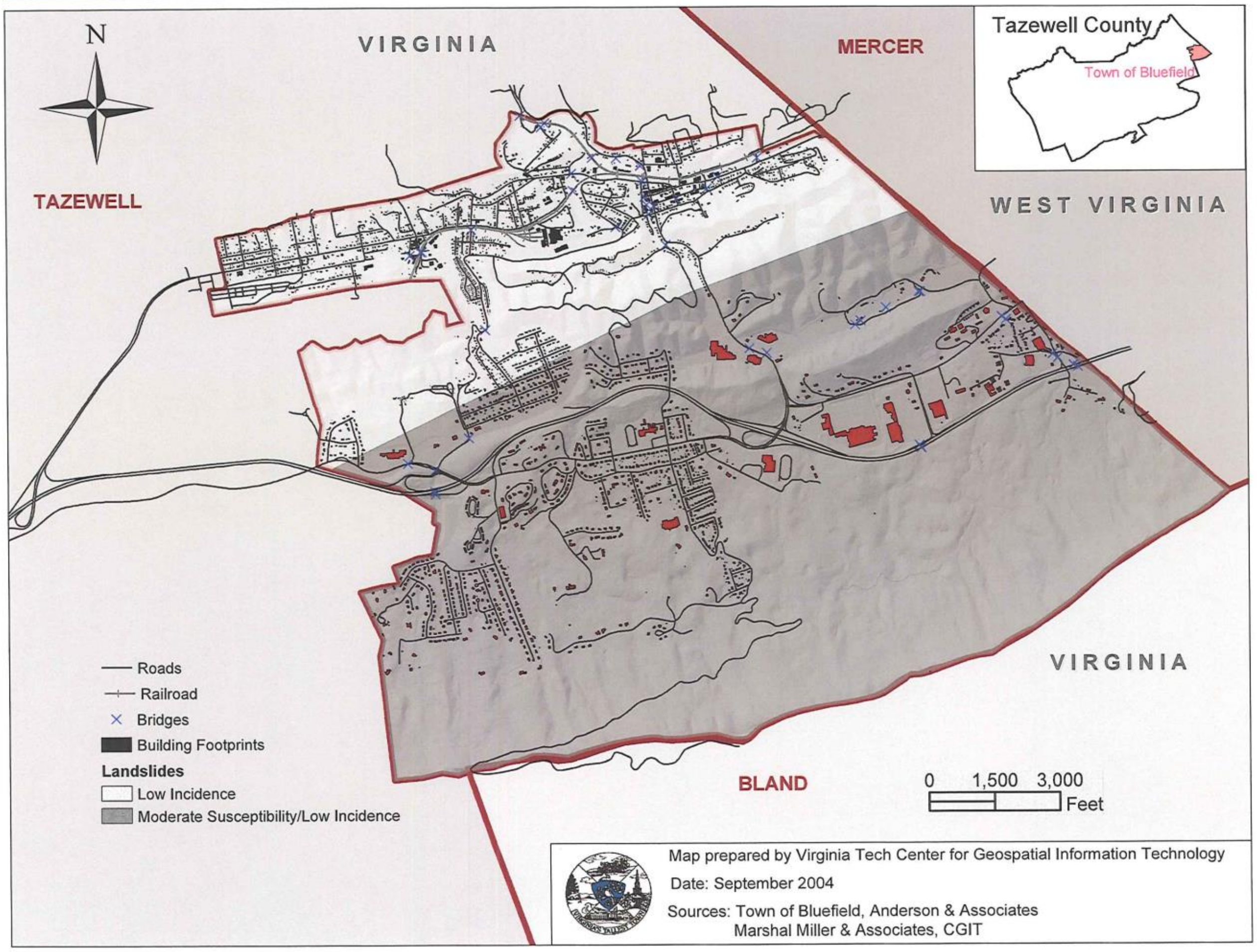
Bluefield, VA - Fire Zones



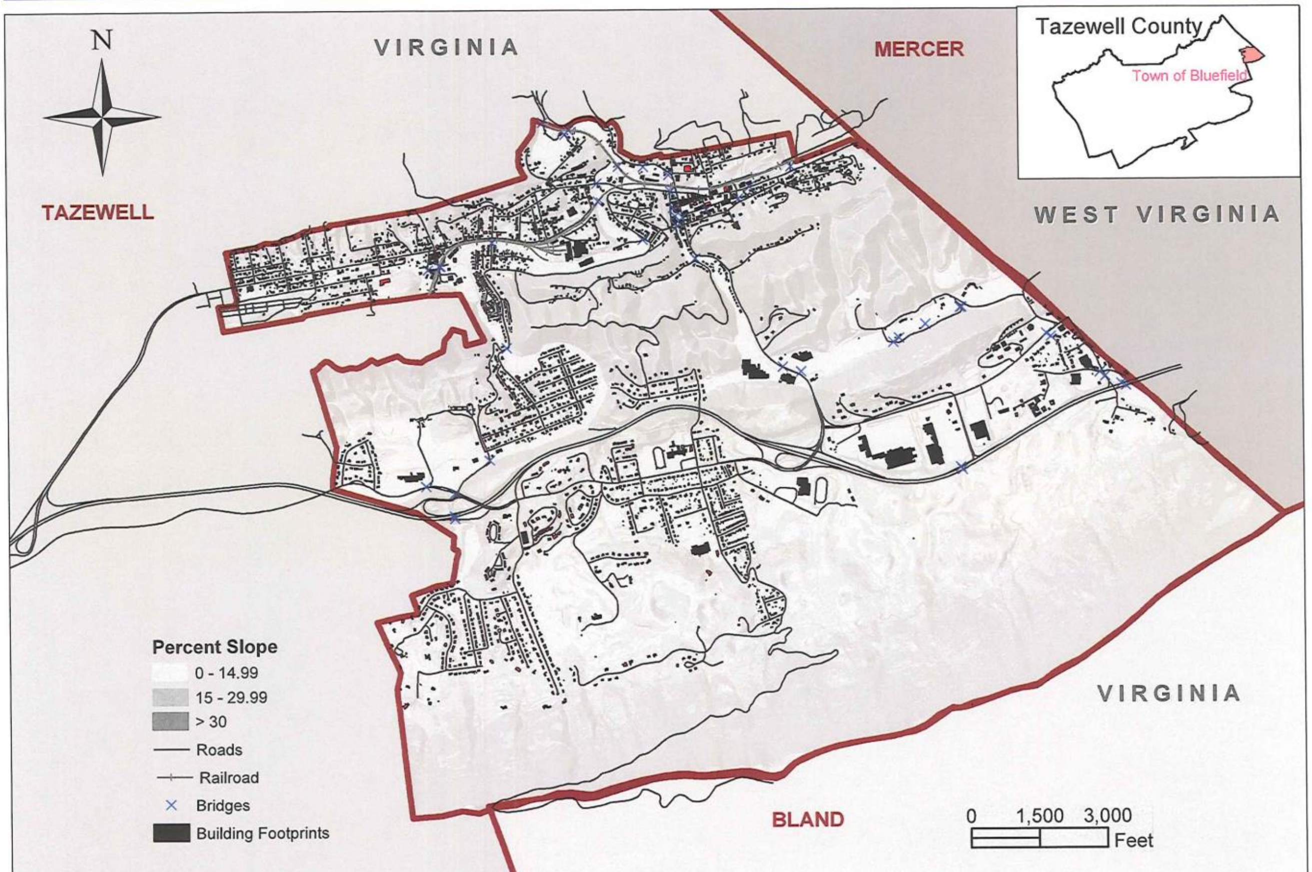


Bluefield, VA - Critical Facilities and Stuctures in Fire Zones
N
VIRGINIA
MERCER
Tazewell County
Town of Bluefield
TAZEWELL
WEST VIRGINIA
VIRGINIA
BLAND
Critical Facilities
Ambulance Service
Church
Fire Station
Nursing Home
Police Station
School
Municipal Building
University
Storage Tank
Treatment Plant
Bridges
Fire Risk
Medium
High
Roads
Railroad
Bridges
Building Footprints
0 1,500 3,000
Feet
Map prepared by Virginia Tech Center for Geospatial Information Technology
Date: September 2004
Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Landslides Zones



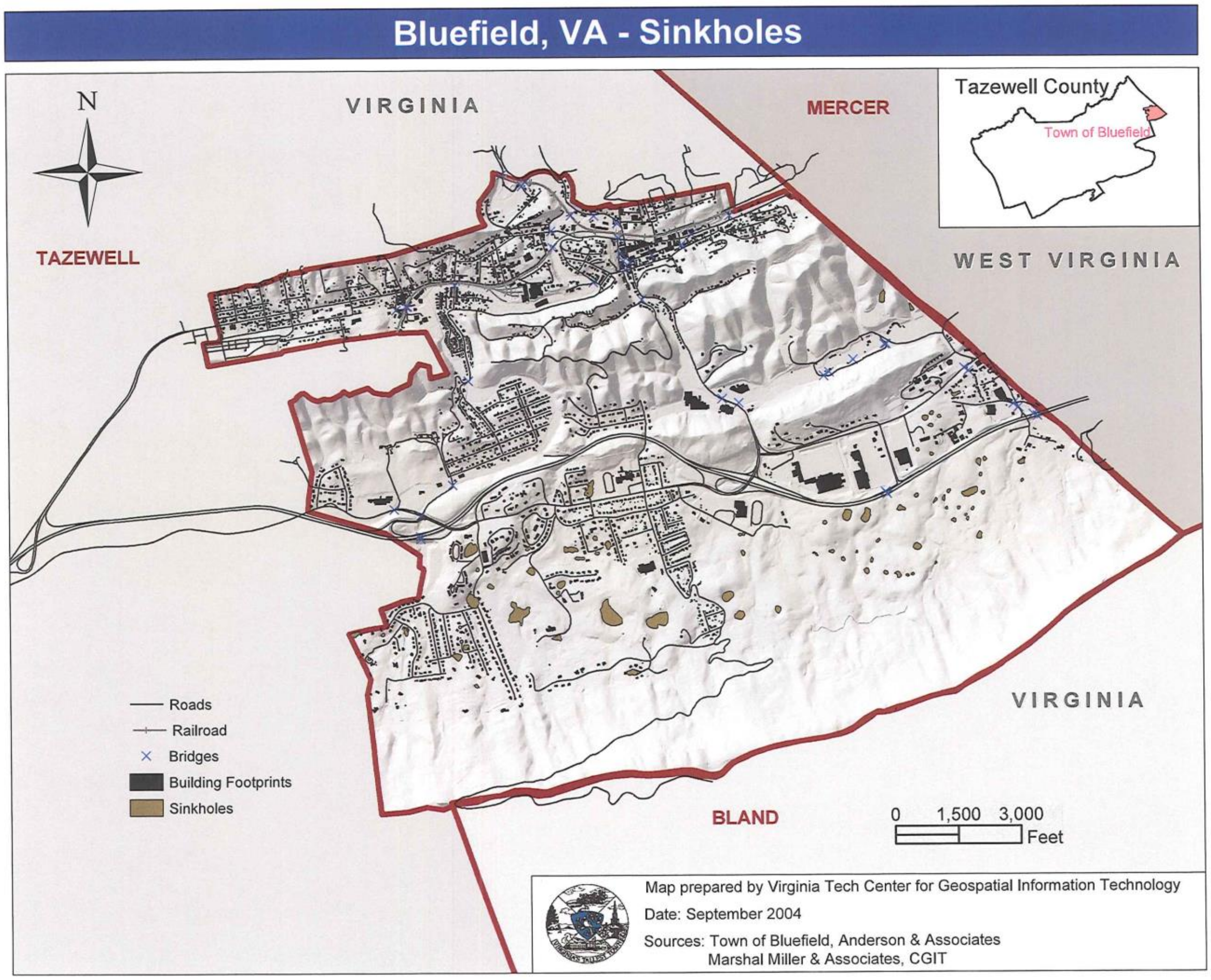
Bluefield, VA - High Slopes



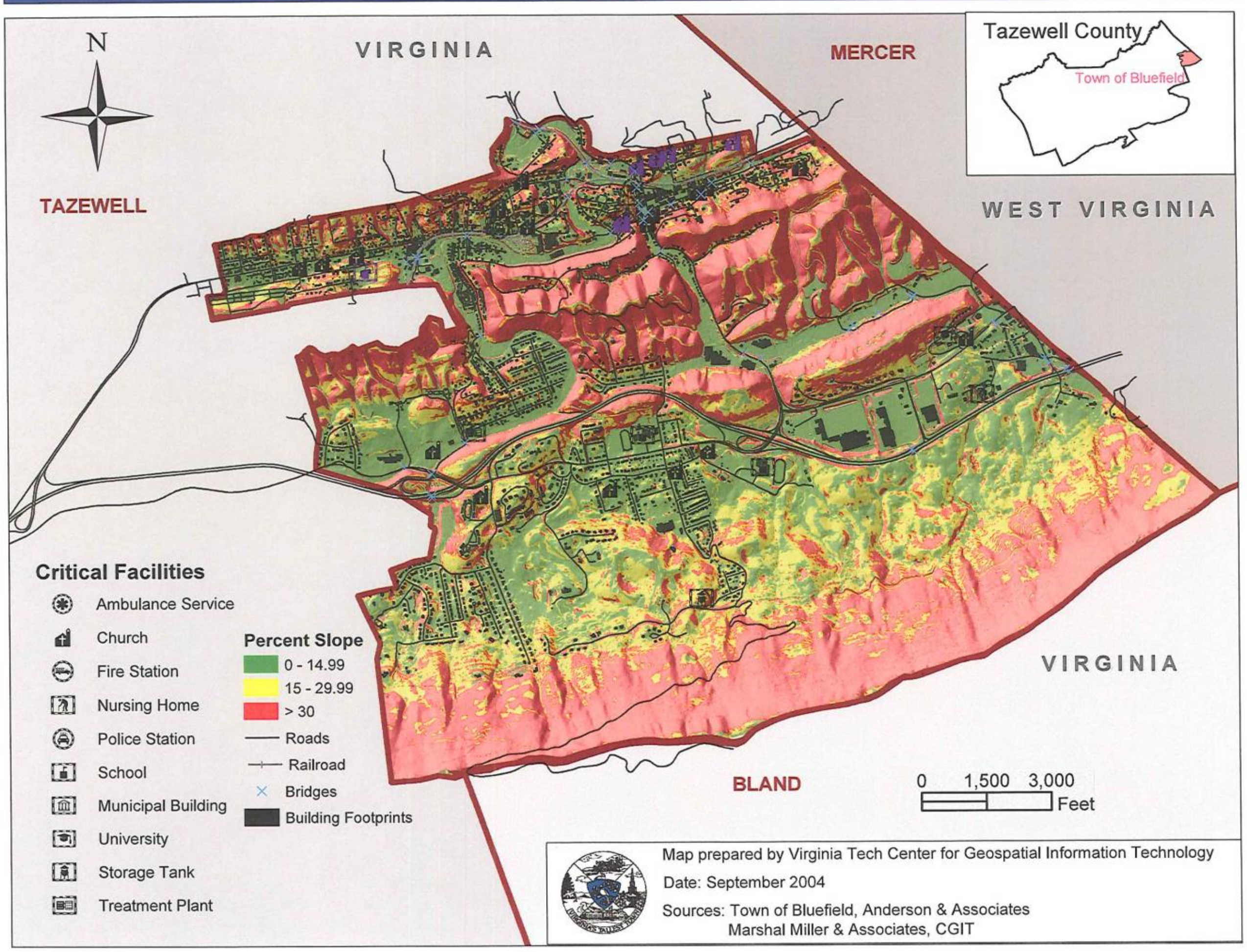
Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

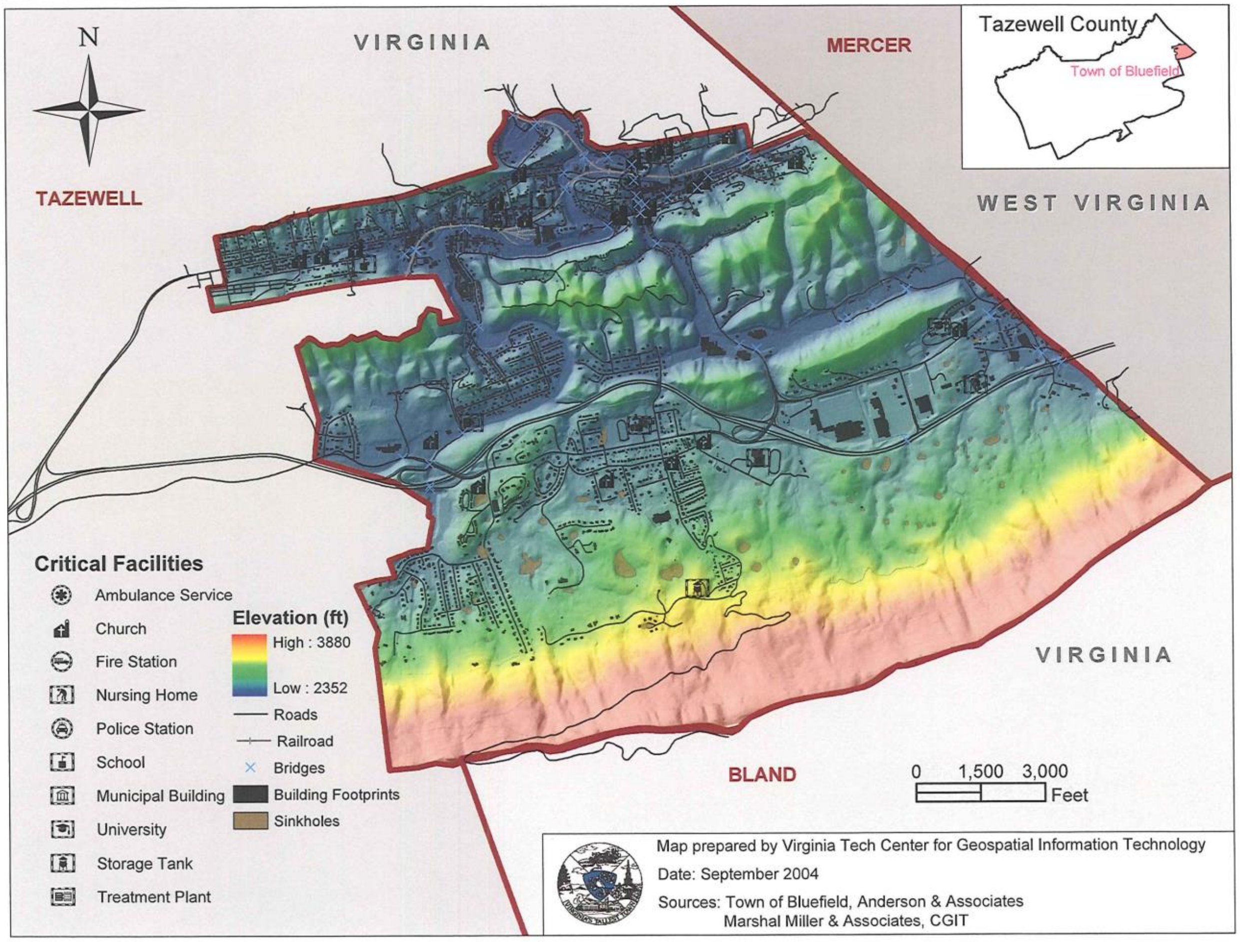
Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT


Bluefield, VA - Sinkholes
N
VIRGINIA
MERCER
Tazewell County
Town of Bluefield
TAZEWELL
WEST VIRGINIA
VIRGINIA
BLAND
Roads
Railroad
Bridges
Building Footprints
Sinkholes
0 1,500 3,000
Feet
Map prepared by Virginia Tech Center for Geospatial Information Technology
Date: September 2004
Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

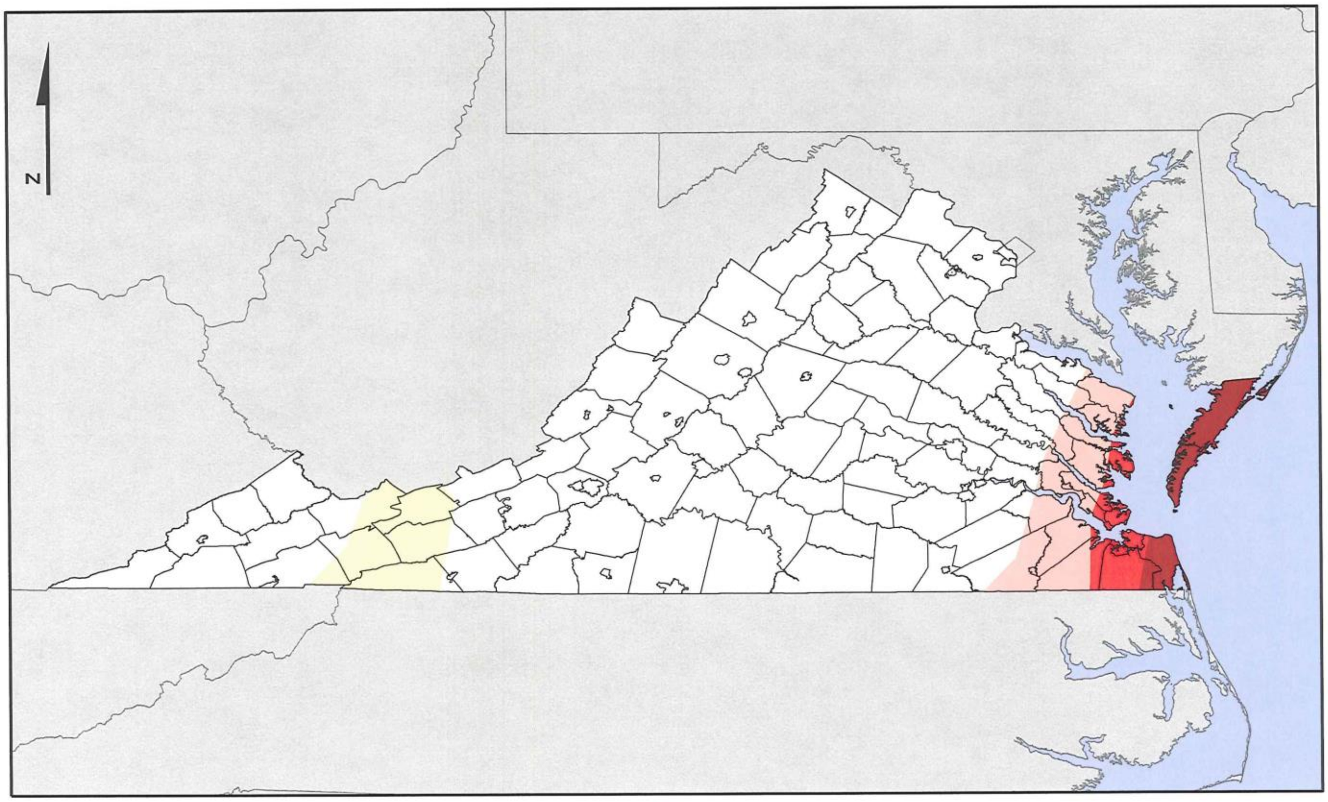
Bluefield, VA - Critical Facilities and Structures in High Slopes



Bluefield, VA - Critical Facilities and Structures near Sinkholes



BASIC WIND SPEEDS USED IN DESIGN & CONSTRUCTION



Windspeeds in miles per hour

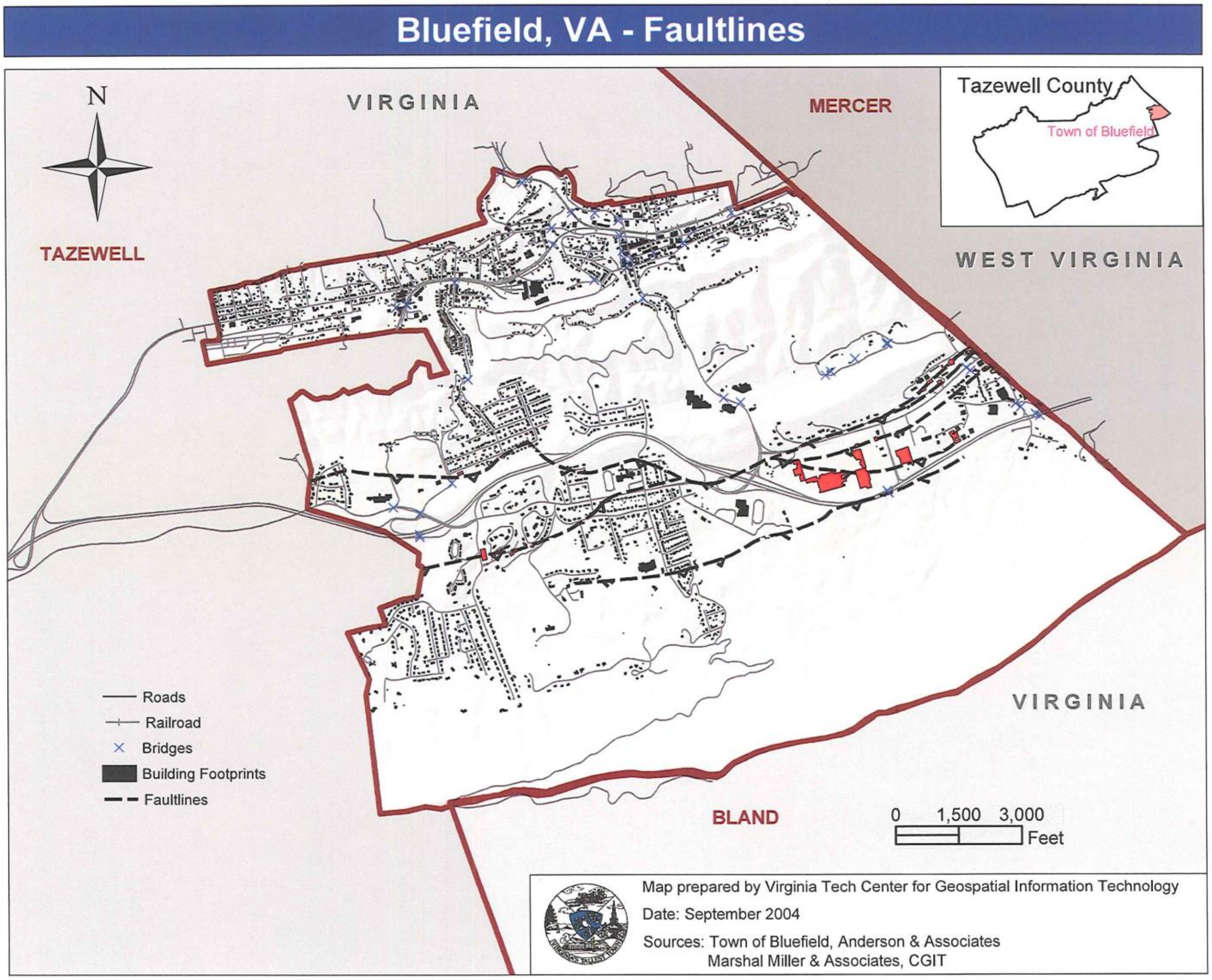
120+	90-100
100-120	80-90
Special Wind Region	

VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT

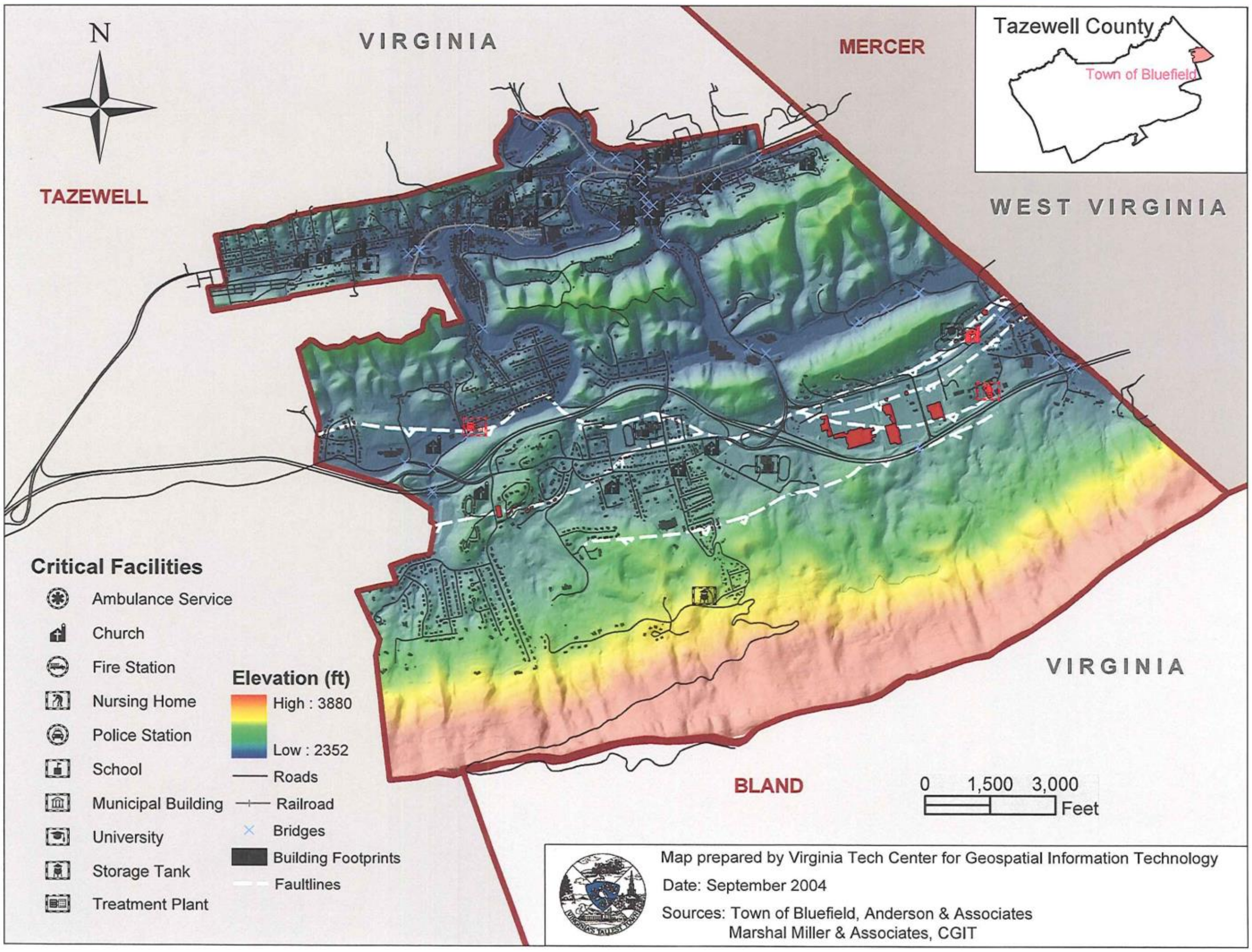
Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: July 2004

Data Sources: ASCE wind design speed, VT CGIT


Bluefield, VA - Faultlines
N
VIRGINIA
MERCER
Tazewell County
Town of Bluefield
TAZEWELL
WEST VIRGINIA
Roads
Railroad
Bridges
Building Footprints
Faultlines
VIRGINIA
BLAND
0 1,500 3,000
Feet
Map prepared by Virginia Tech Center for Geospatial Information Technology
Date: September 2004
Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities and Structures near Faultlines



Appendix C - Mitigation Alternatives

General Multi-Hazard Mitigation Alternatives

The mitigation alternatives selected should be linked to the Planning District's goals and objectives, and must address each jurisdiction's hazard risks and vulnerability outlined in the plan's Hazard Identification and Risk Assessment. The following is a list of potential mitigation measures not specific to one hazard, which can benefit a community's overall hazard reduction efforts.

Comprehensive Plans

Comprehensive plans address how and where a community should grow by guiding the rate, intensity, form, and quality of physical development. These plans address land use, economic development, transportation, recreation, environmental protection, the provision of infrastructure, and other municipal functions. Comprehensive plans help to guide other local measures such as capital improvement programs, zoning ordinances, subdivision ordinances and other community policies and programs. By integrating hazard considerations into the plan, mitigation would become integrated with community functions and could therefore be an institutionalized part of a jurisdiction's planning efforts.

Density and development patterns should reflect the Planning District communities' ability to protect their jurisdictions, the environment, and the ability to evacuate the area. Development management tools should be incorporated into the local policies that address the location, density, and use of land, with a particular emphasis on development within high-risk areas. Efforts should be made to keep people and property out of high-hazard areas whenever possible. Particularly hazardous areas could be used for recreational uses, open space, or wildlife refuges.

Capital Budget Plans

Capital budget plans typically provide for the future and ongoing provision of public facilities and infrastructure. These plans can be vital tools in keeping new development out of high-hazard areas by limiting the availability of public infrastructure. Public facilities can often be relocated to less hazardous areas in the aftermath of a disaster. Public utilities also can be relocated, or they can be upgraded or floodproofed. Power and telephone lines can be buried underground.

In order to maximize the gravity flow area of wastewater treatment plants, the facilities are often located at the lowest elevation in the community. If this point lies within a floodplain for example, consideration may be given to relocating or floodproofing such facilities. New locations for critical facilities should not be in hazard-prone areas, or in areas where their function may be impaired by a given hazard event (i.e., where water can flood the access roads). Critical facilities should be designed and/or retrofitted in order to remain functional and safe before, during, and after a hazard event.

Zoning

Zoning is by far the most common land use control technique used by local governments. While a useful tool for regulating and restricting undesirable land uses, zoning has a somewhat more limited benefit when it comes to mitigation. Zoning is most effective on new development rather than existing development, which does little to address the pre-existing development in hazardous areas. Communities with a large amount of undeveloped land will benefit much more than older, more established communities. Even for new development, the issuance of variances, special use permits, rezoning, and the failure to enforce existing codes, however, will weaken zoning's ability to prevent certain types of building practices.

Building Codes

Building codes regulate the design, construction, and maintenance of construction within most communities. These regulations prescribe standards and requirements for occupancy, maintenance, operation, construction, use, and appearance of buildings. Building codes are an effective way to ensure than new and extensive re-development projects are built to resist natural hazards. In Virginia, communities are required by law to adopt and enforce the Uniform Statewide Building Code, which has provisions for wind, water, and seismicity.

Public Outreach and Education Programs

Educating the public about what actions they can take to protect themselves and their property from the effects of natural hazards can be an effective means for reducing losses. These types of programs could target public officials, citizens, businesses, or the local construction trade. The program could cover preparedness, recovery, mitigation, and general hazard awareness information. The information could be presented in a variety of ways, from workshops, brochures, advertisements, or local media. Potential outreach and education topics include:

- Code Awareness Training
- Sheltering and Evacuation
- Flood Insurance
- School Information (Primary, Secondary, Colleges, and Universities)
- New Homeowner/Resident Information
- Emergency Preparedness for Families, Businesses, and Tourists
- Driver Safety in Disasters

- Special Needs Outreach
- Hazard Mitigation for Homeowners (including manufactured homes and trailers), Renters, and Businesses

Vegetative Maintenance

Vegetative maintenance is the pruning and maintenance of trees, bushes, and other vegetation that could increases threats to power lines during storms, or could act as fuels during wildfires. This could be applied in limited areas that have a significant vulnerability to these hazards, such as an easement or along the urban-wildland interface.

Vegetative Planting and Treatment

Vegetative planting and treatments can help to capture and filter runoff and can reduce landslides. Perennial vegetation includes grass, trees, and shrubs, which cover the soil, reduce water pollution, slow the rate of runoff, increase filtration, and prevent erosion. This type of land treatment includes maintaining trees, shrubberies, and the vegetative cover, terracing (i.e., a raised bank of earth with vertical sloping sides and a flat top to reduce surface runoff), stabilizing slopes, grass filter strips, contour plowing, and strip farming (i.e., the growing of crops in rows along a contour). Other potential options include vegetated swales, infiltration ditches, and permeable paving blocks.

Hazard-Specific Alternatives

The following is a list of potential mitigation measures that tend to work better when applied to a specific hazard.

Flood

Flood mitigation measures can be classified as structural or non-structural. In simple terms, structural mitigation attempts to eliminate the possibility of flooding at a particular location. Non-structural mitigation removes the potentially effected people or property from the potentially flooded area. The following is a list of potential mitigation measures.

Floodplain Management Ordinances

Floodplain management ordinances are weakened by development pressures, a lack of suitable sites outside of the floodplain, community desires to be near the water, inability to effectively monitor floodplain management activities, or by land use planning policies that are encouraging development into floodplain areas. Plans or policies that place more properties at risk also are reducing the storage capacity and functions of the natural floodplains. Degradation of the floodplain in this way increases flood depths and affects the reliability of Flood Insurance Rate Maps. Structures built in floodplains, particularly those that do not utilize a freeboard (that exceeds the minimum Base Flood Elevation), are consequently even more vulnerable to damage by floods.

Acquisition

Acquisition involves the purchasing of a property that is cleared and permanently held as open space. Acquisition permanently moves people and property out of harm's way, increases floodplain capacities, recreation areas and open space, and can help to preserve wetlands, forests, estuaries and other natural habitats. Participation in federally-funded grant programs requires voluntary participation by the owner. Acquisition programs can be expensive to undertake, and the property will no longer accrue taxes for the community and must be maintained, but it is by far the most effective and permanent mitigation technique. Acquisition is most effective when targeting repetitive loss structures, extremely vulnerable structures, or other high-hazard areas.

Elevation

Elevation is the raising of a structure above the Base Flood Elevation. Elevation is often the best alternative for structures that must be built or remain in flood-prone areas, and is less costly than acquisition or relocation. However, elevating a structure can increase its vulnerability to high winds and earthquakes. Some building types are either unsuitable or cost-prohibitive to elevate.

Relocation

Relocation involves the moving of a building or facility to a less hazardous area, on either the same parcel or another parcel. This measure also moves people and property out of harm's way, and is a very effective measure overall. Some building types are either unsuitable or cost-prohibitive to relocate.

Stormwater Management Plans

New development that increases the amount of impervious surfaces affects the land's ability to absorb the water and can intensify the volume of peak flow runoff. Without efficient stormwater management, runoff could cause flooding, erosion, and water quality problems. Stormwater management plans should incorporate both structural and nonstructural measures in order to be most effective. Structural measures include retention and detention facilities that minimize the increase of runoff due to impervious surfaces and new development. Retention facilities allow stormwater to seep into the groundwater. Detention systems accumulate water during peak runoff periods that will be released at off-peak times. Nonstructural measures include establishing impervious surface limit policies and maintenance programs for existing drainage systems.

Dry Floodproofing

Dry floodproofing involves making all areas below the flood protection level watertight by strengthening walls, sealing openings, using waterproof compounds, or applying plastic sheeting on the walls. This method is not recommended for residential structures, but may work well for new construction, retrofitting, or repairing a non-residential structure. Due to pressure exerted on walls and floors by floodwater, dry floodproofing is effective on depths less than 2 to 3 feet. Floodproofing of basements is not recommended.

Wet Floodproofing

The opposite of dry floodproofing, wet floodproofing lets the floodwater actually enter a structure. This technique is effective on deeper flood depths, as it does not have the same potential to build up exterior pressure. Again, this method is not recommended for residential structures and may not be used for basements under new construction, substantial improvements, or substantially damaged structures.

Storm Drainage Systems

Mitigation efforts include the installation, re-routing, or increasing the capacity of storm drainage systems. Examples include the separation of storm and sanitary sewers, addition or increase in size of drainage or retention ponds, drainage easements, or creeks and streams.

Drainage Easements

Easements can be granted that enable regulated public use of privately owned land for temporary water retention and drainage areas.

Structural Flood Control Measures

Water can be channeled away from people and property with structural control measures such as levees, dams, or floodwalls. These measures also may increase drainage and absorption capacities. These structural control measures also may increase Base Flood Elevations and could create a false sense of security.

Basement Backflow Prevention

Planning District communities should encourage the use of check valves, sump pumps, and backflow prevention devices in homes and buildings, if the infrastructure allows.

Wind

Proper engineering and design of a structure can increase a structure's ability to withstand the lateral and uplift forces of wind. Building techniques that provide a continuous load path from the roof of the structure to the foundation are generally recommended.

Windproofing

Windproofing is the modification of the design and construction of a building to resist damages from wind events, and can help to protect the building's occupants from broken glass and debris. Windproofing involves the consideration of aerodynamics, materials, and the use of external features such as storm shutters. These modifications could be integrated into the design and construction of a new structure or applied to reinforce an existing structure. Manufactured homes, which tend to be vulnerable to the effects of extreme wind events, can be protected by anchoring the structures to their foundations. Mobile homes could be tied down to their pads in order to prevent them from being destroyed. Public facilities, critical infrastructure, and public infrastructure (such as signage and traffic signals) should all be windproofed in vulnerable areas. However, windproofing is not a viable mitigation technique to protect against tornadoes.

Community Shelters/Safe Rooms

Community shelters and concrete safe rooms can offer protection and reduce the risk to life. Locations for these shelters or safe rooms are usually in concrete buildings such as shopping malls or schools. Communities lacking basements and other protection nearby should consider developing tornado shelters.

Burying Power Lines

Buried power lines can offer uninterrupted power during and after severe wind events and storms. Burying power lines can significantly enhance a community's ability to recover in the aftermath of a disaster. Buried power lines are typically more expensive to maintain and are more vulnerable to flooding. Encouraging back-up power resources in areas where burial is not feasible will enable the continuity of basic operations (e.g., security, refrigeration, and heat) for businesses and facilities when there is a loss of power.

Available Mitigation Techniques

Prevention

Preventative activities are intended to keep hazard problems from getting worse. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and Zoning
- Open space preservation
- Floodplain regulations
- Storm water management
- Drainage system maintenance
- Capital improvements programming
- Shoreline / riverine / fault zone setbacks

Property Protection

Property protection measures protect existing structures by modifying the building to withstand hazardous events, or removing structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (i.e., windproofing, floodproofing, seismic design standards, etc.)
- Insurance
- Safe rooms

Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their mitigation functions. Such areas include floodplains, wetlands, and dunes. Parks, recreation or conservation agencies, and organizations often implement these measures. Examples include:

- Floodplain protection
- Riparian buffers
- Fire resistant landscaping
- Fuel Breaks
- Erosion and sediment control
- Wetland preservation and restoration

- Habitat preservation
- Slope stabilization

Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Levees / dikes / floodwalls / seawalls
- Diversions / Detention / Retention
- Channel modification
- Storm sewers
- Wind retrofitting
- Utility protection/upgrades

Emergency Services

Although not typically considered a "mitigation technique," emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Sandbagging for flood protection
- Installing shutters for wind protection

Public Information and Awareness

Public Information and awareness activities are used to advise residents, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure

- Library materials
- School children education
- Hazard expositions
- Websites

APPENDIX D — PUBLIC ANNOUNCEMENTS

The following email was sent to contact the 4 counties' Emergency Managers in August 2018:

From: Charlie Perkins
Sent: Tuesday, August 28, 2018 1:38 PM
To: rthacker@dc911.org; jess.powers@russellcountyva.us; bart.chambers@buchanancounty-va.gov; dwhite@tazewellcounty.org
Cc: Shane Farmer
Subject: Hazard Mitigation Plan -- 2018 Update -- Cumberland Plateau PDC

Hello all,

The Cumberland Plateau Planning District Commission is required to update our district's Hazard Mitigation Plan every five years; the plan details all potential and past disasters, critical facilities, etc. in our four counties, allowing for emergency relief funding if/when any future disaster strikes.

As the counties' Emergency Managers, I will need the following information from you by September 12. Without providing this information for the updated plan, your county may be at risk of losing relief funding during future emergencies. The sooner I can receive this information, the better, so that if I need additional information or there is some confusion, we can clear all of that up by the due date for VDEM. We are currently working on a very short time-frame. Please send a brief reply to this email once you've received it, so that I can ensure everyone has received this information.

Please include the following information:

- List of all critical facilities in your county. Please also note any facilities in the floodplain or at risk from any other potential disaster (high wind, wildfire, etc). Critical facilities may also include bridges (esp. ones that are the only route in and out of a neighborhood), WTPs and other similar infrastructure that may be at risk.
- List all major disasters to affect your county since 2011.
- Please list any new potential threats to your county that may not have been listed prior to 2013 (ex. Algae bloom at Flanagan Dam).
- List any new ordinances by the county or localities related to emergency management, since 2000.
- List any Hazard Mitigation efforts undertaken by your county since 2013.
- Any current FEMA projects, or any began/completed since 2013.
- Please list any training that emergency crews may need in preparation for major catastrophes; funding may be made available to cover this training if we list it in the H.M.P.

Thank you for your time; if you would like a copy of the 2013 Hazard Mitigation Plan, let me know and I can send it your way for reference.

Charlie Perkins
Cumberland Plateau PDC
charlieperkins@bvu.net
276-889-8121

The following press release was published in several local newspapers to inform the public about an opportunity for commentary on the draft of this Hazard Mitigation Plan update:

Plateau Draft Hazard Mitigation Update Plan

Available on Website

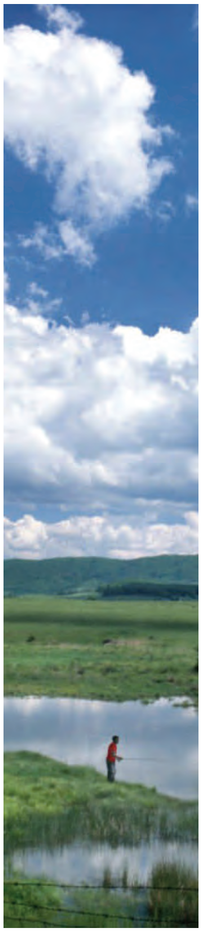
The Cumberland Plateau Planning District Commission, in cooperation with local counties and towns, has been working to complete a Regional Hazard Mitigation Plan Update for the District. A draft of entire update plan is now available for public review and comments on the Planning District's website at www.cppdc.com, listed as "Regional Hazard Mitigation Plan" under the "Reports" section. Hard copies are available by request.

Completion and adoption of the Plan is required by the Virginia Department of Emergency Management (VDEM) and the Federal Emergency Management Agency (FEMA) in order for localities to be eligible for certain pre-disaster mitigation funds.

For more information, to submit your comments, or to request a hard copy of the plan, contact Charlie Perkins at 276-889-1778.

APPENDIX E — ADOPTION RESOLUTIONS

Tazewell County 2017 Comprehensive Plan



Adopted October 3, 2017

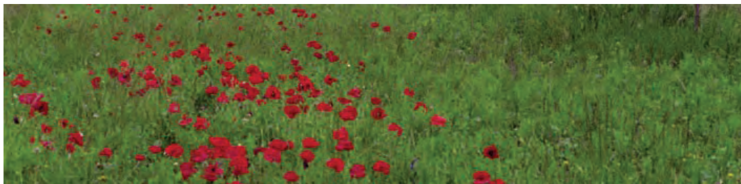


Table of Contents

Table of Contents - Figures

I. Introduction

Located in southwestern Virginia, Tazewell County sits in a region known for agricultural, historical, resource, and cultural significance. With a total area of over 500 square miles, Tazewell County has many assets and resources that require attention and regular evaluation, promotion and even regulation to manage appropriately for the wellbeing and support of the citizens and industries of the county. Additionally, many natural, cultural, educational and economic challenges faced by citizens and organizations within the county demand the attention of local, regional, state and national governmental bodies and agencies. For appropriate development to occur within Tazewell County, these governmental entities must evaluate the needs and assets of Tazewell County and develop appropriate planning, implementation policies and tools to guide the growth and development of the county to the greatest benefit of all citizens while protecting the core values, resources, and historic context of this community.

The area, now called Tazewell County, was first occupied by an indigenous people known as Woodland Indians. Little is known of these early inhabitants, but from the artifacts found in cornfields, caves, and burial grounds that are scattered across the county, it is clear that they were an organized society of people and groups. One unique artifact in the county is the pictograph display at Paint Lick Mountain. The meaning of these paintings is not empirically known, but historic researchers to the site believe they are representative of many tribes and relate to the rituals around the summer solstice. The Woodland Indians were gone long before pioneers and European settlers arrived. The Cherokee and Shawnee Indians were using the lands as hunting grounds at that time, but had no permanent settlements in the area.

The first permanent European setter was most likely Thomas Witten who built a cabin on the Big Crab Orchard Tract in 1770. This tract's previous owners include Patrick Henry. Other settlers soon arrived by way of the Wilderness Trail, most of these early pioneers being of Scotch-Irish descent.

Tazewell County was formed in 1799 and was named for Senator Henry Tazewell of Norfolk County. Senator Tazewell opposed the formation of the county and only consented to support this westward expansion of Virginia when told the county would bear his name. The original boundaries of the county consisted of an area east of present day Giles County to the Kentucky border. The current land area of the Tazewell County is approximately 520 square miles with dramatically changing elevations from 1900 to 4700 feet above sea level. Tazewell County is split along the eastern continental divide and is thus home to many headwaters and streams. To the east, the streams flow into the New River; to the north into the Big Sandy; to the west into the Clinch River; and to the south into the Holston River.

This area of Virginia is also home to growing technologies and the challenges of competing development. As with many rural communities across the country, Tazewell County is feeling the development pressures driven by suburban housing sprawl and the infrastructure and services expected and desired by the populations living there. Agricultural uses, as well as commercial, and industrial developments vie for the same areas of arable land found in the valleys and small acreages of low-slope sections of the county. Tazewell County is constantly changing and developing, just as it has throughout its history, a fact that has contributed directly to its rich and diverse community. By planning for and guiding that change toward a community-developed vision of the future, Tazewell County can maintain its most significant historic and natural treasures while still embracing the development that will employ its people and strengthen its economic base for the future. From past to present, Tazewell County has much to admire as well as a responsibility to protect valuable natural and cultural resources and promote growth and development in areas most desired by its residents.

A. The Purpose of the Plan

The purpose of a Comprehensive Plan is to provide a basis for assisting the County in promoting an optimal development pattern over the next 20 years, given existing constraints and opportunities. Recommendations are aimed at preventing haphazard and incompatible land use development through the implementation of locally-supported public policy. Additionally, the plan can help assist the county in developing strategies for better communication with citizens, businesses, and organizations functioning with the locality and with regional entities that affect county development. The Comprehensive Plan will serve as a framework for the long-range allocation of resources to meet identified needs and set the vision for land use in the county. The plan is general in nature and considers the physical, social, and economic factors that interact in the county and is the basis by which governing and recommending bodies assess development and preservation opportunities in their community.

This document is also a statement of goals and objectives designed to stimulate public interest and responsibility. A locality's plan must reflect the foresight of its leaders and the will of the citizens. It can enhance the citizens' knowledge of the developmental plans and commitment to the overall goals of the county. And, as such, the success or failure of Tazewell County's Comprehensive Plan depends primarily upon the commitment of county leaders and citizens. Periodic review and updating, the comprehensive plan may serve as the guiding vision for the community in areas of land use, population density guidelines, infrastructure enhancements, community service centers, and community involvement models.

The authority under which this plan has been prepared is contained in Chapter 15.2-2200-15.2-2224 of the Code of Virginia. It should be noted that this plan is not a law or ordinance. Rather, a recommendation by the Tazewell County Planning Commission and adoption by the Tazewell County Board of Supervisors establishes this plan as the official guide for development of the county in the areas of economic development, housing, quality of life, and land use. The implementation of this plan is accomplished by other means, such as the Subdivision Ordinance, County regulations and laws, and the Capital Improvements Program.

B. Developing and Organizing the Plan

A Comprehensive Plan is the most basic tool available to a local government that provides a means by which a community can assess these forces of change and thereby identify future needs and allocate its resources accordingly. The plan, as its name implies, is comprehensive in nature and intended to represent the long-range goals and visions for future growth and development throughout the area. The purpose of this document is to provide a set of guidelines for the future growth and development of Tazewell County.

The Comprehensive Plan consists of an inventory and analysis of past trends and development, as well as an analysis of existing conditions, and a statement of goals and objectives for the future. It should be noted that this document focuses on the unincorporated areas of the county and excludes the towns of Bluefield, Cedar Bluff, Pocahontas, Richlands, and Tazewell, which have their own comprehensive plans.

C. Legal Basis for the Plan

Comprehensive Plans have been mandatory in Virginia for all jurisdictions since 1980. The Code of Virginia contains a broad enabling legislation for counties, cities, and towns. Virginia legislation requires local planning commissions to “prepare and recommend a Comprehensive Plan for the physical development of the territory within its jurisdiction and every governing body shall adopt a Comprehensive Plan for the territory under its jurisdictions” (Section 15.2-2223).

The basic purpose of the plan is established in the Code of Virginia, Section 15.2-2223, states: “The Comprehensive Plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted, and harmonious development of the territory which will, in accordance with present and probable future needs and resources, best promote the health, safety, morals, order, convenience, prosperity, and general welfare of the inhabitants.”

The State Code of Virginia mandates that the planning commission review the Comprehensive Plan every five years to determine if any amendments are needed (Section 15.2-2230). Once the Comprehensive Plan is adopted by the governing body, it has the following legal status: “Whenever a local planning commission recommends a local Comprehensive Plan or part thereof for the locality and such plan has been approved by the governing body, it shall control the general or approximate location, character, and extent of each feature shown on the plan” (Section 15.2-2232).

1. Relationship to Other Planning Efforts

A variety of documents relate directly to the planning goals outlined in the Comprehensive Plan. The Tazewell County Comprehensive Plan incorporates several documents that currently guide the development of the county in areas such as transportation, water and sewer service, and economic develop. The policies set forth in these documents are an integral component of the revised Comprehensive Plan and thereby reinforce the goals and objectives presented herein. The following list represents documents and planning efforts that have substantial impact on the development of this plan:

· Tazewell County's Tourism Strategic Plan

· Tazewell County's Strategic Economic Development Plan

· Tazewell County Watershed Management and Water and Sewer Plan

· Tazewell County Public Schools' Report Card

· Tazewell County Directory of Community Resources

· VDOT Access Management Regulations

· VDOT Chapter 527; Coordinating State and Local Transportation Planning

However, many unofficial and informal discussions and efforts have been and continue to be underway in the county and the Planning Commission commends and recognizes these efforts as crucial to the orderly and effective development and preservation efforts of the county.

2. Citizen Involvement

Comprehensive plans may be implemented through the various land use tools available to localities: an official map, a capital improvements program, a zoning ordinance and district map, a subdivision ordinance, and a mineral resources map, or some combination of any or all of the above (Section 15.2-2224). The Code also requires surveys and studies be made in preparing the plan and that the plan include methods of implementation and a current map of the area covered by the plan (Section 15.2-2224). Specific procedural requirements are contained in the Code to ensure at least a minimum level of public notice, so that citizens have an opportunity to provide their ideas and comments on the plan (Section 15.2-2225).

Citizen involvement in the planning process is a central requirement for a Comprehensive Plan. Citizen involvement assures that the plan adequately serves the community and all its residents. Diverse opinions assure that the plan is broad based. Since the county's Comprehensive Plan drafted in 1996, the county has worked with established and informal citizen groups to gain insight and representation during the development of the previous plan edition in 2008 . Several topic-oriented committees were established in 2005 to gather data and form the backbone of that plan for the various areas of study and focus. Following this important data gathering phase, the committees developed comprehensive reports and recommendations that have been incorporated into the plan. Additional citizen input from 2008 came in many forms including surveys, interviews, neighborhood meetings, and public meetings. This process provided notable sources of public input into the planning process. The guidance of this plan for the future is more beneficial because it is truly developed by the citizens of the county. A working committee with representation from the Planning Commission, was established in the spring of 2012 to guide the 2015 Comprehensive Plan planning process, based on changes from the 2008 Comprehensive Plan and data updates from federal, state, and local agencies.

D. Adoption Process for the Plan

Following the completion of the Draft Comprehensive Plan, the Planning Commission and the Board of Supervisors will hold a public hearing to allow citizens the opportunity to provide comment on the document. The Comprehensive Plan is recommended for adoption by the Planning Commission and must be officially adopted by the Board of Supervisors. Once the plan is adopted by the governing body, it becomes an official plan for the county.

Upon adoption of the Comprehensive Plan, all amendments to it shall be recommended, approved, and adopted in accordance with the requirements set forth in the Code of Virginia (Sec. 15.2-2229). The Board of Supervisors may direct the Planning Commission to prepare an amendment to the plan and submit it to public hearing within sixty days after formal written request by the board (Sec. 15.2-2229). The purpose of this process is to allow for amendments that must be made to the plan prior to the completion of the required review at the end of five years. By allowing for the gradual update of the plan, all of the major components will have been replaced or substantially revised to meet changed or future needs.

E. Planning for the Future

Planning helps to focus efforts and to access the most value from community resources. Planning creates a better place to live for current and for future generations. The complexity and interdependence of the world create impacts on Tazewell County and its residents. Without planning, these impacts can be unexpected and nearly always detrimental. Communities plan because it is the responsible thing to do.

1. Organization of this Plan

The 2013 Tazewell County Comprehensive Plan is organized into six chapters. Five chapters focus on the topical areas of assessment and review for development. These chapters contain demographic and area-specific information and are followed by the implementation that integrates goals, objectives, and strategies into the plan. The final chapter contains components that reflect the land use desires of the citizens of Tazewell County.

The Tazewell County Planning Commission meets regularly to discuss land use issues and provide guidance to the Board of Supervisors in areas of subdivision layout and protection and mitigation of environmental concerns of the county. In addition, there are many other departments within the county government structure as well as myriad of community-based organizations that work to advance the county and its citizens. These groups working together toward a common goal can bring the energy and resources necessary to reach the stated goals of Tazewell County. Each of the main heading categories were areas of specific focus that emerged from the Comprehensive Planning Task Force Committees during the last Comprehensive Plan cycle as critical areas for attention in the near future. The Tazewell County Planning Commission Comprehensive Plan Subcommittee chose to continue with these categories with this plan. With each category, there is a description of the current situation, which is then followed by the goals, objectives and strategies for this five-year cycle of planning for the county.

II. Location and Geography

A. Regional Perspective

Tazewell County is located in the north central portion of southwestern Virginia. The county lies within the valley and ridge province of the Appalachian Mountains on the southeast with the Cumberland Plateau and Allegheny Mountains on the northeast. Tazewell County is bordered by West Virginia on the north, Buchanan County and Russell County on the west, Smyth County on the south and Bland County on the east. It is one of four counties that comprise the Cumberland Plateau Planning District. Tazewell County is 520-square miles (the 20th largest out of 95 Counties and 39 Independent Cities in Virginia) and represents 27.5 percent of the total land area of the district.

B. Topography and Geography

Topographic features of Tazewell County are shown on the geographic features map. Elevation in the valley areas of the county ranges from 1,900 feet in the western and southeastern areas to 2,763 in the east central areas. The county is dissected by streams, and the presence of sinkholes that are the trademark of karst topography which gives the landscape its uneven relief pattern. Surface features range from sloping to hilly and steep with comparatively small areas of smooth and gently rolling sections across the county.

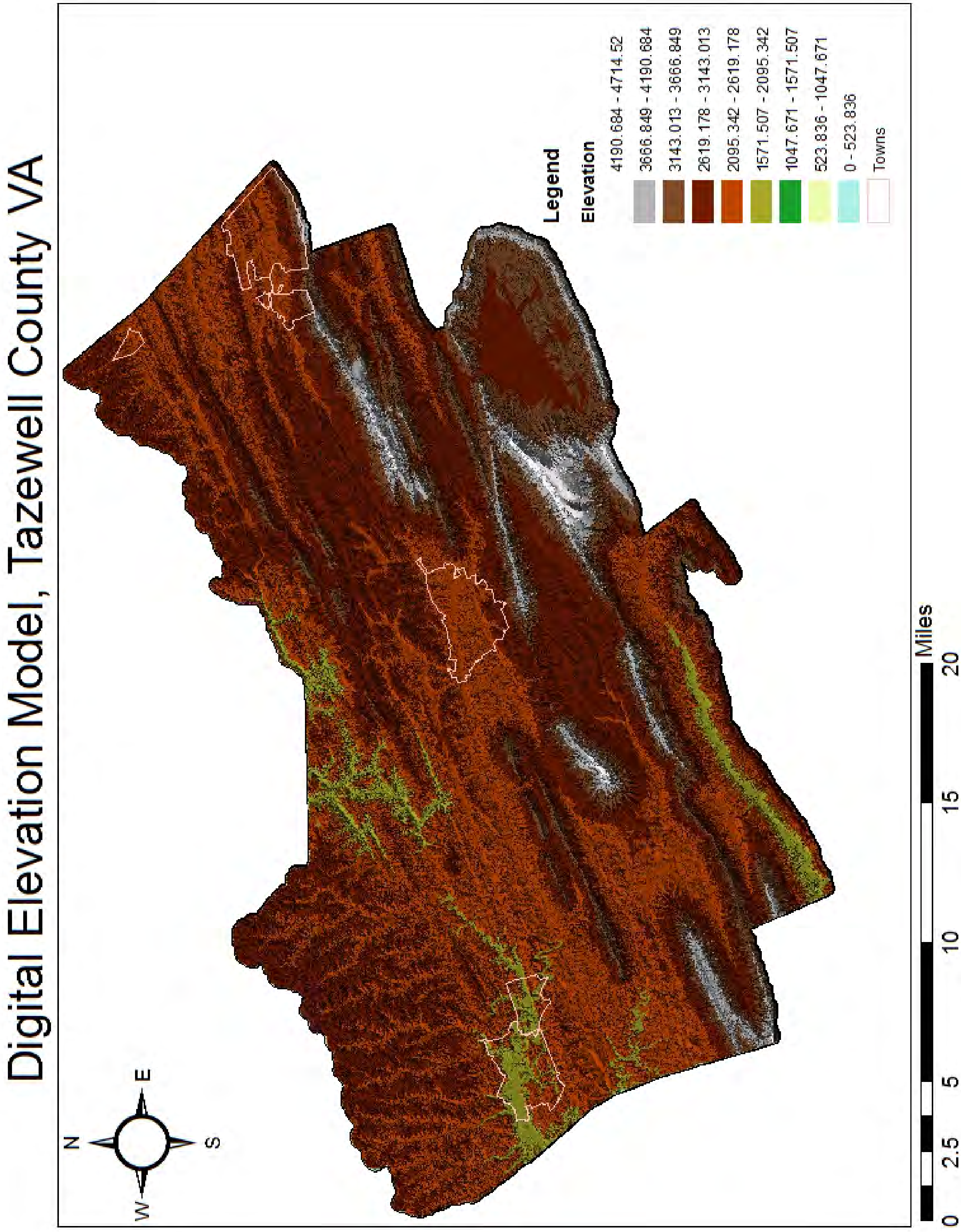
The mountain ridges range in elevation from 2,500 to 4,500 feet, though there are irregular peaks that are considerably higher. The ridges are penetrated by narrow, deep waterways that are sourced near the mountain summits. The mountainous terrain in the county creates innumerable scenic vistas for both residents and visitors in Tazewell County. The highly rugged character of the land also makes infrastructure and structural development difficult and expensive in many areas of the county. Much of the county's land remains as forested uplands with agricultural production a principle land use for the hill and valley areas.

Figure 2.1
Tazewell County Woodland Uses

Year	Woodland (acres)	
	Pastured	Non-Pastured
1982	14,008	26,710
1987	16,560	23,271
1992	18,830	23,615
1997	15,483	32,445
2002	16,818	23,426
2007	15,797	23,140

U.S. Census of Agriculture, 2007.

Figure 2.2
Tazewell County Digital Elevation Model



Burkes Garden is a unique feature in Tazewell County and is Virginia's largest rural historic district. The 32,000-acre oval-shaped basin is located in the eastern part of the county. The rock layers that formed this basin were once a great dome. The basin was created by geologic erosion to point that just a rim of hard rock was left surrounding the basin floor of water-soluble layers of limestone. Burkes Garden is home to the largest contiguous area of smooth uplands in the county.

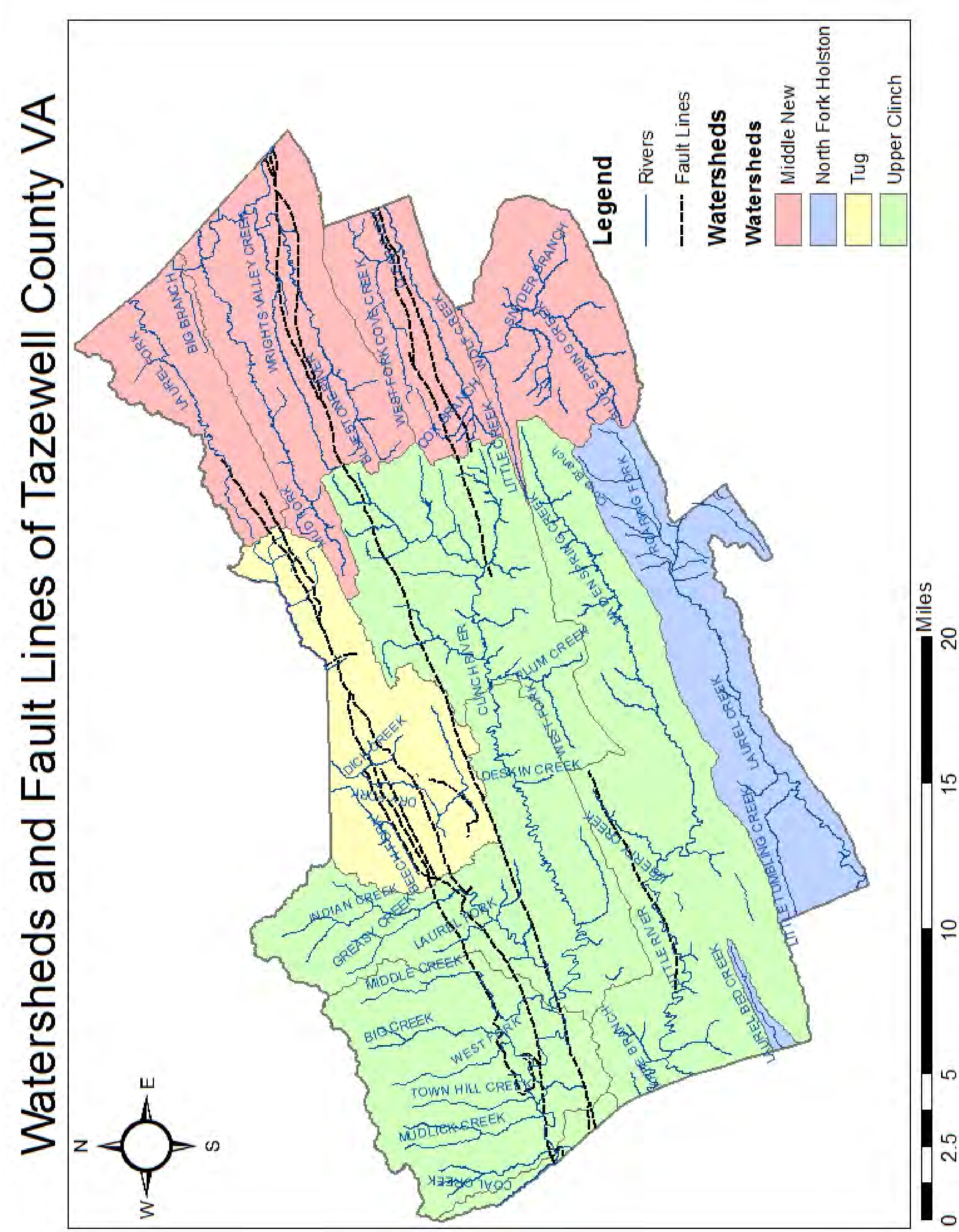
The watersheds and fault lines of the county are shown in Figure 2.2. Geology is a significant factor in the development patterns of Tazewell County. The county has two distinct geological variations: the Appalachian Ridge and Valley Province in the northeastern and southwestern portions of the county, and the Appalachian Plateau Province in the western area of the county.

The Appalachian Ridge and Valley Province has various rock formations following the narrow bands of ridges and corresponding valleys. Limestone and dolomite with intermittent shale are the predominant rock types in the valley floors and mountain flanks, while weather-resistant hard sandstone strata form the ridge crests. The arrangement of hard and soft rocks in alternate formation accounts for the various elongated ridges and the position of most streams in the county. The limestone beds have provided the richest agricultural soils and the most important groundwater aquifers. They also are driving creators of the county's caverns and associated karst topography. This combination of rock and soil suitability has targeted this area for development as well as rich agricultural uses in these areas of the county. However, these geological features are severe limiting factors for the building environment of commercial, industrial, and residential development in the county.

The western section of the county has a distinct and abrupt geological and physiological change in landscape due to its location in the Appalachian Plateau Province. This area is characterized by steep mountains with narrow, winding valley floors. The rock layers that define the plateau lie relatively flat and have been deeply dissected by historic stream drainage erosion. This portion of the county is divided into two distinct areas by the St. Clair, Boissevain and Richlands Fault System. This is coal-bearing land and has long been dominated by the coal extraction industry.

Figure 2.3

Watersheds and Fault Lines of Tazewell County



III. Background and Demographics

A. Historic Development Patterns

Formed from the counties of Russell and Wythe, Tazewell County was named in honor of Senator Henry Tazewell who made the motion to create the county. Chartered on December 19, 1799, Tazewell County is governed by a Board of Supervisors composed of five representatives, one elected from each magisterial district, who then appoint a county administrator. There are five incorporated towns within its boundaries: Bluefield, Cedar Bluff, Pocahontas, Richlands, and Tazewell.

In order to look forward and plan for future development and community enhancement, it is critical to assess historic trends and cultural influences that affect how a community has grown and developed to date. Tazewell County has a rich history in westward expansion and it's more recent growth patterns and statistics have greatly influenced the use of resources and delivery of services to citizens of the county. This section attempts to provide a brief history of the development of the county and provide general demographic change information that impacts the opportunities and challenges to land use and preservation.

Before the arrival of European settlers in North America, the region now known as Tazewell County was hunting grounds for the Cherokee and Shawnee Indians. As was stated earlier in the Plan, the Woodland Indians who were the initial settlers of this area had long departed the land. Less than 150 years after the first European colony was established in Jamestown, settlers began to explore the present region of southwestern Virginia. Since it was bountiful with large herds of deer, elk, buffalo, and other game, this area of the state was exploited by professional hunters who exported animal pelts from the area to Europe.

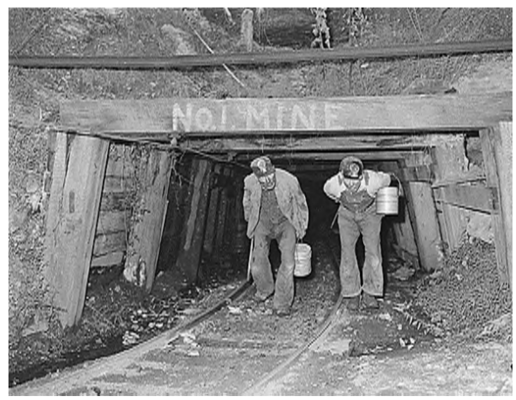
The first recorded land survey in Tazewell County was completed in 1749 when the area was part of Augusta County. Operating under the name of The Woods River Company (formed by James Patton), James Burke led a survey party into what is today Burke's Garden. The survey recorded the area of that portion of the county as 4,400 acres, but today the area is known to be more than 32,000 acres. The same surveying expedition mapped the headwaters of the Clinch River and it is presumed that they reached the Bluestone and Abbs Valley. Their records show that they reached Maiden Spring and surveyed Dry Branch near Elk Garden in what is now Russell County.

Early settlement of what became Tazewell County was slow due to the distance from the great migration road westward and also due to the hostile encounters with Indians in this area. Population figures of 1800, during the county's formation, show it as significantly less populated than surrounding jurisdictions. Even into the early 19th century development of the county was hampered by the difficulty in securing clear title to land due to the large-scale land speculation of the times.

Tazewell County's pioneer past forms a tradition that is a continued source of pride for the current residents and is reflected in the large number of historic sites in and around the county. The link to pioneer and Indian ancestors is strong and reflected in monuments and museum exhibits and holdings.

B. Demographics and Background

Population growth and diversity trends are key elements to understanding and implementing planning principles and strategies. Understanding and predicting the future trends in the demographics of Tazewell County are central to determining how and why particular land use strategies will be successful in this community. In the same way the geography and climate affect land use decision, the diversity and growth trends of the population can dramatically influence how land is used and what will be sustainable and successful strategies of maximizing resources and protecting valued assets within the county.



Tazewell County saw steady and at times dramatic growth through the early 1900s. This growth stalled after a 1950 high of 47,512 that marked the turning point toward population decline through 1970, which logged in a population for the county of 39,816. The coal boom in the 1970s also was a time of dramatic growth of nearly 27 percent with an all-time high in population for the county in 1980 of 50,511. Since 1980, the population of Tazewell County has declined on average with the 2012 census estimate documenting 44,268 as the total number of people living in the county (not a statistically significant change from the 2010 figure).

As the population change table shows (Figure 3.1), the entire Cumberland Plateau Planning District (CPPD) lost population each decade since 1980. The state, however, has continued to grow at a steady pace indicating that Tazewell County and the surrounding area are not keeping pace with the Virginia population growth trends. Though there may not be a desire to keep pace with the growth of Virginia's urban centers in the northern portions of the state, the loss of population over time is a detriment to economic and community development for any community. Understanding these population losses and how to address them will be a critical factor in achieving a sustainable economic model for the county.

Figure 3.1

Population Change from 1970 – 2012

PLACE	1970	1980	1990	2000	2010	2012
Tazewell County	39,816	50,511	45,960	44,598	45,078	44,268
CPPD	112,497	140,067	123,580	118,279	113,976	112,262
Virginia	4,648,494	5,346,818	6,187,358	7,078,515	8,001,024	8,185,867

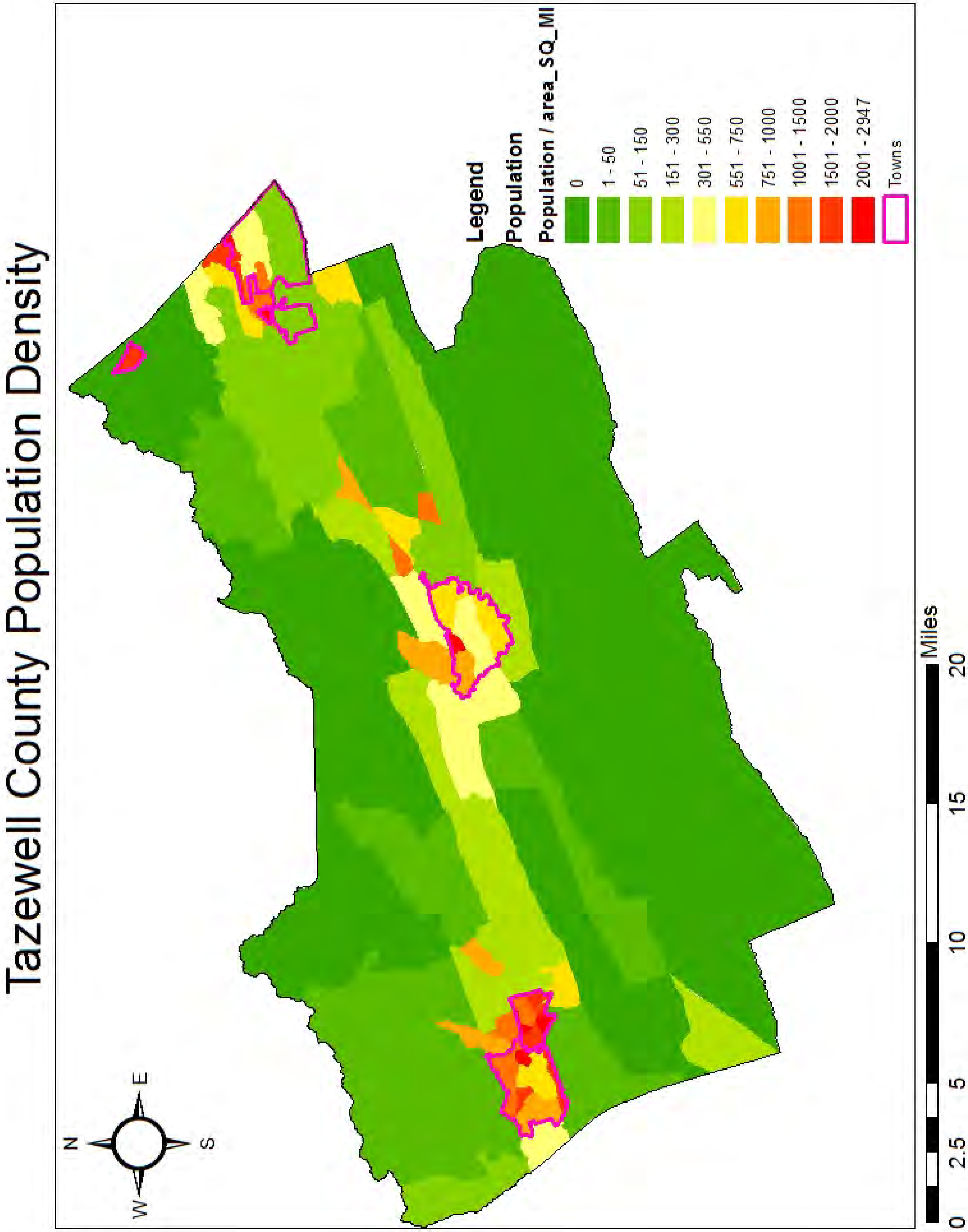
2010 US Census Bureau
****July 1, 2012 US Census Bureau estimate***

The density and diversity of population is also a relevant factor for any community development strategy and assessment. Tazewell County has a primarily white population, with minority groups totaling less than five percent of the overall population. Though this number is low compared to state (just under 29 percent) and national (nearly 22 percent) averages, Tazewell County has the highest minority population in the planning district.

Due to the geography and historic westward advancement travel routes, Tazewell County's population is not uniformly distributed. The average number of people per square mile is about 86.9 (a decrease from the 2000 census average of 87.5), but this does not reflect actual density across the county. As the population density map indicates (Figure 3.2), people live in and around the towns within the county and along major transportation routes.

Figure 3.2

Tazewell County Population Density by District in 2010



Tazewell County's gender split is relatively equal with 49.4 percent male and 50.6 percent female. The age distribution of the population is not as even in Tazewell County. Tazewell County has a large working age population with approximately 48 percent of the people in the county are between 20 and 59 years old.

Figure 3.3
Age Distribution in Tazewell County

AGE	Tazewell County			Virginia	United States
	2000	2010	% of Total Population in 2010	% of Total Population in 2010	% of Total Population in 2010
Under 5 years	2,359	2,325	5.2	6.4	6.5
5 - 17 years	7,206	6,850	15.2	16.8	17.5
18 - 64 years	28,114	28,146	62.4	64.6	63.0
65 yrs & over	6,919	7,757	17.2	12.2	13.0
Median Age (yrs)	40.7	43.2	**NA**	37.5*	37.2*
Males 18+ yrs	16,468	17,618	39.1	37.2	36.9
Females 18 + yrs	18,565	18,285	40.6	39.6	39.1

United States Census Bureau 2010
****not a percentage, this is actual median age for 2010 in Virginia and the United States***

The Age Distribution table (Figure 3.3) shows that Tazewell County's population is aging in place. Losses in population from 2000 to 2010 are evident in the under 18 age groups. Of significant note is the comparison of the median age in Tazewell (43.2 years) to that of Virginia and the US, both near the 37-year median mark. Unless there is a growth in the numbers of children and young adults over the next decade, this median age differential will continue to grow and the workforce population will begin to drift away from state and national averages as well.

Quality of life is always at the core of all community development and planning. Assessing quality is not always an easy process. Each locality has various goals and benchmarks to measure progress in targeted areas of development and service. How these goals translate into higher or sustained quality of life for citizens is not always a direct correlation and in many cases, the impact is felt long after investments in programs and infrastructure are made.

Income and access to services are considered important measures of quality of life for individuals and families. The ability to rent or own a home and maintain it is also an important measure of how well citizens of a locality are thriving. Though these measures are not the only factors in quality of life, they merit assessment and correlation for Tazewell County in relationship to the types and impact of investment in services and infrastructure by public and private sources.

Figure 3.4
Median Family Income:
County, State and National Comparison

Place	1990	2000	2010	2011	Percent Change from 2000 to 2011
Tazewell County	25,535	33,732	43,428	45,559	35.06%
Cumberland Plateau Planning District	----------	30,901	40,670	42,469	37.44%
Virginia	38,213	54,169	73,514	75,962	40.23%
United States	35,225	50,046	62,982	64,293	28.47%

U.S. Census Bureau, 1990, 2000, and 2010.
U.S. Census Bureau, 2006-2010 American Community Survey.
U.S. Census Bureau, 2007-2011 American Community Survey.

Though it is clear that Tazewell is below the median family income average of both the US and Virginia, the percent increase shows the county keeping relative pace with the state (Figure 3.4). The cost of living in Tazewell County is lower than many other areas of the state and with income levels still growing, the county residents are likely to be seeing that reflected as increases in spending power and investment opportunities. However, as in most rural areas, transportation costs are higher and almost exclusively born by individuals and families. With the significant increase in oil prices, this factor alone can be a dramatic impact on a family income balance. These are crucial factors of consideration for enhancing quality of life for individuals and families.
Figure 3.5 shows a comparison of median household income between Tazewell County residents and those in the rest of the state and with the nation. Tazewell County's household income is roughly 60 percent of the median household income of the state and 72 percent of that of the United States. The US Census defines a family as consisting of two or more people (one of whom is the householder) related by birth, marriage, or adoption residing in the same housing unit. A household consists of all people who occupy a housing unit regardless of relationship, whether it is a singular individualliving alone or multiple unrelated individuals or families living together. Family income has traditionally

been considered the more reliable measure of median income when making such comparisons. However, with the rise of unmarried housing partners, this figure must be tracked and assessed now and into the future. Tazewell County did see a large percentage increase in these figures within just a four year period with a nearly 4 percent increase from 2000 to 2010.

Figure 3.5
Median Household Income:
County, State and National Comparison

Location	1990	2000	2010	2011	Percent Change from 2000 to 2011
Tazewell County	19,670	27,304	35,485	36,521	33.76%
Cumberland Plateau Planning District	----------	25,504	33,699	33,816	32.59%
Virginia	33,328	46,677	60,665	60,665	29.97%
United States	30,056	41,994	50,046	50,429	20.09%

U.S. Census Bureau, 1990, 2000.
U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program, November 2011.
U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program, December 2012.

Health care coverage is another emerging category that local, state and national governments are taking a closer look at in this decade. The health and welfare of citizens is in no small measure dependent on access to quality and affordable health care for the care of illness and injury as well as wellness care. Tazewell County is in between the state and national averages for uninsured rates for children and youth under 18 years old with just 7.5 percent of this population uninsured in the county. The adult population rate is above the state rate with 17.1 percent of adults uninsured in the county and 14.8 percent of adults uninsured in the state. Both of these figures are below the national average of 17.7 percent.

Figure 3.6
Health Insurance Coverage, 2010

Place	Under Age 65			Under Age 18		
	# Insured	# Uninsured	% Uninsured	# Insured	# Uninsured	% Uninsured
Tazewell	29,980	6,188	17.1	8,868	724	7.5
Virginia	5,817,583	1,009,466	14.8	1,787,955	133,975	7.0
US	215,846,576	46,556,803	17.7	70,462,624	6,505,941	8.5

Model-based Small Health Insurance Estimates for Counties and States
US Census Bureau, 2010.

Tazewell County has recently constructed a premier Community Facilities Building. The new 31,682 square foot facility is strategically located at 253 Chamber Drive, Tazewell, Virginia and is visible from U. S. Route 19-460. Prior to the construction of the new Community Facilities Building, the Tazewell County Board of Supervisors and the Industrial Development Authority recognized the need to improve accessibility to government services within the locality. They partnered together to provide a highly secure, yet accessible facility that would also have ample parking in a less congested part of town.

The new state-of- the- art Community Facilities Building will allow the locality to consolidate the services of the Department of Social Services and the Virginia Department of Health under one roof which will eliminate the need for clients to travel to several different locations for the services they seek. The mission of the County of Tazewell is to effectively seek opportunities to improve the quality of life for the citizens. The true worth of this facility cannot be measured in dollars. The lasting value and underlying importance is the power of partnership to provide improved services to the community.

As the above demographic and historic data shows (Figure 3.6), Tazewell County is a dynamic area of Southwest Virginia with many challenges and opportunities as the county continues to shift economically and demographically. The need for careful planning and thoughtful evaluation of the historic trends and projections are very important for the county. This assessment of data is a critical first step in developing a strong and logical road map for the future of Tazewell County.

C. Housing Patterns and Structures

Housing is one of the most basic needs (shelter) in an individual's life. Physically, socially, and economically, housing plays an important part in the well-being of individuals as well as families, and the community. Unsafe, unsanitary, and inadequate housing can affect local residents' physical, social, economic, and emotional well-being. Planning for safe and attractive communities is an important role of local government and a diverse and aesthetically pleasing housing stock is at the heart of such vibrant and growing communities.

The coal boom years of the 1970s created growth in the number of houses built in Tazewell County at that time. Tazewell County's housing growth during this period surpassed that of the state, and the population growth as well as incomes of the time supported this growth. From 1980 to 1990, population in Tazewell County decreased as did the average household size. Housing values did increase slightly during this time and the county maintained the highest average housing value ($48,600) in 1990 within the Cumberland Plateau Planning District. This was 53 percent of the state's $90,400 average house value in 1990.

Figure 3.7
1990-2011 Owner and Renter Occupation of Housing
Tazewell County, Virginia, and U.S. Statistics

Statistic		1990 Tazewell County	1990 VA	1990 US	2000 Tazewell County	2000 VA	2000 US	2011 Tazewell County	2011 VA	2011 US
Owner-occupied housing units		13,324	1,519,644	59,031,378	14,129	1,837,939	69,815,753	13,105	2,046,845	75,896,759
Median Value owner-occupied		$48,400	$90,400	$78,500	$67,900	$125,400	$119,600	$84,900	$254,600	$186,200
Median selected monthly owner costs	*With a mortgage*	$529	$831	$737	$664	$1,144	$1,088	$901	$1,782	$1,560
	Without a mortgage	$146	$192	$209	$196	$263	$295	$286	$408	$444
Renter-occupied housing units		3,985	772,186	32,916,032	4,148	861,234	35,664,348	4,131	887,768	36,689,881
Median Gross Rent		$298	$495	$447	$376	$650	$602	$535	$1,024	$871

U.S. Census Bureau, 1990 and 2000.
U.S. Census Bureau, 2007-2011 American Community Survey 5 Year Estimates

The population centers in Tazewell County are in the towns of Tazewell, Cedar Bluff, Richlands, Pocahontas, Bluefield, and the communities of Claypool Hill and Raven. The housing stock found throughout the county includes both single family and multi-family housing options. Figure 4.4 shows the breakdown of owner and renter-occupied housing units as well as the median values from 1990 to 2011. The 2011 Census Bureau estimates show an increase in the median value of owner-occupied houses to $84,900 in Tazewell County. This value is approximately 33 percent of the state median of $254,600. I comparison, the 2000 Census Data showed Tazewell County's mean home value being 54% of the State value. Tazewell County was surpassed in housing value in 2000 by Russell County in the planning district, and continues to be with a median housing value of $89,000 by the latest census bureau estimates.

In 1990 Tazewell County had 566 housing units that lacked complete plumbing facilities. This was a major improvement of the 1970 number of 3,729 housing units lacking facilities. The county has continued to improve on this important housing measure to an estimated 143 housing units that lacked complete plumbing facilities in 2011. Given that nearly 33 percent of the housing structures in Tazewell County were built before 1960, the maintenance and rehabilitation of these older structures to provide adequate plumbing facilities is clearly evident in this area. Less than six percent of housing in the county has been built since 2000, as the rate of construction slowed dramatically from 2000 to 2011 (3.9% constructed in the years of 2000-2004, and 1.5% constructed in 2005 or later). Because housing growth is such an important indicator of economic stability and can even be used as a stimulus to economic development, this slowing of housing construction must be critically analyzed.

1. Affordable Housing

As stated earlier, Figure 3.7 shows the breakdown of owner and renter occupation in Tazewell County. The median mortgage and rent figures are important indicators of how incomes are keeping up with costs within a community. These costs are defined by the US Census to include mortgages, taxes, house protection-related insurances, fees (such as homeowner association fees), utilities, and home improvement fees (averaged annually based on the value and age of the home). Even with a median household income of $36,521, Tazewell County still is considered a “livable community” because this income can still support the median mortgage costs using 30 percent of total income or less (29.6 percent in Tazewell County). Affordable housing is defined by the U.S. Housing and Urban Department as housing for which the occupant is paying no more than 30 percent of his or her income for gross housing costs, including utilities. When housing costs grow beyond 30 percent of a household income, it has been shown to be an unsustainable economic situation for most families and individuals.

Tazewell County offers an enviable cost of living compared to state averages. In Virginia, the average Fair Market Rent (FMR) for a two-bedroom apartment is $890. In order to afford this level or rent following the 30 percent of income rule, a household must earn $2,967 per month, or $35,604 annually. This translates roughly to a $17.12/hour full-time wage earner. The comparative FMR for Tazewell County is $626, requiring a household income of $25,040. This is nearly $11,500 LESS than the median household income for the county. Full-time wage earners earning the regional average wage of $12.04/hour can afford the two-bedroom FMR rate as well. For citizens on a fixed monthly

Supplemental Security Income (SSI), however, even Tazewell County's single-bedroom FMR of $528 is not affordable by the 30 percent of income rule.

2. Subsidized and Assisted Housing Programs

Subsidized housing is available to residents of the county who meet income and/or age requirements. Elderly, as well as family housing developments, funded through the USDA's Rural Development Program, are located in the towns of Richlands and Tazewell. Figure 4.5 shows the type and number of units in each bedroom category available through the housing subsidization program known as Section 8 housing. Additionally, the US Department of Housing and Urban Development has assisted the Cumberland Plateau Regional Housing Authority to develop and operate three complexes in the county (the bottom three listed in Figure 4.5). Waiting lists exist as all of these facilities and several are undergoing renovations to accommodate wheelchairs and other mobility issues of residents.

Figure 3.8
Subsidized Housing Properties in Tazewell County

Rental Property	Location	Complex Type	Units	Bedrooms*	Renter out of pocket costs
Hunters Ridge Apartments	Richlands	Family	48	1-24 2-24	30% of adjusted monthly income
Oxford Square Apartments	Richlands	Family	87	1-31 2-56	30% of adjusted monthly income
Aspen Square Apartments	Tazewell	Family	60	1-60	30% of adjusted monthly income
Sierra Springs Apartments	Tazewell	Family	36	1-16 2-20	30% of adjusted monthly income
Tazewell Square Apartments	Tazewell	Family	56	1-24 2-32	30% of adjusted monthly income
Crescent View Apartments	Bluefield	Family	106	1-18 2-34 3-54	30% of adjusted monthly income
Indian Princess Pocahontas	Pocahontas	Family	34	N/A	N/A
Graham Manor	Bluefield	Elderly/Disabled	30	N/A	N/A
Fairfax Court	Richlands	Elderly/Disabled	34	N/A	N/A

***Numbers to left of the hyphen indicated number of bedrooms, to the right is number of units of this type**

Sources: MFH Rental (USDA RD) Property Website; Property management companies

Housing assistance is also available through the state and federal government for purchasing, refinancing, and repairing homes of residents of Tazewell County. The county is one of seven Southwestern Virginian counties designated as a Federal Target Area. This allows local residents the opportunity to apply for a lower-interest rate mortgage from the Virginia Housing and Development Authority (VHDA). This regulation also allows first-time home buyer regulations to be waived.

Weatherization, utility assistance, heating and cooling, and emergency home repair services are provided by two service organizations in the region. The Weatherization Program and the Heating Equipment Repair and Replacement Program are operated by Clinch Valley Community Action. Both are designed to assist eligible low-income residents in Tazewell County to reduce energy loss in their homes through such installations as attic insulation, heating system inspection, window and wall sealing, and insulation. The Emergency Home Repair Program is funded by the Virginia Department of Housing and Community Development and locally administered by the Appalachian Agency for Senior Citizens. This program provides repairs or makes minor modifications to homes of low-income persons. These repairs focus on the areas of plumbing, electrical, roof repair and replacement, heating, and installation of such modifications as wheelchair ramps, hand railings, grab bars, and doorway widening. Cooling assistance is also available to eligible individuals through the Department of Social Services, Clinch Valley Community Action, and the Appalachian Agency for Senior Citizens. The Virginia Water Project provides assistance to eligible citizens in the county who need wells dug, septic systems installed, septic system maintenance and repair, water tanks, or tap fees. Clinch Valley Community Action administers this program as well as the Indoor Plumbing Program that assists eligible residents who need indoor bathrooms.

3. Assisted Living and Nursing Homes

Assisted Living Facilities (ALF) are non-medical residential settings that provide or coordinate personal and health care services, 24-hour supervision, and assistance for the care of adults who are aged, infirmed or disabled. Nursing homes, on the other hand, have the primary function of the provision, on a continuing basis, of nursing services and health-related services for the treatment of inpatient care. Tazewell County residents have access to both types of facilities throughout the county and region.

The ALF gives residents an opportunity to remain as independent as possible. The services provided at these facilities vary across the country, however, most provide graduated access to services that can be used by residents as they need them. Some provide nursing home care within the facility as well. Supervision, congregate meals, and recreational activities are available to all residents at all ALF's located in Tazewell County.

Tazewell County residents who can no longer live safely in their own homes and need access to continuous care and medical attention have options for residential care in nursing homes in the county and the region. The facilities available locally are highlighted in the chart on the next page (Figure 3.9).

Figure 3.9
Assisted Living Facilities and Nursing Homes in Tazewell County

Assisted Living Facilities	**Location**	**Type of Facility**	**Number of Beds**
Westwood Center	Bluefield	Non-Ambulatory Residential Assisted Living Care	25
Mayfair House	Cedar Bluff	Non-Ambulatory Residential Assisted Living Care	60
Golden Age Assisted Living	Cedar Bluff	Non-Ambulatory Residential Assisted Living Care Special Care	49
Nursing Homes	**Location**	**Ownership/Hospital Based**	Number of Certified Beds
Heritage Hall	Tazewell	For-profit Corporation/No	180
Westwood	Bluefield	For-profit Corporation/No	65

Source: Virginia Department of Social Services Web Assisted Living Facility Search
Virginia Department of Health Directory of Long Term Care Facilities, Nov. 2012.

Housing

Summary of Needs and Opportunities

Tazewell County saw steady and at times dramatic growth through the early 1900s. This growth stalled after a 1950 high of 47,512 that marked the turning point toward population decline through 1970, which logged in a population for the County of 39,816. The coal boom in the 1970s spurred a time of dramatic growth of nearly 27 percent with an all-time high in population reached for the county of 50,511. After 1980, the population of Tazewell County declined through the 2006 census estimate documenting 44,608 as the total number of people living in the county (not a statistically significant change from the 2000 figure of 44,598). Since then, population within the County have bounced up and down. After 2006, the population of Tazewell County has rebounded somewhat through 2010, when the census found a total population of 45,078. It then declined again with the 2012 population estimates indicating a population of 44,268. With the current trend of population loss, the age distribution within the county (62.4% of the population ranging from 18 – 64 years with the Median Age of 43.2; 15.2% of the population ranging from 5 – 17 years; 5.2% of the population under 5 years of age; and 17.2% of the population over the age of 65 - 2010 Census Data), and the limited amount of affordable, appropriate and suitable housing (more assisted living options, housing with 1 floor, and facilities for disabled adults) is a cause of concern. Tazewell County is growing older, with inadequately constructed and unaffordable housing for such circumstances.

This cause of concern is the onset of the "baby-boomers." It is not uncommon for members of the aging population to choose to downsize their homes, move into an apartment or retirement community, or consider assisted living options. The planning committees within the county must be aware of the current housing availability, consider future housing needs, and plan accordingly.

Another area of concern is the affordability of housing. With the majority of the population (62.1%) being between the ages 18 and 64 years with the median age of 43.2, affordable housing is imperative for the aging population moving into retirement age and for residents who do not have the benefit of having higher paying jobs due to the lack of training, education or work experience. Individuals living on fixed incomes, SSI, or households with minimum wage earners will be those most impacted by the need for "affordable" housing.

Access and availability of adequate, diverse, and attractive housing is critical to the quality of life of all residents of Tazewell County. The county must continue to encourage the development of appropriate and desired housing stock within the county and ensure that these resources are linked directly with the provision of necessary services and access to good transportation and job opportunities.

Goal Statement:

To promote the development of decent, safe, sanitary, and affordable housing to meet present and future population needs.

Implementation of the Goal:

Increase the availability of housing by encouraging new residential development through implementation of zoning land use practices (IE. Cluster development multifamily housing, water and sewer services.

Objectives and Strategies:

1. Provide adequate and attractive housing options for County residents

    · Provide incentives to developers (density bonuses, fee reductions) to ensure the development of variety of housing types and price ranges within the county

    · Guide residential development through infrastructure improvements in targeted areas of the county

    · Assess and develop strategy for addressing workforce housing needs in the area

    · Develop strategy and partners for retirement community planning and promotion

2. Increase opportunities for low and moderate-income households to be able to afford quality, decent, safe, and sanitary housing.

    · To attract investors for more upscale housing, including condominiums, retirement centers, and assisted living.

    · Encourage the rehabilitation of residential properties.

    · Provide incentives to developers for inclusion of suitable and affordable housing.

IV. Transportation

The movement of people and goods through and around a community are important not only to the economy, but also to the development patterns of an area. As was earlier stated, Tazewell County was settled during westward expansion of this country and the towns and settlements that grew up in this area were anchored initially by agricultural settlements as well as the exploration and extraction of the salt and the coal-rich areas of the region. Of course, the geography of this area also played a significant role in the settlement and movement of people of goods. Mountains, valleys, waterways, and ridgelines all guided the placement of roads, rails, and communities.

Another factor driving this movement was the settlement of people throughout and around the county. Where people live and where they work drive the need for transportation corridors throughout Tazewell County. The relationship between where people live and where they work has changed dramatically over the past several decades and the road network in a community is not as crucial to citizens as access to clean water was to pioneers of this community.

A. Transportation Modes and Networks

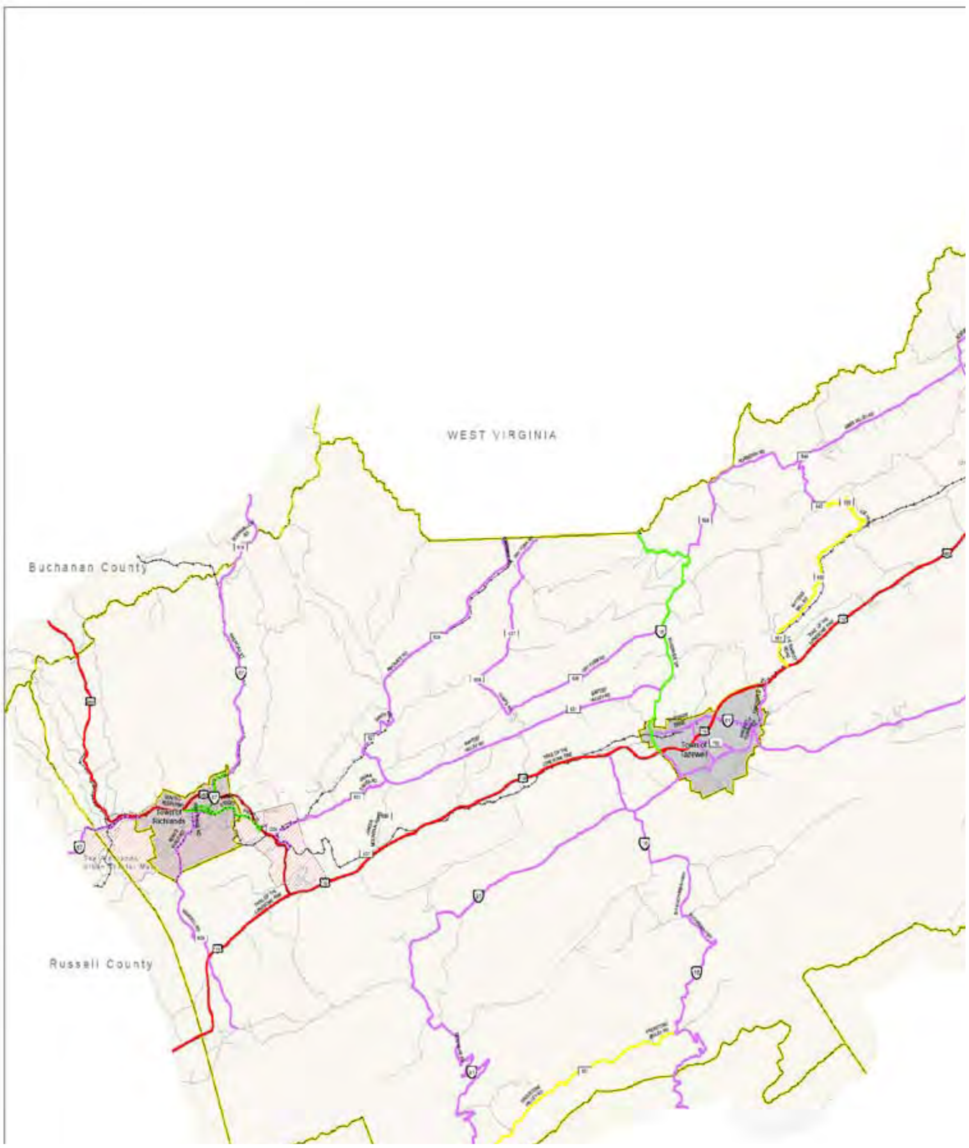
The effects of a community's transportation system upon the land are vital. A transportation plan must take into consideration topography, population density and distribution, land development policies, and the overall planning objectives of a community. Additionally, how people and goods use various networks are crucial to the development of a community and the impact on the landscape and resources of the region.

Tazewell County, located within the Cumberland Plateau Planning District is situated in Southwest Virginia near the borders of the three states of West Virginia, Kentucky and Tennessee. The network of highways running through this region includes two US numbered highways and eleven state highways. US Routes 460 and 19 runs through the center of Tazewell County linking three important county communities of Richlands, Tazewell and Bluefield as well as linking the county to Buchanan County within the region. Where these routes split (Claypool Hill), travelers diverge to take 460 toward Roanoke, Virginia to the east and Pikeville Kentucky to the west and Route 19 to Abingdon, Virginia or Bristol, Tennessee.

Interstates 81 and 77 run within 30 miles of Tazewell County's southern border and link the county and region to the rest of the eastern seaboard as well as urban centers to the west and north. These two interstate highways, along with the US and state highway networks link Tazewell County to population and economic centers within Virginia, Tennessee, Kentucky and West Virginia. Tazewell County residents as well as goods from the county can be transported using this highway network to travel to major metropolitan areas. People can easily travel to Knoxville, TN, Charlotte, NC, Roanoke, VA and Charleston, WV in less than two hours.

Figure 4.1

Primary and Secondary Road Map of Tazewell County



As the following map so vividly shows (Figure 4.2), people within the region often work in one county and live in another. Tazewell County has the largest number of citizens who live and work in their home county of any within the planning district. However, there are still a number of commuters to the county supporting the need for maintenance and efficient placement of transportation corridors within and around the county.

Figure 4.2

2010 Commuting Patterns in Cumberland Plateau PDC**

	Tazewell	**Buchanan**	**Dickenson**	**Russell**	**VA**
In place workers	11,397	5,189	2,242	5,987	3,511,116
In-Commuters	4,907	2,577	1,284	907	260,381
Out-Commuters	5,222	1,885	2,216	5,200	340,861
Net In-Commuters*	-315	-692	-932	-4,293	-80,480

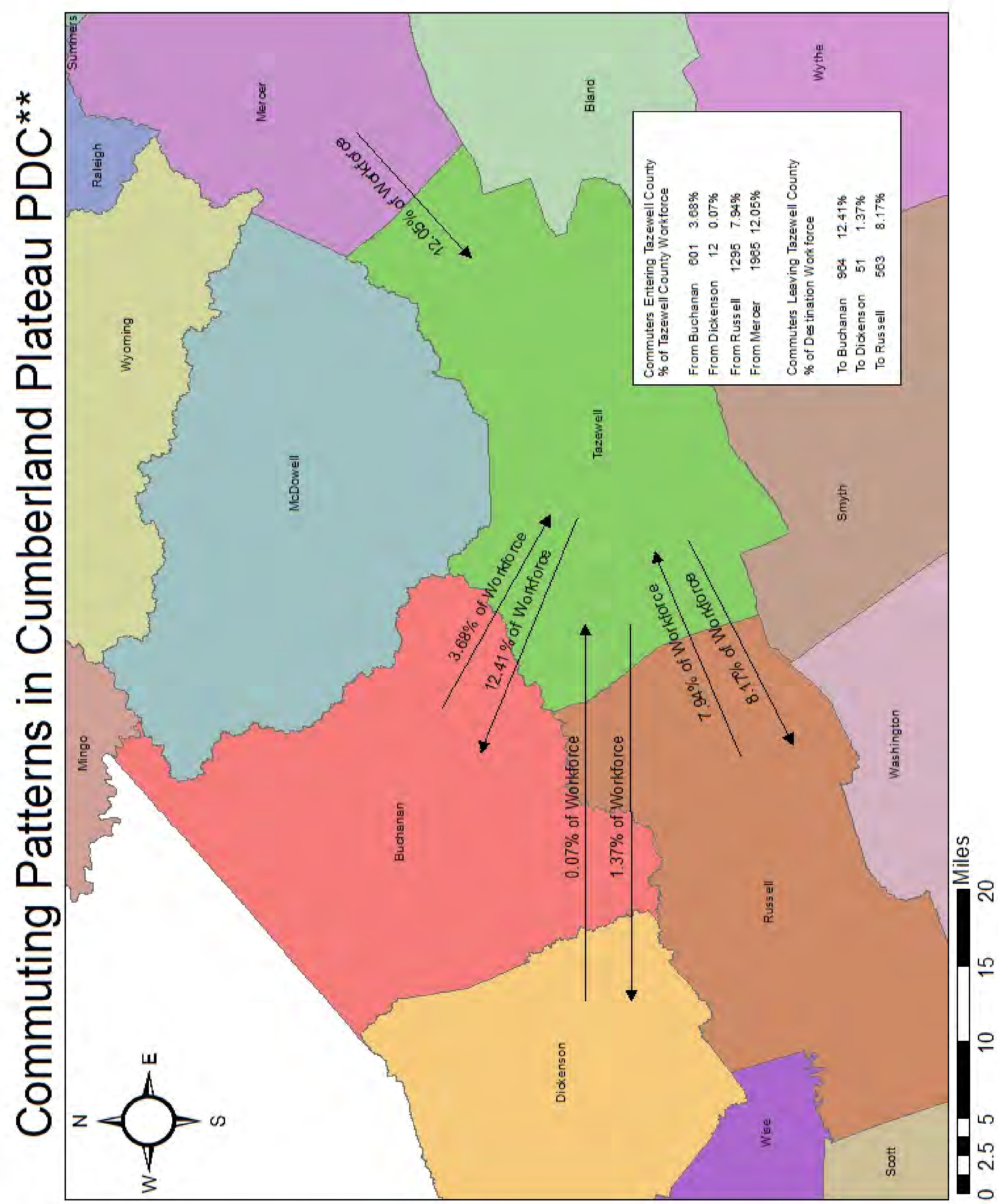
U.S. Census Bureau, 2006-2010 American Community Survey.

**** In Commuters minus Out-Commuters.***

The way people get to work is also an important indication of the transportation networks and lifestyles of citizens of the county. There was a significant increase in those traveling alone to work in a vehicle from 1990 to 2000 (Figure 4.3, see following page). This is a national phenomenon and has potential of great impact on roadways, parking, and costs of transportation for individuals and for the localities that provide the infrastructure to support vehicular transportation. Urban areas provide incentives for carpooling and public transportation and rural communities are beginning to consider these options as well. With gas prices expected to continually increase, and as the need to address public transportation and alternative transportation grows, the rural areas must not assume the concept is beyond their scope.

Figure 4.3

Map of Commuting Patterns in Cumberland Plateau PDC



Freight services in Tazewell County are provided via rail and truck lines. Rail service in the region is provided by Norfolk Southern Railroad and CSX Transportation. Tazewell County is primarily served by Norfolk and Southern which has an east-west orientation within the region. Much of the coal mined within the county is shipped out of the region via rail on this line. Over 15 major interstate truck lines serve the region, with more than 20 smaller shipping companies provide trucking services within the county and other local areas. Travelers to and from Tazewell County have the options of using rail, bus, and air in addition to personal transportation. Amtrak passenger rail services are available in Hinton, West Virginia – about one hour from Tazewell County. Greyhound-Trailways bus service is accessible to citizens of the region at stops in Abingdon, Marion, Wytheville and Bristol. Four County Transit and Graham Transit are also available for public transportation needs. Four County Transit serves the Cumberland Plateau Planning District, while Graham Transit primarily serves the Bluefield area. Connections with other transit systems can be made from these services to allow travel to other areas of the Region, such as Roanoke, Bristol, and Mercer County, WV. The Tazewell County Airport has small plane capabilities and has a 4,300-foot airplane runway and instrument landing capability for single and twin-engine general aviation uses. Additionally, easy commercial airline transportation access is available at the Tri-Cities Airport (Bristol, Kingsport, Johnson City, TN area). The Bluefield/Mercer County Airport (Mercer County, WV) offers personal and charter airline services.

Highway System

The Virginia Department of Transportation is the primary governmental agency responsible for highway development and maintenance. Tazewell County is part of the Bristol District of the Virginia Department of Transportation, which includes eight other districts, each divided into five sections: interstate, primary, urban, public transit and secondary systems. The Bristol District covers a 12 county area consisting of 126 miles of interstate highways and 1,298 miles of primary system highways. As of June 2013, Tazewell County has a total of 152 miles of primary roads and 520 miles of secondary roads.

Current Highway Improvements

The Commonwealth Transportation Board is placing emphasis on the rehabilitation of bridges throughout the Commonwealth and in Tazewell County. The bridges in Tazewell County were originally constructed in the 1970’s during the time that the primary routes 19 and 460 were constructed. The age and the wear of the bridges have caused a portion of these bridges to become an area of concern. The Department of Transportation is currently rehabilitating these bridges to improve their reliability and serviceability.

The recent and currently ongoing construction of State Route 696 (Big Branch) in the Falls Mills area has allowed better access to the Northern District of the county. With the projected additional traffic, this may lead to the increase of development throughout this district.More long-term regional highway improvement projects that could significantly benefit Tazewell County include the I-73 corridor (under construction) and the “Coal Fields Expressway”. Although neither project would be within Tazewell County, both would significantly improve access to the regional transportation network.

Figure 4.3

1990-2010 Methods of Transportation to Work

Tazewell Couny, Virginia, and US Statistics

	1990			2000			2010		
Statistic	**Tazewell**	**VA**	**US**	**Tazewell**	**VA**	**US**	**Tazewell**	**VA**	**US**
Car, truck, or van---drove alone	12,926	2,280,939	84,215,298	14,419	2,685,914	97,102,050	13,710	2,966,159	105,840,717
Car, truck, or van---carpooled	2,574	499,860	15,377,634	1,959	441,093	15,634,051	2,139	415,087	14,418,306
Public transportation (including taxicab)	47	125,827	6,069,589	67	124,166	6,067,703	89	164,107	6,872,730
Walked	444	97,766	4,488,886	254	80,487	3,758,982	292	90,824	3,962,070
Other means	195	39,048	1,512,842	124	40,093	1,532,219	105	53,024	2,401,488
Worked at home	294	103,418	3,406,025	318	110,067	4,184,223	284	162,788	5,759,724

U.S. Census Bureau, 1990, 2000, and 2006-2010 American Community Survey.

Planned Improvements

With the construction of State Route 696 as mentioned above, other safety projects are being planned within the Northern District. State Routes 644 and 747 are in the planning stages. These routes are improving the safety of the traveling public in these areas, and these routes also lead to the newly constructed state prison located in Pocahontas. State Route 631 in the Baptist Valley area is being planned as soon as money becomes available.

Many safety improvement projects are being planned throughout Tazewell County. The table below is a list of these projects.

Route Number	Road Name	Description	From	To	Mileage
460	Gov GC Peery Hwy	Improvement of Intersection at US Route 460 and US Route 19	Intersection at Claypool Hill	Same	---
102	Falls Mills Road	Turn Radius Increase, add northbound and southbound turn lanes	Intersection with Route 656 (Big Branch Road)	Same	---
644	Abbs Valley Road	Add right turn lane	Intersection of route 702 (Pauley Road)	Same	---
644	Abbs Valley Road	Reduce grade on southbound approach and reconstruct intersection	Intersection of Route 658 (Rosenbaum Road)	Same	---
61	Clear Fork Road	Widen existing pavement, add shoulders	Route 735 (Albany Street)	Route 662 (Cove Creek Road)	7.3 miles
91	Veterans Road	Widening of existing lanes	Route 607 (Little Tumbling Creek Road)	0.10 Miles North of Route 609 (Maiden Springs Road)	7.5 miles
609	Wardell Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 603 (College Estates Road)	VA 19 Southbound	2.4 miles
616	Bearwallow Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 621 (Stinson Ridge Road)	Intersection of Route 622 (Reynolds Ridge Road)	1.7 miles

624	Amonate Road	Reconstruction (widen lanes, add shoulders)	4.8Miles North of Route 627 (Bandy Road)	West Virginia State Line	1.4 miles
631	Baptist Valley Road	Reconstruction (widen lanes, add shoulders)	1.0 Miles East of Route 773 (Bailey Road)	Intersection of Route 635 (Mundytown Road)	6.9 miles
637	Dry Fork Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 643 (Station Hill Road)	West Virginia State Line	1.4 miles
643	Mud Fork Road	Widening of Existing Lanes	Intersection of Route 655E (Tiptop Road)	Intersection of Route 655W (Goss Road)	0.2 miles
644	Horsepen Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 16(Stoney Ridge Road)	Intersection of Route 668 (Daniels Road)	1.9 miles
651	T.R. Barrett Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 19/460 (Gov. G.C. Peery Highway)	Intersection of Route 650 (Wittens Mill Road)	1.0 miles
655	Goss Road	Reconstruction (widen lanes, add shoulders)	Intersection of Route 643 (Mud Fork Road)	Intersection of Route 644 (Abbs Valley Road)	1.8 miles
744	Triangle Road	Replace Bridge	Bluestone River		---
643	Johnsons Branch Road	Reconstruct and Repave Roadway	0.90 Miles East of Route 810 (Rooster Lane)	2.40 Miles East of Route 810 (Rooster Lane)	1.5 Miles

The large number of projects from the long range transportation plan is daunting. As such, the top five project priorities recommended are:

1. US Route 460/US Route 19 Intersection - Improvements of intersection for safety and congestion related issues.
2. Route 644 - Abbs Valley Road. Reduction of grade on southbound approach and reconstruction of intersection with State Route 658 (Rosenbaum Road)
3. Route 609 - Wardell Road. Reconstruction of roadway, including widening of lanes and addition of shoulders to roadway.
4. Route 744 - Triangle Road. Replacement of bridge over the Bluestone River.
5. Route 651 - T.R. Barrett Road. Reconstruction of roadway, including widening of lanes and addition of shoulders to roadway.

It is recommended that the Tazewell County Transportation Safety Committee continue to study and keep detailed records of hazardous locations within the county to update the priority list of safety improvements.

Needed Improvements

This section does not deal directly with specific projects, but rather with the general needs of the county, as well as safety issues. It is recommended that the Tazewell County Road Viewer Committee be responsible for implementing these recommendations and that this group report annually to the Board of Supervisors on their progress.

The first item involves the existing state road system. There are many high volume secondary roads and collectors that need to be upgraded. While a list of many of these roads is contained in the current long range transportation improvement plan, this list will be re-evaluated with the new statewide VTrans 2040. This document will be the guidance for long range transportation planning over the next 25 years. Larger construction projects will be funded and prioritized through the new House Bill 2 program and its criteria. Smaller projects and maintenance of existing roadways will be funded through the Bristol District and Lebanon Residency of VDOT.   Tazewell County needs to work with the State and Federal Government to fully fund work on these roadways.

The next item involves the existing county road (Orphan Road) system. The county's orphan road program needs to be examined and renovated to determine present needs and a method of implementation devised to make it more efficient. With the rise in material prices and the economic down turn, funding also plays a critical role in the maintenance and construction of these roadways. The Tazewell County Planning Commission has recently developed an Orphan Road Subcommittee for the intake of additional roads into the Tazewell County Orphan Road System. Along with the Tazewell County Transportation Safety Committee and the Engineering Department, this committee should be used to help prioritize the needs of the county roads for the citizens of Tazewell County.

Another area of concern is the congestion of traffic in some parts of the county. In the Claypool Hill area of Tazewell County, there is a mixture of land uses located directly along this traffic corridor. The combination of land uses and high traffic volume causes congestion which impedes the free flow of traffic in this area. While improvement of the intersection adjacent will have some impact, it will not do away with the problem altogether.

Of chief concern to the County is the development of the “Coal Fields Expressway” located within the region. The development of this expressway will cause an increase of congestion in the Claypool area with the increase of traffic volume. Tazewell County needs to work closely with the Department of Transportation to access the congestion in this area and to plan for the future impact of the “Coal Fields Expressway.” The assessment should also include the possible upgrade of U.S. 460 leading into Buchanan County and the improvement of Route 19 from the Bluefield Area to the Claypool Hill area with the construction of the I-73 Corridor already under construction. These two roadways are going to have a major impact on our current roadway system and possible development along the 460 and 19 road corridors. The future of the "Coal Fields Expressway" is somewhat in question, although new studies and recent public hearings do indicate that the project is still a possibility.

B. New Transportation Regulations

In July 2006, Virginia Department of Transportation (VDOT) instituted the Rural Transportation Planning Program. This initiative created regional transportation plans in rural areas that compliment those in the metropolitan areas of the state. By partnering with Virginia’s Planning District Commission (PDCs), the local governments are all represented and VDOT provides regional transportation assessment and improvements that best satisfy existing and future transportation needs. Though not every rural area in the state is currently served, the goal of VDOT is to provide this type of programming statewide. Through this program, each planning district will develop a Rural Long-Range Plan (RLRP) that will have a minimum of 20-years planning horizons and will address the expected impacts of population and employment growth on the transportation system. Each will develop a vision statement and be updated every five (5) years and will ultimately be used to identify regional priorities for funding. The RLRP will also provide a GIS-based long-range multimodal transportation plan that integrates highways, bicycle/pedestrian/freight, aviation, and transit systems.

The Virginia General Assembly enacted Chapter 527 within the Code of Virginia (Section 15.2-2222.1) that authorizes VDOT to coordinate state and local transportation planning beginning July 1, 2007. This new regulation gives VDOT review and comment opportunity on local Comprehensive Plans drafts and updates prior to adoption of said plans as they relate to transportation on state controlled highways. VDOT comments shall relate to plans and capacities for construction of transportation facilities affected by the proposal. Within 30 days of receipt of such proposed plan or amendment, VDOT may request a meeting between VDOT and the local planning commission or other agency to discuss the plan or amendment. VDOT will make written comments within 90 days after receipt of the plan or amendment and such comments must become part of the official record of the plan or amendment’s adoption proceedings.

Chapter 527 also impacts the review procedures for rezoning and subdivision requests before the local governing body. If either such requests are expected to have a substantial affect on transportation on state-controlled highways, the applicant must include a traffic impact statement that follows VDOT approved methodology. VDOT will review traffic impact statements and provide comments based on the local comprehensive plan, regulations and guidelines of VDOT, engineering and design considerations, any adopted regional or statewide plans, and short and long-term traffic impacts on and off site.

The Virginia General Assembly authorized VDOT to develop and implement access management standards for arterials, collectors, and local streets. These standards went into effect on July 1, 2008. These regulations are not advisory and all new entrances to the state highway system will have to meet the new VDOT requirements or permits will not be issued. These standards will be imposed by VDOT, not the local governing body, and these regulations have the force of law. The implementation of this new system is in two phases: Phase One will regulate principal arterial roads which went into effect on July 1, 2008; Phase Two will regulate minor arterials, collectors, and local streets which became effective on October 14, 2009. Additional regulatory changes were made during the 2011 Legislative session of the General Assembly to create a new category of Low Volume Commercial Entries.

These regulations currently apply only to designed highways with phasing planned to include the rest of the state highway system. Key features of these new regulations require: 1) Entrances must accommodate bicycles and pedestrians; 2) Entrances are not permitted in the functional area of an intersection or interstate interchange; 3) Private entrances are redefined to include some low volume uses that are currently classified as commercial as well as entrances to agricultural fields and public utility facilities; 4) VDOT will no longer provide on cost installation of private entrance pipes; and 5) Key changes in the Road Design Manual including new spacing requirements for commercial entrances, crossovers, and signals, and revised curb radii and clearances.

These changes in regulation are designed to provide more efficient and management development patterns throughout the state. The philosophy of these programs appear soundly in line with those of the county. Implementation of these regulations and procedures will be new work for both the county and private organizations involved in development and will undoubtedly have an impact on the cost and pattern of development within the county.

Transportation

Summary Of Needs and Opportunities

The effects of a community’s transportation system upon the land are vital. Tazewell County’s main transportation infrastructure is the road and highway system ranging from US Routes 460 and 19 to unpaved primary and secondary roads.

A transportation plan must take into consideration topography, population density and distribution, land development policies, and the overall planning objectives of a community. Additionally, how people and goods use various networks are crucial to the development of a community and the impact on the landscape and resources of the region.

The Tazewell County Airport is located two miles northwest of Claypool Hill off U.S. Route 19/460. The airport service has an important economic and transportation benefit for this tri-county region. The airport is governed by the Tazewell County Airport Authority. Commercial air service is also available at nearby Tri-City Regional Airport (Bristol, Kingsport, Johnson City). Having an airport can also help civil defense. It provides relief from natural disasters such as floods and earthquakes. It also provides service for local police, Civil Air Patrol, and National Guard activities and may be used by aircraft involved in the detection and suppression of forest fires and assessment of damages caused by fuel and chemical spills. The Tazewell County Airport has small plane capabilities, including a 4,300-foot aircraft runway and instrument landing capability for single and twin-engine general aviation uses. An AWOS Beacon upgrade was completed at the airport in 2012. Additionally, a project was completed in 2011 with FAA assistance to improve the approach angle of aircraft during takeoff and landing, primarily by excavating out a portion of an adjacent mountain.

Rail service in the region is provided by Norfolk Southern Railroad and CSX Transportation. Tazewell County is primarily served by Norfolk and Southern which has an east-west orientation within the region. Much of the coal mined within the county is shipped out of the region via rail on this line. Amtrak passenger rail services are available in Hinton, West Virginia—about on hour from Tazewell County.

Major interstate truck lines and smaller companies provide trucking services. Local bus services are available within the region, and commercial bus service is accessible to citizens of the region at stops in Abingdon, Marion, Wytheville, and Bristol.

Goal: Create and support efficient and convenient transportation network for the movement of people and goods into, out of, and within the county.

Implementation of the Goal: Provide efficient and quality public facilities and services to reasonably and adequately serve all geographic sectors of the county.

Objectives and Strategies:

1. Upgrade existing unpaved secondary roads
    - Continue to aggressively seek and utilize available state funds to upgrade unpaved roads.
    - Prioritize the unpaved road projects based on a set of criteria.

2. Improve unsafe conditions on county roads and bridges
    - Identify road sections with dangerous curves and inadequate bridges, or with pavement widths insufficient to carry existing traffic volumes, and include improvements in the six-year secondary road plan.
    - Continue to upgrade substandard subdivision streets to state standards through the Rural Addition Program.
3. Promote construction and enhancement of major transportation corridors in the county.
    - Support improvements to US 19 and 460 in order to address increasing traffic problems
    - Support the construction of a new interchange at Claypool Hill to serve the increasing amount of through traffic

4. Prevent unsafe entrances on to state roads from residential and commercial developments
    - Support the Virginia Department of Transportation new Access Management Regulations
5. Plan for future road improvement in designated growth areas in accordance with the land use plan and in coordination with proposed utility extensions
    - Encourage a pro-active role by elected officials in transportation planning
    - Continue to encourage all new structures to be setback an adequate distance from any state road right-of-way in order to promote safety and avoid problems in future road widening and utility projects
6. Establish a priority on needed maintenance improvements on existing roadways
    - Continue support of the Tazewell County Road Viewer Committee
7. Improve county Orphan Road System
    - Access the need to renovate the existing Orphan Road Policy
    - Utilize the Tazewell County Transportation Safety Committee, Tazewell County Planning Commission Orphan Roads Subcommittee, and Tazewell County Engineering Department to help prioritize the needs of the county's Orphan Roads
    - Explore means to increase funding for the Orphan Road System

Rail Transportation

Objectives and Strategies:

1. Preserve and enhance opportunities for greater industrial use of the railroad in the county
    - Identify and reserve potential industrial sites along or near the railroad
    - Seek state industrial rail access funds to construct rail siding, when necessary, to serve new or existing industrial sites
    - Study the possibility of establishing a train terminal for freight to be jointly used by area industries
2. Promote efforts to restore passenger rail service through southwestern Virginia
    - Take an active role in regional efforts to restore passenger rail service to the county
    - Assist the Town of Pocahontas in its efforts to convert the rail easement for the walking and biking rail by seeking available grant funds

Air Transportation

Objectives and Strategies:

1. Provide airport improvements to meet future needs of industry and the general public
    - Support the implementation of the master plan for the Tazewell County Airport
    - Investigate the long-range feasibility of commuter air service based on experiences of other small airports

Public Transportation

Objectives and Strategies:

1. Increase the availability of public transit services
   - Investigate the possibility of commuter transit services to transport workers from home to employment centers
2. Encourage ridesharing opportunities to assist county residents that lack transportation and reduce traffic loads in the county
   - Pursue local interest in organizing a ride sharing program among area industries to encourage carpooling
   - Study the need for "park and ride" lots in the county for commuters

Pedestrian and Bicycle Transportation

Objectives and Strategies:

1. Provide designated facilities for pedestrian and bicycle transportation
   - Plan and seek grant funds for the development of countywide systems of walking and biking trails
   - Work with the U.S. Forest Service to promote its existing recreational facilities for both local use and tourism
   - Support projects to provide safe pedestrian and bicycling access along roadways within towns and in developed areas of the county
   - Encourage development of safety regulation for bicycling on public roads, i.e. reflective gear, mirrors, helmets, and the deployment of necessary warning signs

All Terrain Vehicle (ATV) Transportation

Objectives and Strategies:

1. Provide designated facilities for ATV transportation
   - Continue working with Southwest Regional Recreation Authority to complete the existing and funded ATV Trail system
   - Continue working with Southwest Regional Recreation Authority to plan and seek grant funds for the development of additional systems of ATV trails
   - Work with the U.S. Forest Service to promote its existing recreational facilities for both local use and tourism
   - Support projects to provide safe ATV access along roadways within towns and in developed areas of the county
   - Encourage development of safety regulation for ATV riding on public roads, i.e. reflective gear, mirrors, helmets, and the deployment of necessary warning signs

V. Community Facilities and Governance

The citizens of Tazewell County have access to a myriad of services for health, welfare, and recreation throughout the county. These facilities include buildings and services that provide for the quality of life as well as the health and safety of a community. The county provides many of these services and amenities to residents, some of which are paid in part or wholly through taxes and state and federal programs. Because much of the population is centered in the towns, the services and infrastructure are also centralized in these areas. It is not fiscally responsible or feasible to provide equal services across the vast geography of the county, but the provision of services and the burden of the cost for these services must be equitably borne. All citizens benefit from a healthy economy, and vibrant communities, even when not everyone lives in the center of these communities. Likewise, town residents benefit from the protection of natural beauty and resources available in the agricultural areas. The provision and management of services and infrastructure is an important role of government and one worthy of assessment, planning, and protection for Tazewell County.

A. Community and Human Services

Tazewell County is home to a myriad of community and human service organizations and governmental programs. These services provide resources to residents and visitors ranging from emergency needs to entertainment opportunities. Although a large number of these services are available, the majority of resources provided come from three sources: Clinch Valley Community Action (CVCA), the Tazewell County Department of Social Services (TCDSS), and the Cumberland Mountain Community Services Board (CMCSB). Both Clinch Valley Community Action and the Cumberland Mountain Community Services Board provide services to the region, in addition to Tazewell County.

Some of the services provided by these groups can be broken down into categories that include:

- Advocacy Services
- After School Programs
- Alcohol and Drug Support Services
- Case Management Services
- Civic Organizations
- Community Outreach
- Counseling
- Crisis Services
- Support Services for the Deaf
- Domestic Violence Support
- Education
- Emergency Food and Shelter
- Employment Services
- Group Homes
- Head Start Program
- Housing
- Indoor Plumbing and Weatherization
- Intellectual Disability Services
- Legal Services
- Medical Services
- Mental Health Services
- Psychosocial Rehabilitation
- Recreation
- Reproductive Health
- Senior Citizen Services
- State Agencies
- Tourism
- Transportation Services

The Tazewell County Department of Social Services and Clinch Valley Community Action compile a Directory of Community Resources that list the services available within the county along with valuable contact information and general descriptions of the type of service and eligibility requirements The primary service area for both the CVCA and CMCSB is Tazewell County with additional services provided in Russell and Buchanan counties.

CVCA is locally managed and governed by a 15 member Board of Directors for the purpose of reducing poverty and promoting self-sufficiency of the poor. One-third of the board includes locally elected officials or their designees, one-third, representatives of local business or civic organizations and one-third, low income representatives. CVCA operates twelve programs with a total of 36 different projects. Over 8,000 individuals and more than 5,000 families are impacted by CVCA's services in the three-county area. The agency employs over ninety (90) full and part-time individuals throughout the three-county area. CVCA brings a cross-section of the community together to address the needs of low-income citizens.

CMCSB is one of forty (40) Community Service Boards in Virginia. Their services include mental health, substance abuse, and intellectual disability programs in the their three-county area. Many of their programs have received recognition at the local, regional, state, and national levels for innovation in their service fields. Programs impact a wide cross section of the population, from services with infants, the elderly, the mentally ill, substance abusers, and the intellectually disabled. The Service Board employs approximately 480 full time, part time, and client-employees throughout the three-county area of Tazewell, Russell and Buchanan Counties.

B. Healthcare Facilities and Services

Tazewell County is home to two hospitals: *Carilion Tazewell Community Hospital* is a 56 bed acute care facility, approved by the Joint Commission on Accreditation of Healthcare Organizations. It is a part of the *Carilion* family of hospitals. It admits roughly 1,100 patients per year, offering emergency, diagnostic, medical, and surgical care for residents. *Clinch Valley Medical Center* is a 200 bed acute care hospital offering specialty care for the heart and lungs, complete cancer care and emergency services, plus rehabilitation, skilled nursing, pediatrics, obstetrics, and advanced diagnostics. Each hospital is independently owned (investor owned) by an out of county entity and receives little or no input regarding quality and services for area citizens.

Additionally the county is home to the Tri-County Health Clinic and the Tazewell Community Clinic that provide services to low-income families at no cost as well as the Tazewell County Health Department that provides regular and emergency care to residents and visitors to the county. Bluefield

Regional Medical Center supports a local Ambulatory and Radiology Diagnostic Center/Outpatient Surgical Center in Bluefield, VA. Additionally, the County now has a private Urgent Care facility in the *MedExpress, Inc.* facility in Bluefield, VA.

Tazewell County over the past decade has had access to average and above health care services whereas the emergency transportation system has struggled, and has been disjointed and not available on a timely basis to all areas of the county. The patient emergency receiving systems at the county's two acute care hospitals has been good.

It appears county officials and area leaders have little interest or concern regarding health care as it has been provided for decades by outside corporations and entities. This lack of input has led to a lack of quality and in some cases a lack of needed services

Health care professional and physician shortages continue to be an area of concern. Southwest Virginia Community College and the Tazewell County School System (LPN) have done an excellent job educating and supplying health care employees in some disciplines of the health care field. Adequate numbers of physicians in Family Medicine, medical/surgical specialties and subspecialties continues to be a major concern. A new Registered Nurse (RN) Program at Bluefield College has been formed and will assist in meeting this shortage in part. Additionally, the proposed Dental School partnership with Bluefield College will seek to meet the shortage in technicians and dentists within the region.

Tazewell County is fortunate to have multiple nursing homes, all of which are well established with reputations of adequate patient care. Unfortunately, as the residents of the County grow older, there is a greater need for such facilities. The need for a long term care nursing facility in Tazewell County can be adequately supported. While several assisted care facilities are located in the western section of the county, there is a need for more assisted care facilities in the central and eastern sections of the county.

Generally the population of Tazewell County has been very dependent on state medical assistance for payment of health care services. The general trend is 10-15% of all health care services are paid for by Medicare or other forms of state subsidized payments.

In the past, the employment base in the Western and Northwestern districts of the county allowed commercial insurance payments for health care services to be above state and national averages. It remains to be seen if this is still the case. Commercial third party insurance coverage in the center part of the county lags, while the eastern section's is just below average. In general, Tazewell County's coal mining, gas exploration, state and local government, and manufacturing sectors have provided above average third party commercial insurance for it citizens.

Cost of health care in Tazewell County is higher than the state average. A portion of the high cost can be contributed to the very high cost of malpractice insurance for all facilities and health professionals.

Tazewell County has an aging population which creates challenges for health care providers both from a service standpoint and payment perspective.

The Virginia Health Department continues to provide many health services to the area's citizens especially low-income families with children.

One item of importance is the impact on the Affordable Care Act on the health of the area. This law allows for those without insurance to gain access to health insurance at a subsidized rate through the federal government. This plan does not replace Medicaid or Medicare, instead providing services to those of working age and their dependents. The impact of the law is currently an unknown, with very little data to substantiate its success or failure.

The development of a Hospice program for portions of the county has been well accepted and extremely beneficial.

An area that should not be overlooked is cost of burials. While most funeral homes and mortuaries are locally owned, most grave yards in Tazewell County are owned by out of county, out of state companies. These companies have no charge controls thereby creating more pressure to utilize burials in unregulated grave yards or private burial plots.

C. Veterinary Services

Another area of community health is veterinary services. Tazewell County is home to four veterinary care clinics and multiple smaller providers. Due to the rural nature of the county, many of these providers and clinics have the ability to treat not only house pets, but also larger animals, such as livestock. Veterinary services are also provided in adjacent counties, both in Virginia and West Virginia. In addition, Virginia Polytechnic Institute and State University is home to a highly lauded School of Veterinary Medicine, graduating many of the area's providers, and allowing for more complicated treatments for sick or wounded animals.

Goal: To provide assessable, affordable, health care services to the citizens of Tazewell County.

Objectives and Strategies

1. County and local officials take a more proactive role in health care. Input regarding services, costs, needs, insurance, etc, is badly needed.

2. Emphasis on physician and professional health service, personnel recruitment, and retention must be increased.

3. Recruitment from local medical schools (those within 100 mile radius) and professional schools must be undertaken. County citizen input is needed.

4. Development of more long term care facilities

5. Development of more assisted living facilities

6. Development of more outpatient services and sub-acute services. This provides lower cost alternatives to its citizens

7. Creation of a task force to study and recommend improved emergency care transportation services for the county.

8. Continued development of Hospice Program(s) to serve all county populace.

9. Continued development of healthcare needs, services, and methods of payment so needed services will be available and locally accessible for future generations.

D. Public Safety Services and Facilities

The citizens of Tazewell County have access to a myriad of services throughout the county. These facilities include buildings and services that provide for the quality of life, safety, and well-being of a community. The county provides these services and amenities to residents, which are paid through taxes and state and federal programs.

The Public Safety Department is dedicated to serving the Citizens of Tazewell County during times of county-wide crisis or single emergencies. It is the role of the Director of Public Safety to coordinate the efforts of the fire and rescue departments for the county.

1. Fire and Rescue

The county is home to three full-time fire stations: Tazewell County Fire-Rescue, the Town of Richlands Fire Department, and The Town of Tazewell Fire Department. Tazewell County Fire-Rescue was founded with the purpose of providing fire suppression, rescue and emergency medical services to Central and Western Tazewell County, Virginia. This department serves approximately 15,000 citizens for fire suppression and approximately 30,000 with emergency medical services. Several communities and towns have volunteer fire departments that support the fire suppression efforts of the county within the towns and surrounding area. Tazewell County has now also added a Fire and Rescue Director to their staff. The primary purpose for the position is to foster cooperation between all of the emergency operators, as well as plan and budget for advancements in equipment and training for all departments.

2. Tazewell County Sheriff's Department

The mission of the county Sheriff’s Department is to provide for the welfare and safety of the surrounding communities, its citizens and environment while enforcing the law and maintaining safe responsive emergency services throughout Tazewell County.

The Tazewell County Sheriff's Department has five divisions to serve the residents of the County with 24 hour a day law enforcement service:

- Patrol
- Detective
- Civil Processing
- Code Enforcement
- Court Security

There are 51 full-time sworn officers and 83 Sheriff's Department office personnel. Additionally, there are three (3) part-time employees in the courthouse. K-9 units serve with two primary purposes, narcotics cases and patrol duties. Two (2) full time K-9 animals are trained and on-duty for the County. Litter Control and Animal Control are handled by the Code Enforcement Division. Litter pickup, an excellent and active program. Two (2) employees coordinate the program through the court and patrol system. Pickup throughout the County is active five days a week. Drug issues are handled by the Drug Task Force. Three (3) full time officers are assigned to the drug task force, and this division is expanding due to the growing drug issues in Tazewell County. An Emergency Response Team has recently been organized. Ten (10) people make up this team, which are trained and prepared to respond to any emergency.

The Tazewell County Sheriff's Department has been accredited by the State of Virginia since 2008. Additionally, Sheriff Hieatt is a member of the Governor's School Safety Task Force.

It must be noted that the Tazewell County Sheriff's Department has no jurisdiction inside of town limits with the exception of animal licensing.

3. 911 Emergency Response Center

The Tazewell County 911 Emergency Response Center has been handling emergency calls since April 23, 1997. The 911 Center is comprised of 21 sworn employees under the Communications Division of the Tazewell County Sheriff's Office. The Communications Division is responsible for dispatching 25 Law Enforcement, Fire, and EMS agencies within the County and its five Incorporated Towns. In 2012, the Communications Division processed 27,766 emergency phone calls and 95,432 non-emergency phone calls. Additionally, 38,663 incident reports were created, and 911,544 radio transmissions were processed.

The Communications Division has six (6) Dispatcher workstations within the 911 Center. Each of these use state of the art technology in processing calls for assistance. This includes a touch screen radio system, emergency medical dispatch (EMD) system that provides instructions on how callers can help prior to the arrival of emergency responders, two weather monitoring systems that provide up to the minute weather conditions and forecasts, mapping software that quickly plots a caller's location, and various software applications that assist the Dispatchers in their duties. The Sherriff's Office also utilizes a Mobile Crime Scene/Command Vehicle that assists in processing crime scenes and communications support at large incidents.

The Communications Division, along with the Board of Supervisors, are implementing improvements to the communications system countywide as detailed in various studies and reports completed in recent years. These improvements area to better strengthen the communications system to handle the increasing call volumes, improve radio coverage in the valleys, and to better withstand the unique weather conditions of Tazewell County.

4. Pocahontas State Correctional Center

Pocahontas State Correctional Center (PSCC) is a medium security correctional facility (Levels II and III) within the Virginia Department of Corrections. Located on County Route 734 just outside the Town of Pocahontas, the facility is located on 950 acres of land.

Construction of this facility began in 2004, with PSCC receiving its first offenders on October 2, 2007. Maximum capacity of the center is 1,024 general population offenders. The prison population is managed in a housing unit style environment and lends itself to program participation. The institution provides a variety of program and educational opportunities, including substance abuse classes, vocational classes, and a high school completion or GED class.

The physical plan consists of four (4) offender housing units with a 256 bed capacity for each. The inside support building contains Special Housing, Property, Intake, Commissary, Medical, Food Service, DCE and Vocational, Treatment, Laundry, Offender Gymnasium, and Offender Visitation. There is also a Warehouse / Maintenance Building and the Staff Range, which is also utilized by the Tazewell County Sheriff's Department for training. Security at the facility includes a double perimeter fence (with electronic motion detection equipment) with razor wire, a video surveillance system, and two sally ports for entry and exit.

Currently PSCC has 300+ classified positions, in the following arenas: facility management, correctional security, business and accounting management, human resource management, counseling, mental health care, postal services, food services, offender records, warehouse, laundry, building and grounds, clerical support, medical, and educational services. Pocahontas State Correctional Center has been a welcome addition to the County, and enjoys a close and cooperative relationship with local citizens, businesses, and public officials.

E. Recreational Services and Facilities

Tazewell, Bluefield, and Richlands all have recreation departments that provide a variety of regional services and facility management. Tazewell County has four established parks: Cavitt's Creek, Lincolnshire, Graham, and Richlands Recreation park. All have active as well as passive recreational opportunities for residents and visitors. Since the last edition of this document in 2008, additional recreational attractions have been created. These include the portion of Virginia Route 16, denoted by the Governor of Virginia as the Back of the Dragon, a 32 mile portion of the highway in Tazewell and Smyth counties, which are major draws for motorcycle/sport car aficionados, including an annual rally that is held in Tazewell. Then there is the new "Original Pocahontas" ATV Trail, constructed by Tazewell County, and managed by Spearhead Trails, an offshoot of the Southwest Regional Recreation Authority (SRRA.) This includes over 30 miles of ATV trails in the Pocahontas area.In order to serve these new facilities, Tazewell County has also become home to several new cabin facilities which will cater to the ATV and motorcyclist/driver.

Additionally, the Clinch Valley Bioreserve is listed by Nature Conservancy among the "Last Great Places" in the WORLD's remaining ecosystems. Some of the most sensitive species of the Clinch River include 13 endangered species of freshwater mussels. As stated earlier in the plan, Tazewell County also has many natural and cultural areas that attract residents and visitors worthy of protection and enhancement such as Burke's Garden, Pioneer Park, and the Paint Lick area that is home to Native American cliff drawings. Jefferson National Forest has a rustic campground facility located along the county border and there are also several private fishing and hunting clubs throughout Tazewell County.

Community Facilities and Services

Summary of Needs and Opportunities

The citizens of Tazewell County have access to a multitude of services for health, welfare, education, and recreation throughout the county. These services not only provide for the health and safety of the community, but also improve the quality of life for the citizens. Opportunities range from amenities paid from local, state and federal programs, to the natural beauty and agricultural areas that are prevalent throughout the county. With the opportunities come challenges inherent to rural areas.

Human services agencies such as Tazewell County Department of Social Services and Clinch Valley Community Action provide resources, training, outreach, referral, and advocacy to meet the needs of those least able to provide for themselves. While no longer the highest, Tazewell County still has a high number of children in foster care, when compared to the other counties of Southwest Virginia. This is due in great part to the substance abuse problems that are prevalent. Finding an adequate number of foster homes within the county is a challenge. Some children must be housed in specialized foster care outside our area, since those homes are not always available locally.

Due to the aging population of the county, services are also provided by the Appalachian Agency for Senior Citizens. They provide a vast array of services for Tazewell County's senior citizens that aren't met by any other program. These include transportation, nutrition, day care and health care. Most of these services are on a sliding fee scale or free to the participant.

Tazewell County also has Taking Action for Special Kids (TASK) and the Center for Independent Living (CIL) to assist citizens with special needs. There are food pantry programs in each town that help those who need help providing food for their families. These agencies all provide a valuable service for those in need.

The county also offers a robust Public Safety Program. This includes fire and rescue services for all areas of the county; emergency services for any natural or man-made disaster; and law enforcement through the Tazewell County Sheriff's office, town police forces and Special Police. One challenge that faces the Public Safety Program is the terrain of the county. While providing natural beauty, it also tests the communication systems of these services. These needs have been addressed by a state communications grant to upgrade the radio systems for emergency services personnel throughout the county. A continuous effort is underway to upgrade these facilities to serve the citizens of Tazewell County.

Recreational opportunities abound in the county due to its terrain and natural beauty. The new motorsport facilities help showcase this beauty to visitors and residents of the "gearhead" persuasion. For others, the four established parks within the borders of the county will allow visitors and residents alike to enjoy the great outdoors. The Nature Conservancy listed the Clinch Valley Bioreserve among the "Last Great Places" in the world' remaining ecosystems. Some of the most sensitive species of the Clinch River include 13 endangered species of freshwater mussels. These endangered species also provide special challenges to development in the area, sometimes delaying projects because of the unique species that must be protected before construction can begin.

The county should maintain adequate library services and continue to support development of library services in the county.

Goal Statement:

To provide efficient and improved quality public facilities and services, so that to the greatest extent feasible, all geographic sectors will be adequately served.

Objectives and Strategies:

1. Every citizen should be able to obtain help to meet their basic needs from a local agency, either by direct aid or referral.

   - ☐Continue to support local and state public service agencies

2. Continue to look for recreational opportunities for the citizens, while protecting the natural beauty and endangered species.

   - ☐Continued support of hiking, biking, and walking trails throughout the county.
   - ☐Continue to encourage development of recreational lake and water activities.

3. Provide sufficient protection of the citizens with law enforcement, fire and rescue services.

4. Access the overcrowding of inmates in the regional jail

   - ☐By accessing the feasibility of acquiring the deactivated state facility located in Gratton.
   - ☐Study the feasibility of satellite sheriff offices throughout the county
   - ☐Review the locations and services provided by fire and rescue squads in the county with the goal of expansions. The inclusion of more full time positions should be studied.
   - ☐Investigate the availability of more grants to enhance these services
   - ☐Encourage expansion of community involvement such as neighborhood watch groups.

5. Continue to develop more library services to meet the needs of all county citizens

   - ☐To encourage the improvement of computer technology, such as on-line/database services.

6. Maintain a safe responsive emergency service for the citizens of Tazewell County.

   - ☐The county should consider replacement and/or up-grades on the 911 communication infrastructure
   - ☐Access the need for new 911 center
   - ☐Recommend inter-intra jurisdictional capabilities be installed
   - ☐Examine the possibility of direct radio contact from school buses to 911 dispatch center

VI. Infrastructure and Land Use

The citizens of Tazewell County have access to a myriad of services for health, welfare, education, and recreation throughout the county. These facilities include buildings, lands, and infrastructure that provide for the quality of life as well as the health and safety of a community.

A. Information Technology Infrastructure

Over the past ten years, Tazewell County has developed a Geographic Information System (GIS) which is used by the county government and staff. Within the last year, the County has made the internal system available for viewing and use for outside individuals and entities. The GIS is used to store visual and data sources related to road, house, parcel, as well as public and emergency service facility locations throughout the county. In order to fully utilize this important service, the technology infrastructure of the county must expand to include a robust internet network to transport and share this and other information technology data throughout the county and the region. The geography of the county is again a restrictive feature for this service and providing county-wide high-speed internet access is a challenge – but one worth accomplishing for the advancement and quality of life improvement for residents and businesses of the area. Projects recently completed have advanced the expansion of broadband internet lines along the primary roadways of the County, as well as providing internet access to the Tannersville area through the Tazewell County Wireless Authority.

B. Water and Sewer

Tazewell County has continued to make improvements in water and sewer service throughout the county. In 2000, only 1.1 percent of owner-occupied housing units lacked complete plumbing facilities and only one percent of rental-occupied housing units fell into this category. The public wastewater facilities in the county are located in the Towns of Tazewell, Bluefield, Richlands, Pocahontas, Amonate, and the Tazewell County Public Service Authority facility at Wardell. Plans are underway to provide public sewer to several areas along the 19/460 corridor in the Central part of the county as well as to the areas of Kents Ridge, Baptist Valley, Jewell Ridge, Greens Chapel, Red Ash, Road Ridge, Bishop, Abbs Valley, and the Forest Hills and Willow Springs subdivisions. Funding such projects requires a multi-year planning and implementation program. Currently, septic systems provide sewer to the remaining areas of the county.

Public water service is provided by Tazewell County Public Service Authority (TCPSA). Facilities include plants in Claypool Hill and Raven/Doran, along with chlorinated wells in Buskill, Teller, Boissevain and Lake View. Bluefield, Tazewell, Richlands, and Pocahontas also operate water treatment facilities. Most of the 19/460 corridor is served by public water and is the targeted area for intensive development outside the towns. Planning is underway to extend water to many areas of the county and to improve flow and quality of water sources within the current system. Private wells provide water to the remainder of the county.

C. Solid Waste Management

Tazewell County operates a county landfill near Springville on approximately 42 acres of land. It is authorized to receive non-hazardous and municipal waste. The county continues to study and consider recycling programming to reduce waste in the landfill as well as compaction efforts to reduce the size of waste entering the system. Continued assessment of these efforts is important and valuable as the maintenance and any future expansion of the landfill facility is very costly.

D. Telecommunications

In order to assist with providing telecommunications services to citizens outside of the Towns of the County, the Board of Supervisors saw fit to create the Tazewell County Wireless Authority. The first and only project completed thus far by the Authority is the supplying of wireless internet to the community of Tannersville.

Cellular towers provide cellular communications services to most of the Towns within the County, as well as to the areas along the primary corridors. Unfortunately, this leaves a large part of the County without service. Over the last five years, cellular providers have made an impact on many of these areas, but there are many mountain and valley areas without any service at all.

INFRASTRUCTURE

SUMMARY OF NEEDS AND OPPORTUNITIES

Tazewell County provides many services and amenities to the residents of Tazewell County. These services include water, sewer, solid waste removal, GIS mapping, and alternative energy. Because the growth in Tazewell County has occurred in and around the five towns located in Tazewell County, these services and amenities have been centralized in and around these areas.

Tazewell County has many natural resources which include but are not limited to coal, methane gas and wind. These natural resources need to be considered in providing alternative energy. Natural gas is provided to the Tazewell County residences that live in the Town of Bluefield and the Falls Mills area. Tazewell County should assess the possibility of converting coal bed methane to natural gas and to provide an alternative energy source for the entire county. Another alternative energy source that Tazewell County needs to assess is wind energy. With the rising energy costs, wind energy has the potential to provide supplemental energy needs. Tazewell County has identified developed property in the western and northern portions of the County which previously were home to strip mining operations. These areas, due to their location, topography, and proximity to existing heavy power transmission lines would be best suited to renewable energy projects.

Tazewell County should consider the adoption of a Wind Energy Ordinance. By the adoption of this ordinance Tazewell County can ensure the infrastructure and safety of the public being addressed during the construction of the wind turbines, while supplying an alternate energy source.

Telecommunications in Tazewell County are centered around the Towns because this is where the majority of county residents live. Tazewell County needs to assess how to provide telecommunications to the entire county. These telecommunications should include broadband, cell phone service, and cable. An area of concern with telecommunications is the need to expand the emergency communications system. Tazewell county should develop a written communication plan and provide at least 95% coverage for hand-held radios throughout the county.

Goal: To expand Tazewell County's Infrastructure to cover the entire county.

Implementation of Goal: Good planning and communication are a must to achieve all the desired elements of the infrastructure throughout the county.

Objective and Strategies

1. Increase cooperation and communication between towns and county government regarding infrastructure needs and services
2. Develop a plan to extend public water to the entire county.
   - ☐Identify any county/town connections
   - ☐Identify delivery rates at the connections
   - ☐Establish and identify available source and production capacities
   - ☐Recommendation to include towns in 604B study
   - ☐Identify funding sources that aid in the elimination of inadequate sewage disposal
3. Develop a plan to extend public sewer to the entire county
   - ☐Identify county/town and regional project connections
   - ☐Establish and identify source discharge points
   - ☐Development of agreements for use of sewer lines
   - ☐Identify capacity for treatment and line delivery
4. Provide more accessible solid waste convenience areas with adequate site locations and staffing
5. Develop a plan to extend the life of the landfill.
   - ☐Study the economical long-term development of the land fill
   - ☐Purchase a tire shredder
   - ☐Study and implement a re-cycling program

6. Develop a plan to expand the mapping network

- ☐ Expand GIS infrastructure to allow towns and other entities within county to have access to GIS system
- ☐ Coordinate water/sewer infrastructure of county/towns
- ☐ Each entity should provide information to county GIS coordinator to enhance mapping

7. Develop a plan to give Tazewell County residents an alternative energy source

- ☐ Include taps into the coal bed methane transmission lines as they are being constructed
- ☐ Pursue agreements with Coal Bed Methane companies to convert methane into natural gas for use by Tazewell County residents.
- ☐ Develop and Adopt a Wind Energy Ordinance.
- ☐ Develop and Adopt a Zoning Ordinance.

8. Develop a plan to provide telecommunications to the entire county

- ☐ Aggregation of governmental functions
- ☐ Study the establishment of county and town's consolidation of operations and maintenance facilities for broadband
- ☐ Utilize the Tazewell County Wireless Authority to develop telecommunications projects using available funds.
- ☐ Identify cell phone service deficiencies
- ☐ Identify broadband service deficiencies

D. Land Use

1. Land Use Tools

The County is tasked with managing the various land uses within the county to promote the health, safety, and welfare of all citizens. There are tools available to the county staff and governmental bodies to help with this effort. These currently include the subdivision ordinance, health and building regulations and inspections, the future land use map, as well as utility and infrastructure development and investment.

Tazewell County is home to rolling hills, fertile valleys and steep cliffs and rises. This geography is culturally and economically important to the residents and visitors of the region. The protection of these resources and of the scenic beauty of the county act as a great resource to the county's economic development. The ridgelines of the county provide the majestic views that attract tourism and encourage residential development in the county.

Tazewell County may also pursue various state and national programs that support land preservation. One such program is the Transfer/Purchase of Development Rights (TDR and PDR) program. This program is an economic and conservation tool to protect valuable farmland, forestland, and sensitive environmental areas in the county. It is a voluntary program that compensates owners of targeted property for their willingness to accept permanent deed restrictions on their land that limits future industrial, commercial, and residential development on the property. Easements are executed once fair market value is assessed and compensated to the owner of property. This compensation can come in the form of cash payment from a local government (under the PDR arm of the program) or from a private source who wishes to transfer the development rights of the targeted property to another property designated as a recipient land area (the TDR version). Once the easement is in place, the landowner still owns the land and retains all private property rights, including the opportunity to sell or give the land to heirs. The development rights are the only restricted rights under the compensated PDR/TDR easement.

The future land use map provides a visual representation of what citizens hope for development of Tazewell County. However, without land use regulations, this ideal land development pattern remains just that, a hope. Ownership of property is the driving factor behind its use and the type of development that can be expected under this system is individually motivated and driven. The county can limit the extension of infrastructure and services in targeted areas where growth is not desired. Additionally, the use of specified regulations of targeted areas of the county cannot only protect important and sensitive lands, it can also encourage the type and density of development desired in other areas of the county. The Code of Virginia allows for a zoning ordinance to be passed as a means of land use management. Tazewell County currently has no zoning outside of corporate limits of the five municipalities. These municipalities each have their own zoning ordinance, which they are responsible for overseeing and enforcing. In the future, a District or County-wide zoning ordinance could be used as a tool for land use management.

2. Environment and Land Use

Summary of needs and opportunities

The landscape provides rolling hills, fertile valleys, and the scenic vistas for both the residents and visitors of Tazewell County, but with this scenic beauty comes environmental problems. The following is a summary of items indentified that hamper the preservation of the sensitive areas and open space.

Tazewell County contains surface and ground water resources of varying quality. Even though the diverse landscape and open space available in the county supports favorable conditions for water quality, past development has had harmful impacts within parts of the county. The county has several established watersheds within its boundaries that are being negatively impacted by soil erosion, storm water runoff, and agricultural runoff that has caused our streams and rivers to be designated as "impaired streams" by the Department of Environmental Quality. The Bluestone River and the Upper Clinch River are among the rivers that have this designation. Another contributor to the streams designation is the certain construction of communities near streams that are located within the 100 year flood plain. Tazewell County has a Flood Damage Ordinance, but construction within the flood plain should be discouraged and preservation of greenways/blueways should be encouraged. In addition to the above, failing septic systems and Municipal Waste Water Treatment Plant collection systems in need of repair are contributing to the impaired stream designation and could have harmful effects on the ground water located within Tazewell County. Adequate supplies of clean surface water and potable groundwater are vital to the economic and cultural well-being of Tazewell County.

Most of the county is underlain by limestone and dolomite rocks of the Ordovician and Cambrian ages. Usually, the carbonate hardness is high, and water is classified from moderately hard to hard. Acid conditions and iron are also encountered. Springs in the areas underlain by rocks constitute an important source of groundwater that are integral parts of the water supply. Experience has shown however that the water from these formations are susceptible to contamination from surface water and may require treatment. Karst features are severe limiting factors for the building environment of commercial, industrial, and residential development in the county. Adequate availability of clean water to sustain existing development and to foster future growth is critical.

Significant land use has changed from cropland use to grazing land us. Water quality issues of sediment, nitrogen, and phosphorous continue to be problems due to livestock access to streams. Erosion from new construction sites is regulated through the county's Erosion and Sediment Control Ordinance, which requires specific measures to be taken when any land area of 10,000 square feet or more is disturbed, including single-family homes.

Tazewell County supports the concept that proper management of forested property can protect soil, water quality, and wildlife. Erosion and sediment control practices that at least adhere to guidelines outlined by the Department of Conservation and Recreation are important to maintain while conducting forestry activities.

3. Urban Forest (Green Infrastructure)

The Virginia Department of Forestry has implemented a new program focused on establishing and maintaining trees located in urban areas. This is primarily in towns, but also includes areas where there is a significant level of buildup. Federal and state grant funds are available to support these programs, whether it be for education, startup, or maintenance. The benefits of this program include positive impacts on both the community and the surrounding ecosystem.

The use of the such forests reduce average air temperatures, sequester carbon, absorb stormwater, and provide an aesthetic benefit to the areas where they are located. VDOF has indicated that they can assist in grant requests, as well as recommendations for the best planting sites and species. This program will focus on the health and function of individual trees, not just disposal of damaged or fallen trees.

Goal: Improve the environmental quality of Tazewell County by conserving its natural and cultural resources and protecting them from exploitation and misuse.

Implementation of the Goal: This can be achieved through orderly development of the county and maintenance of a balance between rural and urban land uses.

Objectives and Strategies:

1. Development and adoption of zoning ordinance for the county.

- ☐Prioritization of development and protection goals for land in the county
- ☐Assessment and accurate mapping of land values and uses
- ☐Assessment and mapping of prime agricultural lands
- ☐Assessment and mapping of environmentally sensitive areas
- ☐Assessment and mapping recreation and open spaces
- ☐Adopt Ridgeline Protection Ordinance language in to county ordinance structure

☐Evaluate state and local models to develop local ordinance for utilizing the PDR/TDR land preservation program for Tazewell County

☐Adequate funding for implementation and enforcement of codes and ordinances

2. Protection of natural and building environment from flooding and storm water runoff

☐Map watersheds, sensitive aquifers, floodplains, and steep slopes

☐Protect sensitive aquifer recharge areas in the county

☐Develop comprehensive storm water management programming

☐Develop and enforce floodplain protection programming in the county

3. Promote Regional land development and protection cooperation

☐Work with local jurisdiction to coordinate development of land between Russell/Bluefield/Mercer and Tazewell

☐Coordination with neighboring jurisdiction for natural resource protection and promotion

☐Work with local, regional, and national agencies to ensure protection of endangered species

☐Support farm services agency Conservation Reserve Easement Program (CREP)

4. Protect prime agricultural lands

☐Research Land Trust and conservation easement options and provide training and appropriate application

☐Support and promote cluster development in residential areas

☐Control development in karst agricultural areas, i.e. Burkes Garden and The Cove

☐Soil conditions may impose certain restrictions on development. When adverse soil conditions occur in combination with other prohibitive factors such as steep slope or located in an area with sinkholes, development may become completely infeasible

5. Protect the county's timberland resource from overuse and misuse while encouraging the protection of plant and animal habitats.

☐Support the enforcement of state and federal regulations on logging operations by the Virginia Department of Forestry or other responsible agencies.

- ☐Encourage local landowners to seek technical assistance from the Virginia Department of Forestry regarding the proper use of their timber resources.
- ☐Encourage the participation of local landowners in the Forest Stewardship program and "showcase" exemplary land management plans.
- ☐Encourage the establishment of Agricultural and Forestal Districts and conservation easements as voluntary measures by landowners to protect their forestlands

VII. Education and Training

The citizens of Tazewell County have access to a myriad of services for health, welfare, education, and recreation throughout the county. These facilities include buildings, lands, and infrastructure that provide for the quality of life as well as the health and safety of a community.

Tazewell County residents also have a wide and rich variety of learning and training opportunities within easy grasp and there is strong commitment to the maintenance and advancement of the facilities and resources required to provide this important lifelong learning environment. The county is home to 16 public school facilities, Southwest Virginia Community College, Bluefield College, and a satellite campus program at the community college for Old Dominion University. The county oversees and funds the provision of public educational opportunities for kindergarten through 12th grades. Higher educational opportunities are also available from several institutions within easy driving distance of the county. Due to advances in technology, there are many on-line learning and training opportunities that citizens and businesses can take advantage of without leaving their homes or places of work.

A. Public Education

The Tazewell County School Division, in partnership with parents and the community, is committed to preparing students to become productive members of society by recognizing that each student is unique and possesses the potential to learn.

Figure 7.1

2013 - 2014 Tazewell County Public School Enrollment

School	Enrollment	Grades Offered
Graham High	553	9-12 grades
Richlands High	711	9-12 grades
Tazewell High	597	9-12 grades
Graham Middle	436	6-8 grades
Richlands Middle	567	6-8 grades
Tazewell Middle	465	6-8 grades
Abb's Valley Elementary	143	PK-5 grades
Cedar Bluff Elementary	438	K-5 grades
Dudley Primary	273	PK-2 grades
Graham Intermediate	282	3-5 grades
North Tazewell Elementary	302	PK-5 grades
Raven Elementary	201	PK-5 grades
Richlands Elementary	553	PK-5 grades
Springville Elementary	148	PK-5 grades
Tazewell Elementary	507	PK-5 grades
Tazewell Co. Career & Tech Center	NA*	High school – adult

Tazewell County Public Schools, August 2013

****The Center does not have separate enrollment***

The Tazewell County Career and Technical Center is a vocational center located on the grounds of Tazewell High School but is operated as a separate school with its own administration. It offers occupational training to all the high schools in Tazewell County. In addition to the trades offered during the school day and week, there are four trade extension classes in operation two nights per week. Because of the request for additional vocational offerings in Tazewell County, the Tazewell County Vocational Center has plans for an expansion to their building to include four more trade classes. Evening Classes include Welding and Carpentry.

Figure 7.2

2013 - 2014 Tazewell County Vocational School Enrollment

Class	Enrollment - AM	Enrollment - PM	Total
Auto Body Technician	20	16	36
Building Trades	9	11	20
Diesel Technician	18	11	29
Carpentry	17	12	29
Small Engine Technician	14	17	31
Cosmetology	46	23	69
Nail Technician		6	6
Computer Aided Drafting	13	10	23
Auto Service Technician	19	20	39
Welding	13	16	29
Masonry	14	16	30
Nursing (2nd Year)		14	14
Total Enrollment	**183**	**172**	**355**

Figure 7.3

Tazewell County High School SOL Scores 2011-2013

	% Pass Reading			% Pass Writing			% Pass Algebra I			% Pass Geometry			% Pass Algebra II		
	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013
Tazewell	94	93	87	93	93	82	90	66	60	81	64	68	91	65	71
Buchanan	94	90	86	89	93	80	97	80	75	85	68	75	98	61	89
Dickenson	93	90	82	88	87	84	94	70	52	93	72	78	84	53	66
Russell	95	97	87	91	95	81	93	65	60	87	80	76	85	48	69
Virginia	94	94	89	93	93	87	94	75	76	87	74	76	91	69	76

Virginia School Report Card, Virginia Department of Education, 2013.

	% Pass Biology			% Pass Chemistry			% Pass Earth Science			% Pass VA/US History			% Pass World Geography		
	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013	2010 - 2011	2011 - 2012	2012 - 2013
Tazewell	89	91	72	97	93	93	92	92	89	84	82	81	81	78	86
Buchanan	91	94	74	89	97	82	87	93	81	82	88	79	84	89	85
Dickenson	89	90	76	97	100	82	87	89	77	80	88	90	96	87	81
Russell	92	95	80	85	99	98	92	92	80	79	83	81	79	78	73
Virginia	90	92	83	93	93	86	89	90	83	83	85	86	85	85	86

Virginia School Report Card, Virginia Department of Education, 2013.

The Virginia Department of Education maintains school report cards on each public school within the Commonwealth. There is extensive data about curriculum, student performance and overall school assessments found in these reports that are accessible on-line through the Tazewell County Public Schools website, www.tazewell.k12.va.us. Figure 5.2 shows the Tazewell County High School Standards of Learning scores for the 2011-2013 school years. Tazewell County is meeting state standards in all categories of assessment. In addition to this state assessment process, the county developed a Comprehensive Plan Education Committee in January of 2006 that developed an extensive list of goals, objectives and strategies for implementation around issues and future visions of the educational resources for the county. This committee was made up of public educators and administrators, higher education personnel as well as social, community and economic development representatives from across the county and region. The primary targets for improvement and investment were career awareness and exploration, career readiness, emotional wellness, substance abuse prevention, and nutrition and physical well-being. Specific goals and strategies for addressing these needs can be found in the goal development section of this chapter.

Figure 7.4

2010-2012 Cohort Graduation Rates for All Students

Cumberland Plateau Planning District

Division	**2010**	**2011**	**2012**
Tazewell	69%	73%	74%
Buchanan	77%	81%	76%
Dickenson	79%	81%	81%
Russell	77%	81%	81%
Virginia	82%	84%	83%

Virginia School Report Card,

Virginia Department of Education, 2013. (Federal Graduation Indicator)

Tazewell County Public Schools strive to meet the changing needs of students and the communities that are home to the school facilities. Figure 5.3 indicates that Tazewell County had the lowest graduation rate in the Planning District in 2011-2013. Addressing the barriers for improving graduation rates in Tazewell County is a critical need in the school system. Teachers and administrators continually explore ways to address needs of students and support the development and quality of life desires of the community at large. The core beliefs of the public educational system in the county are reflected in the mission statement: The Tazewell County School Division, in partnership with parents and the community, is committed to preparing students to become productive members of society by recognizing that each student is unique and possesses the potential to learn.

B. Higher Education

The Commonwealth of Virginia offers many higher educational opportunities throughout the state and Tazewell County benefits from the location of a valuable and community-integrated community college (SVCC). Additionally, Old Dominion University offers course work through the SVCC curriculum. Bluefield is home to an excellent private Baptist college, Bluefield College. Many graduating high school students from Tazewell County choose to attend these local institutions of higher learning as do other, non-traditional students and participants. The College Choices table (Figure 6.4) shows the distribution of Tazewell County residents at schools in Virginia.

Figure 7.5

Tazewell County College Enrollment Fall 2010

Virginia Institution	Number of Students Enrolled	Percent of Total Students attending VA Institutions
Southwest VA Community College	1,314	68.3
Virginia Tech	87	4.5
Radford University	85	4.4
Bluefield College	82	4.3
University of Virginia at Wise	53	2.8
Wytheville Community College	50	2.6
Liberty University	43	2.2
Old Dominion University	34	1.8
Virginia Commonwealth University	29	1.5
Emory & Henry College	21	1.1
University of Virginia	16	0.8
Other VA Community Colleges	31	1.6
Other VA 4-year College/University	71	3.7

VCC Institution Research Office, July 2011

C. Continuing Education

Offering opportunities for training and personal growth are important aspects of the quality of life for Tazewell County residents. SVCC and Bluefield College offer many opportunities for job training and personal development and advancement to adult learners in the county. Additionally, the community facilities made available to residents through the public school systems create a myriad of opportunities for learning and recreation. Maintaining these facilities for full community enjoyment is an important aspect of the county government. The cooperative and efficient use of these community assets is critical to getting the most benefit for all citizens from these significant facility investments.

In order to maintain the highest quality facilities that benefit the greatest number of citizens, the county government and staff must assess investment in the best cost-benefit scenarios. As with all community facilities, the initial investments are very large and the maintenance is an annual commitment that can often be costly. Creating facilities in areas that are accessible and convenient to a broad range of citizens is necessary to meet the needs of residents and create the highest cost-benefit situation.

All residents are contributors to the construction and maintenance of community facilities, the largest and most predominant of which are schools. Neighborhood schools can be the anchor to a community and create opportunities for citizen engagement and learning at all levels. Multi-generational access to these facilities are not only cost effective, they are community-building opportunities. Learning is a lifelong adventure and Tazewell County supports that pursuit with programming and facilities for all residents.

Figure 7.6

Education Attainment Comparison for Tazewell County

	1990			2000			2010			2012		
Statistic	**Tazewell**	**VA**	**U.S.**	**Tazewell**	**VA**	**U.S.**	**Tazewell**	**VA**	**U.S.**	**Tazewell**	**VA**	**U.S.**
Persons 25 & up	30,096	3,974,814	158,868,436	31,291	4,666,574	182,211,639	32,115	5,208,536	199,726,659	32,328	5,433,053	206,597,203
Less than 9th grade	7,533	443,668	16,502,211	5,227	338,184	13,755,477	3,833	286,383	12,435,227	3,488	278,157	12,299,194
9th-12th grade, no diploma	5,316	543,535	22,841,507	4,934	526,426	21,960,148	4,017	438,680	17,463,256	3,784	406,591	16,728,246
High school graduate	8,559	1,059,199	47,642,763	10,171	1,212,463	52,168,981	10,645	1,353,923	57,903,353	11,277	1,382,317	58,410,105
College, no degree	4,306	736,007	29,779,777	5,588	951,700	38,351,595	6,512	1,020,903	41,175,904	7,142	1,090,832	43,925,780
Associate degree	1,645	219,511	9,791,925	1,928	262,813	11,512,833	2,501	347,485	15,021,920	2,941	377,135	16,069,996
Bachelor's degree	1,927	612,679	20,832,567	2,280	835,011	28,317,792	3,243	1,038,321	35,148,428	2,600	1,106,898	37,090,877
Grad or prof. degree	810	360,215	11,477,686	1,163	539,977	16,144,813	1,364	722,841	20,578,571	1,096	791,123	22,073,005
% high school grad or higher	57.30%	75.10%	75.20%	67.50%	81.50%	80.40%	75.60%	86.10%	85.00%	77.50%	87.40%	85.90%
% bachelor's degree or higher	9.10%	24.50%	20.30%	11.00%	29.50%	24.40%	14.30%	33.80%	27.90%	11.40%	34.90%	28.60%

U.S. Census Bureau, 1990 aud 2000, U.S. Census Bureau, American Community Survey 2006-2010 5 Year Estimate, 2010-2012 3 Year Estimate

Educational attainment has long been a measure of the growth potential and diversity of a community. Tazewell County has shown an increase in all categories of educational attainment from 1990 to 2012 (Figure 6.5). In today's dynamic workforce, educational advancement is critical for success and Tazewell County residents are mirroring state and national trends. Though still lagging in actual percentage numbers of people with advanced education compared to state and national averages, Tazewell County actually grew at a higher rate than the state and federal averages in several categories (significantly in the category of high school grad or higher).

Much progress has been made in Tazewell County Schools yet problems remain. The county developed a comprehensive Education Plan to address needed improvements and investments in career awareness, emotional wellness, substance abuse prevention and nutrition and physical well-being. Tazewell County's high drop-out rate also highlights the need for innovative strategies to meet the needs of at risk students. It is also important that school administrators closely evaluate teacher performance before acquiring tenure.

Goal

To promote the advancement of quality public education by providing opportunities to increase education and training to ensure the highest educational standards and to improve the quality of life for all residents of Tazewell County.

Objectives and Strategies

1. To promote nutrition and physical well-being

Engage students, parents, teachers, food services

- ☐professionals and other interested community members in developing, implementing, monitoring, and reviewing division wide nutrition and physical activity policies.
- ☐Support community based fitness programs for children in town fitness centers.
- ☐All schools meet the nutrition recommendations of the U.S. dietary guidelines for Americans
- ☐Nutrition should be integrated into the health and education and core curricular areas.

2. To work with related agencies to prevent substance abuse

- ☐Develop community wide information dissemination for substance abuse prevention
- ☐Expand the life skills program for children
- ☐Implement a program to promote a healthy lifestyle for students

3. To promote emotional wellness

- ☐Implement a zero tolerance for bullying/harassment
- ☐Instruct children on internet safety
- ☐Develop strategies to inform and counsel students in coping with divorce, abusive parents, grief and custody battles.
- ☐Increase parenting classes
- ☐Promote early mental health screenings

4. To continue to implement programs concerning career awareness and readiness

- ☐Encourage a study to examine current and future career and technical needs in Tazewell County
- ☐Develop a long range plan for workforce development
- ☐Work with area colleges and other state and local agencies in identifying needs and opportunities for future careers.
- ☐Focus on good work habits at an early age such as regular attendance using various incentives.
- ☐Design and promote training and retraining programs.
- ☐Encourage more classes in consumer economics
- ☐Offer more high-tech training

5. To increase the percentage of adults in the county who are high school graduates or (equivalent)

- ☐Continue to offer opportunities in adult education
- ☐Promote programs such as “ race to GED,” scale, continuing education, and higher education.
- ☐Develop industrial skills enhancements training and encourage business industries to provide employees the opportunity for basic skill training.
- ☐Assist the Tazewell County School Board and other higher education institutions.

6. To provide a comfortable atmosphere for learning

- ☐Install air conditioning in all Tazewell County Schools
- ☐Employ teachers who are cognizant to students needs.
- ☐Provide alternative education for disruptive students

7. To reduce the dropout rate

- ☐Address the issue of teen pregnancy
- ☐Identify at-risk students and prepare an intensive program that enhances their self-esteem and feeling of success.
- ☐Consider alternative education in the elementary grades
- ☐Provide employment training opportunities that reflect student interests and strengths.

8. To encourage the growth of gravity and affordable childcare programs

- ☐Increase the number of childcare centers to serve working mothers
- ☐Instructive before and after school programs etc. latch-key
- ☐Place emphasis on preparing toddlers for kindergarten

9. To provide parenting classes if possible to parents of children 1-4 years of age.

- ☐Develop a program to provide opportunities for families to learn about the resources within the community
- ☐Continue to encourage and offer opportunities for parents to become actively involved in the education of their children.

VII. Economy and Culture

Every community has a unique history. Though Tazewell County shares historic references with other westward expansion communities along the eastern coast of the United States, there are many attributes and influences that created this distinct community of work and culture. This area is connected to the geography both from economic connections of the natural resource bases that support agriculture, mining, and timber to the natural scenic beauty area reflected.

The core values held by Tazewell County citizens include the preservation of historic resources, a strong sense of community and family, and enjoyment of the environment. These values are evident by the local support of community associations, local chapters of the Chamber of Commerce, growth of historical societies, and preservation of cultural and historic sites and buildings.

A. Development and Structures

Prior to 1880, Tazewell County's economy was based in agriculture. Crop production and livestock were the basis for trade and wealth development along with a few trading post communities in the northern and western sectors of the county. With the discovery of rich coal seams near Pocahontas in the early 1880s, the economy took a major shift toward mining and coal-related industrial development. Boomtowns were literally erected overnight and although few of these coal-development based communities survive today, both Richlands and Pocahontas owe their existence to this era in the county's history. The national decline in both the mining and agriculture economies has been felt here in Tazewell County. Though not as dramatic as the economic shift of the 1880s, Tazewell County faces challenges and opportunities in this time of economic change and redirection. Industry and manufacturing related to the natural resources of the county remain important, but are not the growth industries of this century.

The Tazewell County economic development mission is to aggressively seek economic opportunities that enhance the business and residential communities of the county. The Tazewell County Industrial Development Authority (IDA) and the Tazewell County Board of Supervisors are dedicated to building and supporting a strong economic base that enhances the quality of life for citizens of the county. Realizing the importance of a diversified economic base, Tazewell County has a progressive labor environment and is positioned among the country's northern most right-to-work counties. Continuing to work toward closer parity with the state's average income is an important goal and maintaining pace with income increases is absolutely necessary to ensure Tazewell County's residents gain economic opportunities thus keeping them in the county.

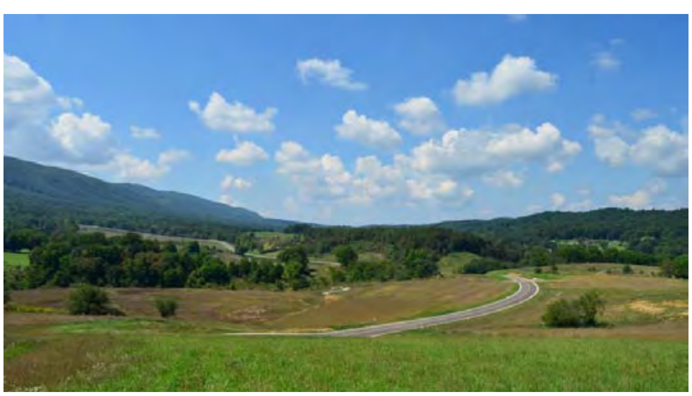
The county supports strong and accessible educational and medical systems, low electric utility rates, and below average construction costs. Tazewell County has five successful existing industrial parks strategically located along U.S. 19/460 with a new development, The Bluestone, having been recently completed in the eastern section of Tazewell County.

Tazewell County's community organizations, museums and libraries contribute greatly to the way of life in the county. The county's lead organization for promotion of cultural arts is the Citizens for the Arts (CART) whose purpose is to provide a variety of cultural experiences and opportunities to area citizens and visitors. The Historic Crab Orchard Museum and Pioneer Park strive to preserve the history of the past. An active Arts-In-Education program provides the area schools with artist residencies in the performance fields that include art, music, and drama.

B. Current Industry and Development

For more than 100 years, the basis employment of Tazewell County has been coal mining or mining related industries. Basis employment, by its nature, is found in industries that sell the majority of their goods and services outside of the area of the industry. Because this employer is also based in resource extraction, Tazewell County cannot rebuild the source of this employment nor has it benefited from the value-added industries related to the coal industry. This traditional economic driver has been underutilized for the county as the raw mineral extraction is the primary economy of the region while the value-added processing and retailing of this resource is sourced outside of Tazewell County. Figure 8.1 shows the major employers in Tazewell County today. These businesses, though not always offering as high a wage as the mineral extraction industry, are building the new economy base in the county. The chart shows the major employers to largely be governmental and healthcare facilities, both with living wage opportunities for employees. Retail also holds a sizable share of the employers in the county and with their relatively low wage job opportunities, this growing segment merits notice and assessment from the view of long term sustainability.

New expansions into tourism, primarily recreation related will affect the county positively. Both the Back of the Dragon and the "Original Pocahontas" ATV trail will boost the number of visitors who come to stay and play in our region. As time continues, this industry will play a greater part in the overall economics of the area, with lodging, restaurants, and other connected businesses.



The Bluestone Technology Center will also play a vital role in the economic success of the County in the future.

Figure 8.1

50 Largest Employers in Tazewell County, 2013

Rank	Company	Ownership Type	Number of Employees
1	Tazewell County School Board	Local Government	1000 and over
2	Wal-Mart	Private	500 to 999
3	Clinch Valley Medical Center	Private	500 to 999
4	Cumberland Mountain Community Services	Local Government	250 to 499
5	Southwest Virginia Community College	State Government	250 to 499
6	Pocahontas State Correctional Center	State Government	250 to 499
7	Lowe's Home Centers, Inc.	Private	100 to 249
8	Tazewell County, Virginia	Local Government	100 to 249
9	McDonald's	Private	100 to 249
10	First Community Bank	Private	100 to 249
11	Food City	Private	100 to 249
12	Magic Mart	Private	100 to 249
13	Bluefield College	Private	100 to 249
14	Joy Technologies	Private	100 to 249
15	Heritage Hall	Private	100 to 249
16	Appalachian Agency for Senior Citizens	Private	100 to 249
17	Town of Bluefield	Local Government	100 to 249
18	Jenmar Corporation of Virginia	Private	100 to 249
19	Knox Creek Coal	Private	100 to 249
20	Town of Richlands	Local Government	100 to 249
21	Pyott Boone Electronics, Inc.	Private	100 to 249

22	Tazewell Community Hospital	Private	100 to 249
23	Pemco Corporation	Private	100 to 249
24	Spandeck, Inc.	Private	100 to 249
25	Food Lion	Private	100 to 249
26	Aramark Services	Private	100 to 249
27	Westwood Medical Park Operations, LLC	Private	100 to 249
28	Cardno MM&A	Private	100 to 249
29	Grants Supermarket	Private	50 to 99
30	K.S. & J. Roustabout	Private	50 to 99
31	Hardee's	Private	50 to 99
32	Tammy Bostic	Private	50 to 99
33	Wendy's	Private	50 to 99
34	Clinch River Forest Products, Inc.	Private	50 to 99
35	Justice Low Seam Mining, Inc.	Private	50 to 99
36	Clinch Valley Community Action	Private	50 to 99
37	Clinch Valley Physicians, LLC	Private	50 to 99
38	Emats, Inc.	Private	50 to 99
39	Ramey Chevrolet, Inc.	Private	50 to 99
40	Tazewell County Board of Social Services	Local Government	50 to 99
41	Contemporary Builders	Private	50 to 99
42	Tidewater Wholesale Grocery	Private	50 to 99
43	Pounding Mill Quarry Corporation	Private	50 to 99
44	CNX Gas Company	Private	50 to 99
45	Town of Tazewell	Local Government	50 to 99
46	Omega Surface Mining, LLC	Private	50 to 99
47	Kwik Kafe Vending Company	Private	50 to 99

48	United States Postal Service	Federal Government	50 to 99
49	Family Preservation Services	Private	50 to 99
50	Limestone Dust Corporation	Private	50 to 99

Virginia Employment Commission, Quarterly Census of Employment and Wages,

2nd Quarter (April, May, June) 2014.

As shown in Figure 8.2 on the next page, Tazewell County's average weekly wage show the powerful incentive for supporting the mining industry. Wage rates, though lower than the average in the region, are still significantly higher for natural resources and mining than any other category. The Goods-Producing Domain has also be a strong growth category for wages in Tazewell County and the region. The county and region have lost the most ground in the professional and business services with the average wage for the county at less than half of the average for the state for many of those categories..

Figure 8.2

Annual Average Weekly Wage ($)

Tazewell County, CPPDC, and Virginia

Industry	Tazewell County	Cumberland Plateau Planning District	Commonwealth of Virginia
Agriculture, Forestry, Fishing and Hunting	611	695	586
Mining, Quarrying, and Oil and Gas Extraction	1,188	1,463	1,297
Utilities		1,704	1,838
Construction	810	862	934
Manufacturing	806	928	1054
Wholesale Trade	713	821	1346
Retail Trade	410	406	516
Transportation and Warehousing	504	673	924
Information	793	680	1,583
Finance and Insurance	652	740	1,447
Real Estate, Rental and Leasing	481	541	897
Professional, Scientific, and Technical Services	746	791	1,792
Management of Companies and Enterprises	919	1,008	2,026
Administrative, Support, and Waste Management	452	485	706
Educational Services		606	789
Health Care and Social Assistance	671	735	855
Arts, Entertainment, and Recreation	270	301	427
Accommodation and Food Services	262	254	333
Other Services (except Public Administration)	645	665	751
Federal Government	704	817	1,594
State Government	629	691	856
Local Government	551	565	818

Virginia Employment Commission: Quarterly Census of Employment and Wages, 2nd Quarter 2014,4th Quarter 2013

1. Mining and Related Industries

The county benefited in many ways from the mining industry. Whole communities were developed in response to the abundant natural resource opportunities found in this area, and several industries continue to employ residents of Tazewell County and the surrounding region that support and enhance the mining opportunities in the area. However, the dependence on this single source of economic development has had dramatic costs to residents and the overall development of the county. Dependence on a basic industry makes the economy of the county highly susceptible to changes in that base industry, and Tazewell County has felt the impact of the "boom-bust" cycles of the mining industry.

The national demand for coal decreased in the 1960s as oil and natural gas began to compete with the coal market for home and industrial heating. Greater mechanization has allowed for higher production with fewer workers in the mines, thus reducing the employment opportunities in the county. Coal had a short-lived resurgence in the 1970s, but this was followed by greater environmental regulations of the industries in the late 1970s that had the greatest impact on smaller mining companies, the very type operating in Tazewell County. Profit margins were shrinking for these firms due to the higher costs of doing business and as the overall market for coal dropped again in the 1980s, the unemployment rates in Tazewell County skyrocketed.

The recent Marcellus Shale natural gas boom has impacted the price of coal negatively in the region, leading many mines to close, or to drastically decrease production rates.

Figure 8.3

Coal Production and Number of Mines, 2013 and 2012

(Thousand Short Tons)

	Underground		Surface		Total	
	# of Mines	Production	# of Mines	Production	# of Mines	Production
Tazewell	2	481	2	767	4	1,248
Buchanan	18	6,305	9	1,390	27	7,695
Dickenson	11	3,032	6	510	17	3,543
Russell	4	298	2	100	6	398
Virginia	48	12,190	34	4,429	82	16,619

Energy Information Administration: Annual Coal Report 2013

Current mining production is highlighted in Figure 8.3 with total tonnage for the region broken down by county. As the chart shows, Tazewell and Russell County have the fewest mines in operation as well as smallest production capacity in the region. Because the average annual wage in the mining industry is still one of the highest, there is still strong commitment to supporting this industry within the county and the region, even with the downturn in production and jobs. Due to the need for alternative energy sources, it is projected that coal production will maintain its current production and possibly increase over the next several years as natural gas prices level off . However, the need for diversification of the economy is a reality particularly for the county and even the region.

Methane gas extraction is a growing industry in Tazewell County. While not located in the larger gas fields, natural gas extraction and coal gasification are growing industries in Tazewell County and merit close observation for development and economic enhancement opportunities.

2. Healthcare and Service Industries

The county and surrounding local governmental partners spent the last two decades developing strategies and incentive programs to build new industry and job opportunities and to diversify the economic basis of the region. As was the national trend, the healthcare and service industries of Tazewell County have seen growth (Figure 8.1). However, the wages related to these industries are regularly lower than the traditional manufacturing wages associated with the mining and mineral extraction industries but continues to provide a strong employment base for the county. With the development of the Bluestone Technology Park, additional emergency, fire, and rescue services are needed in this area and are likely to be developed to include but not limited to: EMS, Fire and Rescue, Medical Air Evacuation, and general medical facilities.

3. Agriculture and Agribusiness

Agriculture is an important piece of Tazewell County's economic puzzle. Though the number of farms and acreage of land committed to agribusiness is shrinking in the county, the size of farms is growing. This may indicate a more corporate approach to this sector of the economy and also may be due to the larger number of livestock farmers vs. crop farmers because of the grazing needs of animals.

The number of farms in Tazewell County as well as nationwide is declining as shown in Figure 6.4. The average size and value has increased, but the overall number of acres in active farming is shrinking in Tazewell County according to the US Census. There has been a significant increase in the amount of governmental subsidies to farmers in the county. These can be directly attributed to the current tobacco subsidy programming which is not likely to be long term, making the continuation of crop farming possibly difficult to achieve profitability in the future.

Figure 8.4

Agriculture in Tazewell County

Farming Highlights	2012	2007	2002
Number of Farms	584	576	551
Land in Agriculture (acres)	150,181	153,677	138,977
Average size of farm (acres)	257	267	252
Average Value of Production per farm	$46,268	$37,308	$32,182
Average farm production expense	$45,710	$34,788	$29,524
Government Payments	$572,000	$137,000	$252,000

US Census of Agriculture, 2012 and 2007

Tazewell County has been noted as "The County where bluegrass grows to the top of the mountains." This is due to the vast under layer of limestone and may explain why the county is well known for its cattle industry. Grazing is a significant activity of the agriculture types found in Tazewell County. Figure 8.5 shows that cattle, sheep, and goats are the top livestock commodities for the county. Hay and related crops are the top items of acreage use in the county though the actual yield per acre would give a better representation of crop production in the crop categories. Population growth in Tazewell County will continue to remove agricultural land from production. Continued planning must take place to protect and conserve the counties most productive areas. Burkes Garden and the Cove must be off limits for commercial, industrial, and large housing developments. These areas are sensitive karst areas and the Cove serves as one of the primary watersheds for the county.

Figure 8.5

Agriculture Types and Rank in Tazewell County

Commodity	Quantity	State Rank	U.S. Rank
Top Livestock Inventory Items (number)			
Cattle and calves	37,199	15	762
Sheep and lambs	4,115	4	210
Layers	2,121	34	1,254
Goats, all	1,310	8	387
Horse and ponies	1,292	22	874
Top Crop Items (acres)			
Forage-land used for all hay and haylage, grass silage, and greenchop	21,437	23	900
Corn for silage	926	30	1,160
Corn for grain	(D)	78	(D)
Short-rotation woody crops	(D)	6	(D)
Vegetables harvested, all	39	57	1,746

U.S. Census of Agriculture, 2012.

(D) Cannot be disclosed.

Ranked items among the 98 state counties and 3,078 U.S. Counties, 2012.

Timber is another economic asset within Tazewell County. The wood products industry has struggled in recent years, however the natural resources within the county make this potential economic driver worthy of note and assessment today and for the future.

It is clear from Figure 8.6 that Dickenson County within the planning district is the only county still showing true economic benefit from the wood products industry. As with the coal industry, this economic driver is natural resources based and often does not return equal benefit for the level of long-term impact assessed to the community. Should Tazewell County pursue a renewal of development within this area, it will be crucial to create businesses that enhance the return on investment within the wood products industry so the citizens of the county can benefit from the extraction of these valuable resources.

Figure 8.6

Wood Product and Type by Thousand Cubic Feet

	All products		Saw logs		Veneer logs		Pulpwood*		Composite panels		Other industrial	
County	**Soft**	**Hard**	**Soft**	**Hard**	**Soft**	**Hard**	**Soft**	**Hard**	**Soft**	**Hard**	**Soft**	**Hard**
Buchanan	95	877	0	463	0	0	0	80	0	18	93	134
Dickenson	15	9,165	0	532	0	90	15	6,643	0	0	0	0
Russell	0	1,000	0	532	0	0	0	261	0	0	0	0
Tazewell	615	3,009	229	1,136	0	0	1	638	1	78	370	533

US Department of Agriculture, Forest Service, Resources Planning Act Timber Product Output Report, 2007.

****Includes roundwood delivered to nonpulp mills, then chipped and sold to pulp mills (138,000 cubic feet in 2003)***

C. Emerging Technology and Development

High speed fiber optic cabling has been deployed in a backbone fashion to provide access to this utility for opportunities that are expected in the region. Higher wages and stable business opportunities will come with these ventures thus preparations are necessary for this to occur. Information Technology (IT) industries have located in neighboring communities, and Tazewell is working to position itself to build on potential expansions and networked business.

An important initiative in that realm is the development of the Bluestone Regional Business and Technology Park overlooking the Bluestone River off Route 460. The master plan for this park includes office buildings, a hotel and conference center, retail shops, restaurants, a golf course, seasonal lodges, and residential units. As a result, high technology workers will work, play, and live in a well-planned and developed area. The local community will also benefit from the recreational, business, and tax-generating resources this park will offer.

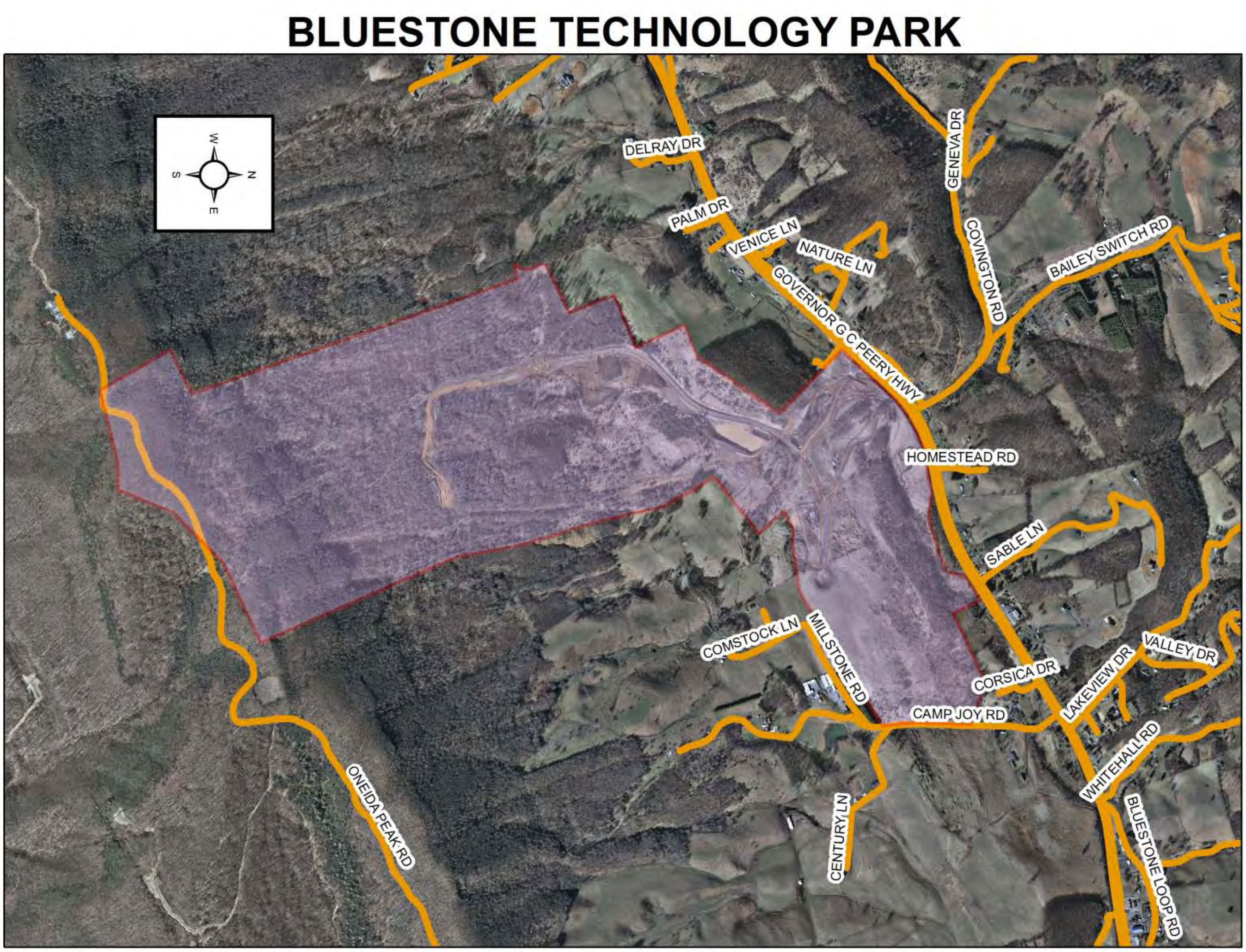
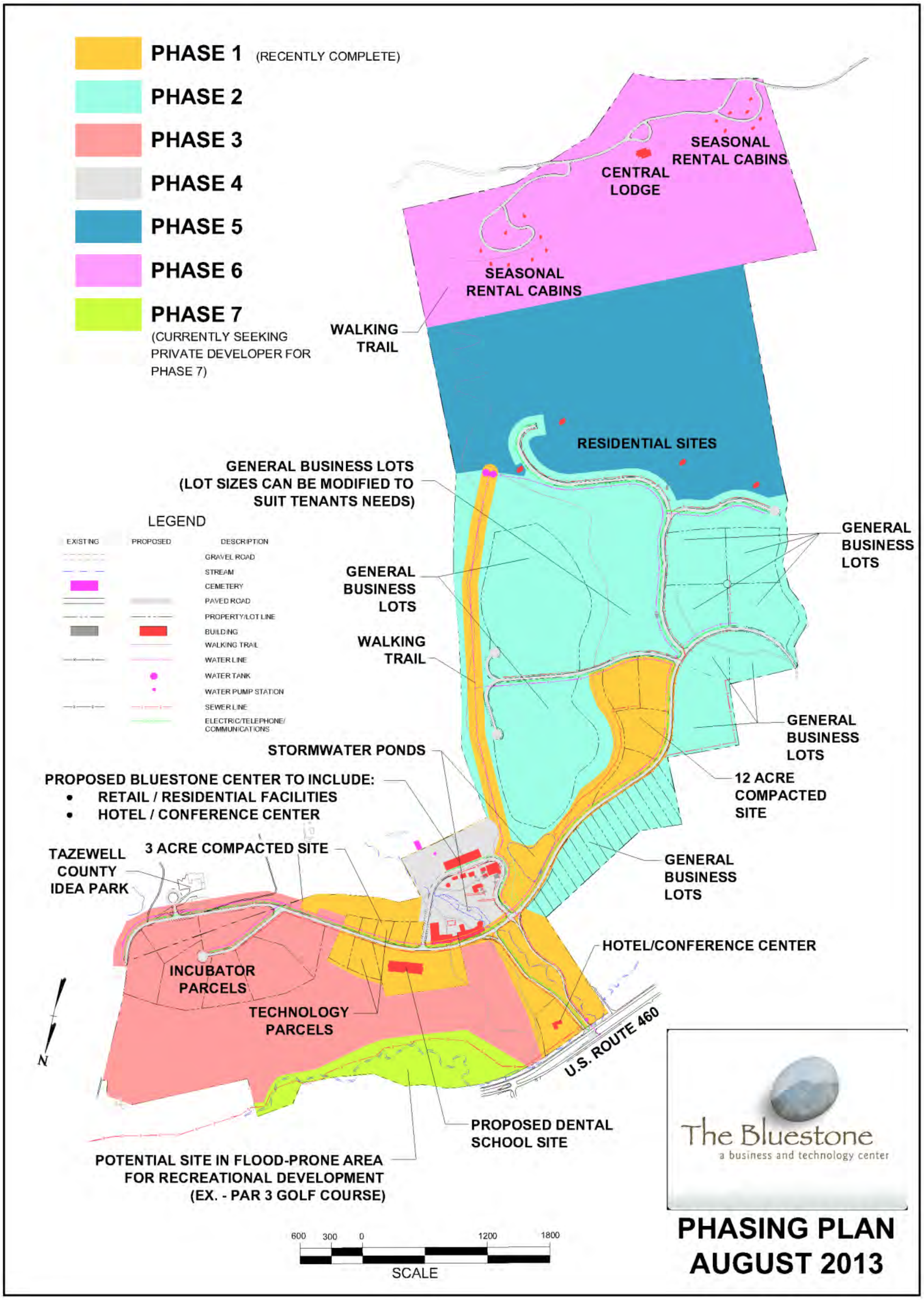


Figure 8.7

Site Plan Map of Bluestone



The Economy

The Vision

The vision for Tazewell County is for sustained economic growth that does not impair or diminish the rural character of the county. The economy would be characterized by abundant jobs that offer above state average wages, salaries and benefits resulting in very low unemployment, minimal public assistance and higher than average SAT/SOL scores. The economic development efforts of the county are focused on advanced countywide water, sewer and telecommunications infrastructure system, aggressive business recruitment and tourism development programs, as well as active existing business and entrepreneurship developmental programs.

Summary

Tazewell County, located in the majestic Appalachian Mountains of Southwest Virginia, was officially formed in 1799 from the counties of Russell and Wythe. Named for Henry Tazewell, a United States Senator (1794-1799), the diversity of culture, history, and geography of Tazewell County has few rivals in all of Virginia or even across the globe.

Similar to other rural localities in Virginia, Tazewell County's economic base evolved from predominantly agricultural activity in its early history coupled with a concentration of employment in the mining and mine-related industry which peaked in the 1970's. The present day focus of economic growth incorporates the mission of Virginia's e-Region, promoting jobs in the electronic information technology, energy, education, and emerging specialty manufacturing industries.

Developed business sites, improved infrastructure, workforce development and training for the unemployed and/or under-employed, improved infrastructure, and aggressive business incentives are needed for sustainable economic growth.

During the past few years, the county has improved basic infrastructure to support new business and industrial facilities and have attempted to diversify the region's economy. In order to position itself in a more favorable marketing stance, fiber optic cabling has been deployed in a backbone fashion to provide high speed internet capability to portions of the county. A significant economic development project called *The Bluestone: A Regional Business and Technology Center* is being planned with components such as office buildings, hotel and conference center, retail shops and restaurants, a golf course, seasonal lodging, and residential units.

Access and availability of adequate funding for developed sites infrastructure, incentives, and marketing are necessary to provide necessary jobs and improved quality of life for the residents of Tazewell County.

Goal: Support, diversify, and expand the county's economic base to provide employment opportunities for all and to increase income levels in all sectors

Objectives and Strategies:

1. Develop county financial strategy for future investments and creative programming to attain the progressive economic vision of the county.
   - ☐Support Bluestone project
   - ☐Target and market areas of the county for commercial and industrial development
   - ☐Develop and support appropriate and targeted workforce training opportunities for citizens and businesses within the county
   - ☐Target Claypool Hill area for commercial improvements to attract desired business and industry to the county
   - ☐Support current industry development and communication structure linked directly to economic development offices and staff
   - ☐Evaluate the possibility of hiring a full time Tourism Director for the county
   - ☐Create and support appropriate staffing for economic and cultural support of county goals
   - ☐Create incentives and welcoming strategies for targeted industries.
2. Support existing industries and businesses in the county
   - ☐Encourage existing industry expansion, by developing incentives and community relationship programs
   - ☐Promote "Made in Tazewell" concept—local produce and history at center of festivals, events, and local markets and shops
   - ☐Evaluate service industry growth in the county
   - ☐Support the expansion of agricultural-related businesses located in the county, especially "niche" farming like nurseries, viticulture, and agritourism
   - ☐Encourage the development of aquaculture activities in coordination with the Virginia Tech Aquaculture Research Center

D. Tourism

Along with business and industry, tourism has also proven to be an engine of growth in Tazewell County. Touted as Four Seasons Country, the Clinch River Basin is considered one of only twenty "Last Great Places" in the world according to the Nature Conservancy. Tourism and cultural heritage also play an integral role in Tazewell County's economy, and the county offers diverse cultural, and recreational activities, including the Historic Crab Orchard Museum, the Tazewell County Old Time and Bluegrass Fiddlers' Convention, the Pocahontas Exhibition Coal Mine and Museum, beautiful Burke's Garden and the Appalachian Trail, just to name a few.

The Crab Orchard's Pioneer Park is expanding to include a 16-acre tract that will include a Turn-of-the-Century community and include the relocated historic Pisgah Store and a farm heritage center. This facility hosts multiple special events including civil war re-enactments, pioneer recreations, and traveling exhibits from across Virginia and the world. Pocahontas is another leading tourist attraction in far Southwest Virginia and visitation at that museum continues to increase. The exhibition mine was designated a National Historic Landmark in October 1994 and attracts visitors from across the country. There are efforts underway to enhance the downtown and preserve historic structures within the Pocahontas community.

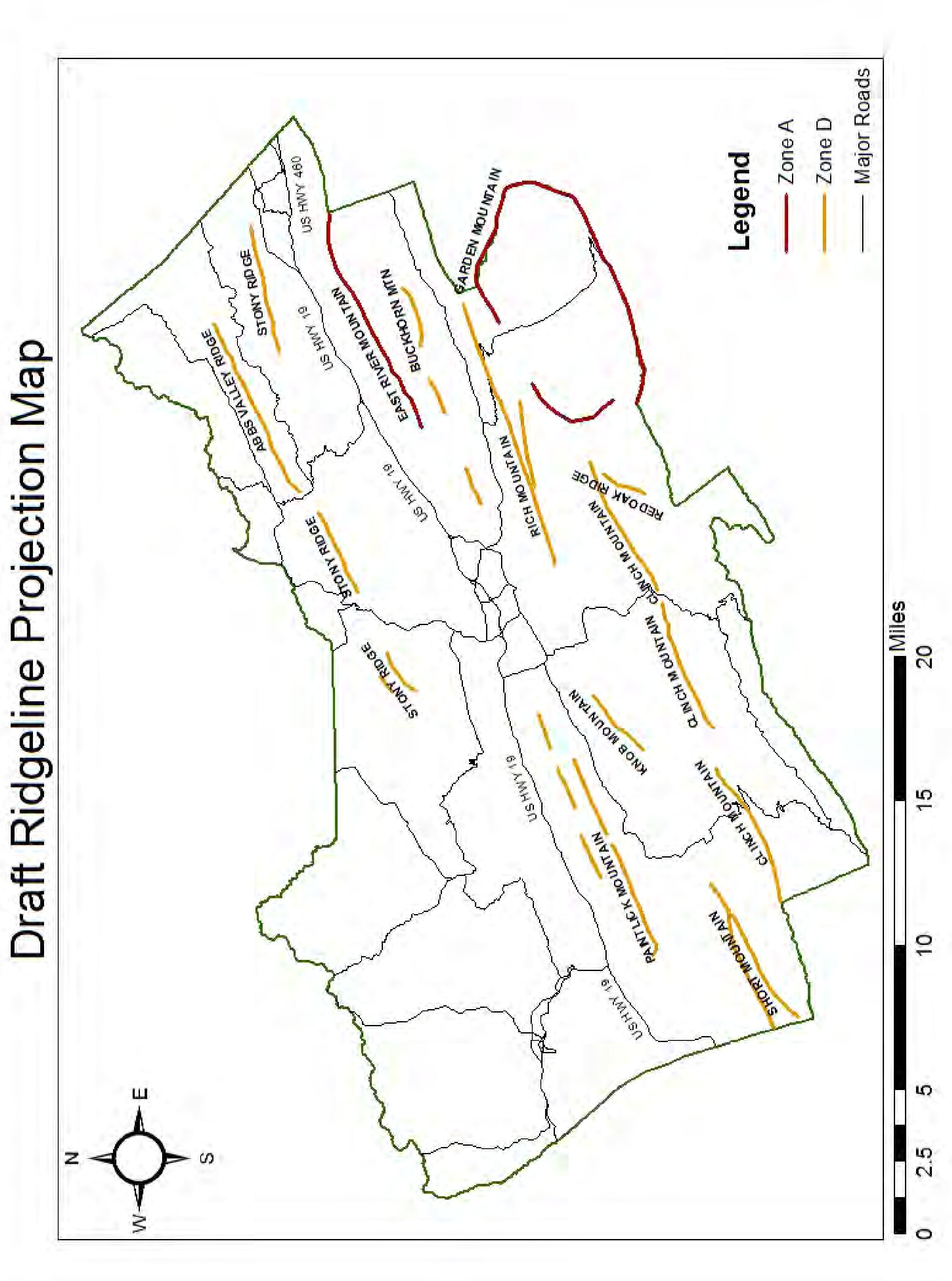
Burke's Garden is Virginia's largest rural historic district, and its geography is so distinctive that it is visible from space. The community holds a Fall Festival that attracts crafters and visitors to "God's Thumbprint" from around the world. Cultural institutions and unique communities like these are important to preserve the county's cultural heritage and to create economic benefit for the county through the visitor traffic and expenditures. Tazewell County's institutions of higher learning also contribute to community arts through their offering of special events and promotion to their student populations of local attractions and historic venues.

Other new tourism attractions include the Back of the Dragon and the "Original Pocahontas" ATV Trail. These attractions are for motorcycle/sports car/ATV aficionados. The Back of the Dragon has 32 miles of motorcycling and sports car excitement between Tazewell and Smyth Counties. The O.P. ATV trail includes over 30 miles of ATV trails near to the Town of Pocahontas, as well as two trailheads and multiple lodging sites.

Local attractions include Tazewell County’s majestic mountains with their scenic ridgelines. East River Mountain exemplifies this with the natural occurrence of the shelf spilling a waterfall of morning fog. This presents a need of the county to protect these ridgelines from uncontrolled development. The following figure identifies these ridgelines within the county that warrant protection.

Figure 8.8

Ridgeline Protection Ordinance Map



Tourism is clearly an important growth industry for Tazewell County and pursuit and support of enhancements in this area are crucial to the diversification of the local and regional economy. Unlike extracted resources, the natural and cultural tourist resources stay in the county, provide long-term benefit to the county and residents, and through support and enhancement, are a continually renewable source of financial and quality of life benefits for the entire county. Figure 6.8 helps to reveal the current economic impacts of tourism in the county today. These are based on the spin-off industry impact of visitors to the county such as restaurants, hotels, and gas stations. The growth over the three years that this chart shows is worthy of note as these numbers reflect historic visitor investment without the projected tourism enhancements pointed out in the Tazewell County Tourism Strategic Plan.

Figure 8.9

Tourism Economic Impacts

	2003		2006		2013	
Travel Impacts	**Tazewell**	**Virginia**	**Tazewell**	**Virginia**	**Tazewell**	**Virginia**
Visitor Expenditures	$31,040,239	$13,890,037,000	$38,890,075	$17,664,097,921	$48,910,000	$21,511,980,000
Payroll Generated	$7,878,150	$3,869,816,832	$8,558,524	$4,262,749,947	$10,200,000	$4,894,570,000
Employment Generated	531	201,130	542	208,236	570	213,000
State Tax Receipts	$1,494,405	$591,624,348	$1,753,605	$706,807,719	$2,060,000	$842,090,000
Local Tax Receipts	$461,579	$409,736,358	$556,621	$502,700,824	$660,000	$581,850,000

Virginia Tourism Corporation, 2006, 2014

The economy and culture of a community are strong indicators of the growth and trends. By understanding how the economic picture is changing and factoring in the cultural history of the county, there are many important lessons and opportunities present that can help direct Tazewell County into the future.

Along with business and industry, tourism has also proven to be an engine of economic growth in the county. Touted as Four Seasons Country, the Clinch River Basin is considered one of the “Last Great Places” in the world according to the Nature Conservancy. With phenomenal natural occurrences such as the East River Mountain shelf spilling a waterfall of morning fog, and the alluvial bowl known as Burke’s Garden, otherwise known as God’s Thumbprint, the tourism industry is clearly an important factor in the economy of the county, region and state.

In the past, the tourism efforts of Tazewell County have been coordinated through the Tourism Committee with limited planning. While the efforts have been productive, the increase of tourism activity have encouraged the Tourism Committee to consider a more organized, planned effort for tourism development and marketing. A SWOT (Strength, Weakness, Opportunity and Threat) analysis, facilitated by the Virginia Tourism Corporation, was used as a key method in developing a tourism-related strategic plan for Tazewell County. During the planning process, several issues were identified to include: lack of tourism infrastructure such as attractions, outfitters, and unique and formal restaurants, limited financial support to develop and market the area, and, lack of understanding of the positive economic impact of tourism among various groups such as elected officials, towns, and organizations.

The tourism committee has realized the potential for substantial future growth in many areas. Various opportunities of tourism development are possible through cooperative regional efforts, cooperative marketing, the development of public golf courses, the development of theme specific trails (i.e. Wilderness Road Trail, Virginia Coal Heritage Trail, Civil War Trail, Public Art Trail, Virginia Birding and Wildlife Trail, etc.), and the development of ATV trails, hiking and biking trails, and blueway trails. The Tourism Committee further realized the opportunity to attract the tour bus market and other specific target markets such as history and railroaders pleasure trips, ladies retreats, father/son get-a-ways, artisan expos, and mountain music weekends.

To enhance tourism opportunities, Tourism Zones in Tazewell County have been created. The Tourism Zones set aside areas designated for tourism development and to offer incentives that will encourage tourism development in these zones for up to 20 years.

Goal Statement: Promote the development of the tourism industry in the county.

Objectives and Strategies:

1. Increase tourism and residential visits to county landmarks and points of interest.

- ☐ Work with regional partners to promote and support development and events in the county.
- ☐ Develop new draws for tourism in the county
- ☐ Develop and support campgrounds and RV parks in strategic locations across county
- ☐ Develop incentives for promoting eating establishments and other “visitor support industry” in the county
- ☐ Access and map tourism destinations and opportunities in the county
- ☐ Advertise the existence of the tourist centers located with the county, i.e. Saunders House, Chamber of Commerce
- ☐ Advertise tourism through the existing tourism web site

- ☐Work with the Chamber of Commerce to continue to develop and support the tourist information center in the county
- ☐Promote and support the Crab Orchard Museum as a major tourist attraction
- ☐Encourage the development of tourism amenities such as lodging establishments (including “bed and breakfasts”), shopping attractions, and restaurants
- ☐Promote Tazewell County to travelers through participation in regional marketing efforts
- ☐Promote the "Back of the Dragon", "Original Pocahontas" ATV trail, and other new tourism attractions.
- ☐Educate community leaders and citizens of the benefits of tourism
- ☐Develop funding sources for tourism efforts
- ☐Provide adequate tourism-focused staffing to implement the strategic plan
- ☐Prioritize and develop tourism assets / products
- ☐Implement and effective marketing effort
- ☐Designate Areas of Tourism Zones
- ☐Market tourism zones
- ☐Promote further spin-off opportunities (i.e. Trails)
- ☐Promote and Market events such as that put on such as the concert put on by the Second Chance Learning Center

IX. Future Land Use Designations

The following Future Land Use Map (FLUM) is designed to guide future development of the Tazewell County according to the goals and objectives specified in the Comprehensive Plan. This is not a zoning map nor does it represent specific or detailed land uses today or into the future. The map is a broad-brush visual representation of the best understanding of the goals of the citizens as they apply to the use and protection of land resources of the county. The following definitions give context to the map.

A. Agricultural

High resource value areas based on soil types, environmental sensitivity, or other unique land characteristics. Includes areas that are preserved from development through public or private conservation efforts. Clustering of housing units is supported in this district.

B. Forestal

High resource value areas based on soil types, environmental sensitivity, or other unique land characteristics. Includes areas that are used for mining and gas production.

C. Rural Residential

Small clusters of residential units with some low intensity agricultural uses. These areas are intended to preserve open spaces and the agricultural landscape while allowing clustered residential development that minimizes impervious surfaces across properties.

D. Residential

Residential areas located in close proximity to urban services and roads capable of handling higher traffic volumes. These are areas for single-family detached and attached units and apartments/condominiums. Small-scale neighborhood and/or lifestyle commercial (such as small convenience markets and marinas) are allowed where appropriate in this zone.

E. Commercial

Areas designated for intensive commercial development with access to major roads and public utilities. Includes, but is not limited to, wholesale, retail, and service commercial uses.

F. Industrial

Areas designated for manufacturing, fabricating, commercial and agricultural processing and other land uses that are often water intensive and generally characterized as having a greater impact on the surrounding land uses and the environment.

G. Mixed Use

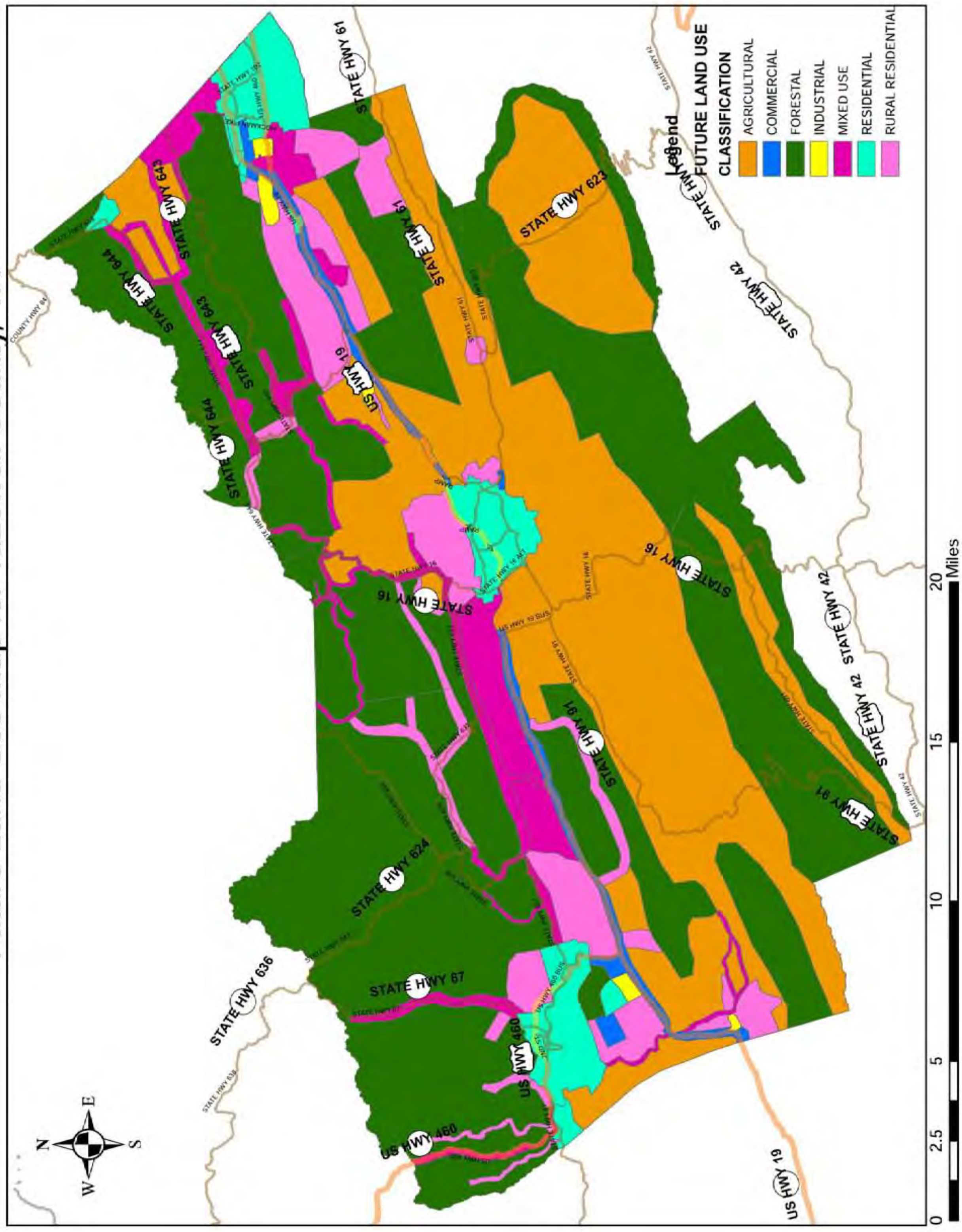
Areas with a mixture of residential, commercial, light industrial and civic uses located along major transportation corridors. Intention of these areas is to provide convenient services for neighborhoods and prevent strip development and multiple access points along major and secondary transportation corridors.

H. Scenic / Heritage Area

Areas with an emphasis on scenery or heritage should be maintained for

Figure 9.1

Future Land Use Map



TAZEWELL COUNTY VIRGINIA

"Bound For Progress"

Andy Hrovatic, Vice Chair
Western District

Aaron Gillespie, Member
Southern District

Margaret A. "Maggie" Asbury, Member
Northern District

Charles A. Stacy, Member
Eastern District

Shanna Plaster, Chair
Northwestern District

C. Eric Young
County Administrator

November 10, 2023

Matt Dalon
Virginia Department of Conservation and Recreation
Attention: Virginia Community Flood Preparedness Fund
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Mr. Dalon:

Thank you and the Department of Conservation and Recreation (DCR) for announcing the Community Flood Preparedness Fund (CFPF) round 4 grant manual offering grants and loans to support flood prevention and protection studies, planning, training, and implementation projects. Tazewell County led research, engagement activities, and planning to develop the recently completed *Tazewell County Flood Resilience Plan* – a project funded by the CFPF. We appreciate the funding to prepare the plan and are now interested in funding to take action!

Tazewell County is applying for grants for several regional projects:

Project	Cost estimate	Local cost share	Match
Richlands Elementary School BMP Design and Construction	$1,000,000	5% (nature-based project in a low-income area)	Request for waiver; if not, then $50,000
Blacksburg Street / Mill Dam Study	$300,000	10% (study in a low-income area)	$30,000
Bottom Road Study	$230,000	10% (study in a low-income area)	$23,000
Fire - Rescue Station 3 / Claypool Hill Study	$230,000	10% (study in a low-income area)	$23,000
Bluefield Area Study	$260,000	10% (study in a low-income area)	$26,000
Debris Removal Plan	$285,000	10% (plan in a low-income area)	$28,500

The Tazewell County Board of Supervisors, unanimously resolved at its November 9, 2023 regularly scheduled meeting to authorize these requests for assistance from the Fund and directed me to make available the necessary matching funds. The matching funds, if not waived (as indicated above), will be provided by in-kind match from staff labor supporting the project (to be adequately documented) and/or cash contribution from the County (varies per project).

We appreciate your consideration.

Sincerely,

C. Eric Young
Administrator, Tazewell County

197 Main Street ▪ Tazewell, Virginia 24651 ▪ (276) 385-1200 ▪ Fax (276) 988-4246
www.tazewellcountyva.org

TAZEWELL COUNTY VIRGINIA

"Bound For Progress"

November 10, 2023

Matt Dalon
Virginia Department of Conservation and Recreation
Attention: Virginia Community Flood Preparedness Fund
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Mr. Dalon:

Thank you and the Department of Conservation and Recreation (DCR) for announcing the Community Flood Preparedness Fund (CFPF) round 4 grant manual offering grants and loans to support flood prevention and protection studies, planning, training, and implementation projects. Tazewell County led research, engagement activities, and planning to develop the recently completed *Tazewell County Flood Resilience Plan* – a project funded by the CFPF. We appreciate the funding to prepare the plan and are now interested in funding to take action!

Tazewell County is applying for grants for several regional projects:

Project	Cost estimate	Local cost share	Match
Richlands Elementary School BMP Design and Construction	$1,000,000	5% (nature-based project in a low-income area)	Request for waiver; if not, then $50,000
Blacksburg Street / Mill Dam Study	$300,000	10% (study in a low-income area)	$30,000
Bottom Road Study	$230,000	10% (study in a low-income area)	$23,000
Fire - Rescue Station 3 / Claypool Hill Study	$230,000	10% (study in a low-income area)	$23,000
Bluefield Area Study	$260,000	10% (study in a low-income area)	$26,000
Debris Removal Plan	$285,000	10% (plan in a low-income area)	$28,500

The Tazewell County Board of Supervisors, unanimously resolved at its November 9, 2023 regularly scheduled meeting to authorize these requests for assistance from the Fund and directed me to make available the necessary matching funds. The matching funds, if not waived (as indicated above), will be provided by in-kind match from staff labor supporting the project (to be adequately documented) and/or cash contribution from the County (varies per project).

We appreciate your consideration.

Sincerely,

C. Eric Young

C. Eric Young
Administrator, Tazewell County

1.Introduction

Introduction

Flood hazards occur in almost every community, but with careful planning and deliberate action, such events can be prevented from turning into devastating disasters. With the frequency and severity of flooding projected to increase in the planning area, **it is imperative that Tazewell County work toward building a more resilient community that aims to reduce the impact of flooding on people and places**. A resilient future is built on a foundation of equity and an understanding of a community's unique needs, connecting the ways we respond to disasters through community-wide investments to improve the outcomes for all residents.

Flood events threaten the life and safety of residents and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and recreate in Tazewell County. While the threat from flooding may never be fully eliminated, the goal and conscientious practice of reducing risks to people and property is a proven worthwhile effort. This practice, combined with efforts to collectively strengthen the community against shocks and stressors, is referred to as **resilience planning**.

Local resilience planning involves the process of organizing community resources, identifying critical resources and capabilities, assessing needs and vulnerabilities, and determining how to best manage, expand, or strengthen critical resources to reduce risk. This process culminates in a resilience plan that recognizes the ability to anticipate, prepare for, respond to, and recover from significant hazards and threats with minimum damage to social well-being, health, the economy, and the environment. The resilience plan will identify specific activities designed to achieve risk reduction in both the near- and long-term.

Communities that participate in resilience planning have the potential to enjoy many benefits, including:

- Equitably improving community resilience by prioritizing the most vulnerable populations;
- Preventing loss of life and property;
- Avoiding disaster related costs;
- Recovering quickly from disasters;
- Reducing future vulnerability through better development practices;
- Expediting the receipt of pre-disaster and post-disaster grant funding; and
- Becoming eligible for resilience project funding through local, state, and federal opportunities, such as the State's Community Flood Preparedness Fund (CFPF)

Typically, communities that participate in resilience planning are described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of resilience planning is that the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, resilience practices will enable residents, businesses, and industries to re-establish themselves in the wake of a disaster. **This plan aims serve as a resilience plan for Tazewell County, specifically regarding flood resilience and flood risk reduction.**

Tazewell County Resilience Planning Background

Tazewell County's long history with destructive floods includes impacts to its community landmarks, homes, infrastructure, and businesses. However, the County has rarely possessed the resources to properly address flooding impacts and plan new approaches for the future. In 2022, Tazewell County received a grant from the Department of Conservation and Recreation's (DCR's) CFPF to build capacity and develop an actionable resilience plan. The County worked with Resource Environmental Solutions (RES) and Stantec to undertake a process to build capacity and develop an actionable resilience plan.

Plan Scope and Requirements

The Tazewell County Flood Resilience Plan was developed with funds and support from the CFPF. The CFPF was established in the Code of Virginia pursuant to Chapter 13, Title 10.1, Article 4, Section 10.1-603.24 and Section 10.1-603-25 and the provisions of § 10.1-1330. Clean Energy and Community Flood Preparedness Fund, which was passed during the 2020 session of the General Assembly. Money in the fund comes from the auction of carbon allowances through the Regional Greenhouse Gas Initiative (RGGI).

The fund was established to provide support for regions and localities across Virginia to reduce the impacts of flooding, including flooding driven by climate change. The fund will prioritize projects that are in concert with local, state and federal floodplain management standards, local resilience plans and the Virginia Coastal Resilience Master Plan. The fund empowers communities to complete vulnerability assessments and develop and implement action-oriented approaches to bolster flood preparedness and resilience.[1]

The following conditions shall apply to the use of moneys allocated from the fund:

1. Localities shall use moneys in the fund primarily for the purpose of implementing flood prevention and protection projects and studies in areas that are subject to recurrent flooding as confirmed by a locality-certified floodplain manager.
2. Moneys in the fund may be used to mitigate future flood damage and to assist inland and coastal communities across the commonwealth that are subject to recurrent or repetitive flooding.
3. No less than 25% of the moneys disbursed from the fund each year shall be used for projects in low-income geographic areas.
4. Priority shall be given to projects that implement community-scale hazard mitigation activities that use nature-based solutions to reduce flood risk.

In addition to the conditions described above, the CFPF is guided by the following principles, regardless of region:

1. Acknowledge climate change and its consequences, and base decision making on the best available science.
2. Identify and address socioeconomic inequities and work to enhance equity through adaptation and protection efforts.

---

[1] DCR. Community Flood Preparedness Fund Grant. Retrieved from Community Flood Preparedness Fund Grants and Loans (virginia.gov)

3. Utilize community and regional scale planning to the maximum extent possible, seeking region-specific approaches tailored to the needs of individual communities.

4. Understand fiscal realities and focus on the most cost-effective solutions for the protection and adaptation of communities, businesses, and critical infrastructure. The solutions will, to the extent possible, prioritize effective natural solutions.

5. Recognize the importance of protecting and enhancing green infrastructure in all regions and in the coastal region, natural coastal barriers, and fish and wildlife habitat by prioritizing nature-based solutions.

Eligible activities include flood prevention and protection projects and studies, capacity building, and planning.

This plan has been developed in accordance with the guiding principles presented above.

CFPF Criteria

Tazewell County contains the type of low-income communities that the CFPF was designed to support. The median household income in the County is only 55% of the Virginia median --$42,207 per year, versus $76,398 per year, in 2020 dollars according to the US Census Bureau. With this household income level, Tazewell County met the CFPF definition of a low-income community. Tazewell County's case for support for the CFPF grant was also demonstrated in the Virginia Institute of Marine Sciences (VIMS) Social Vulnerability Index.[2] Two of the Tazewell County's 11 census tracts fall into the High Social Vulnerability category, while the remaining 9 of 11 census tracts fall into the Moderate category. Social Vulnerability is detailed in *Section 4: Existing Conditions*. Further, two of Tazewell County's census tracts, 202 and 206, are federal designated Opportunity Zones.[3] Identification of the County's most vulnerable areas informed the Risk Assessment and the Risk Reduction Activities.

Summary of Plan Contents

This plan is designed to be as reader-friendly and functional as possible. It is divided into seven sections, which are detailed below.

The **Introduction, Section 1**, (this section) introduces the plan, its contents, and guiding principles.

Goals, Section 2, details goals that are intended to serve as plan outcomes.

The **Planning Process, Section 3**, describes the process used to prepare the plan. It identifies members of the Planning Team and how the public and other stakeholders were involved. It also includes a summary for each of the key meetings along with any associated outcomes.

Existing Conditions, Section 4, provides a general overview of Tazewell County, including geographic, demographic, environmental, and economic characteristics. In addition, this section discusses building characteristics and land use patterns, as well as an overview of the county's flood history and risk reduction efforts. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that play a role in determining the county's vulnerability to flood hazards.

---

[2] Virginia Vulnerability Viewer. Retrieved from [VA SocialVulnerability (vims.edu)](#).

[3] IRS. Opportunity Zones. Retrieved from [Opportunity Zones | Internal Revenue Service (irs.gov)](#).

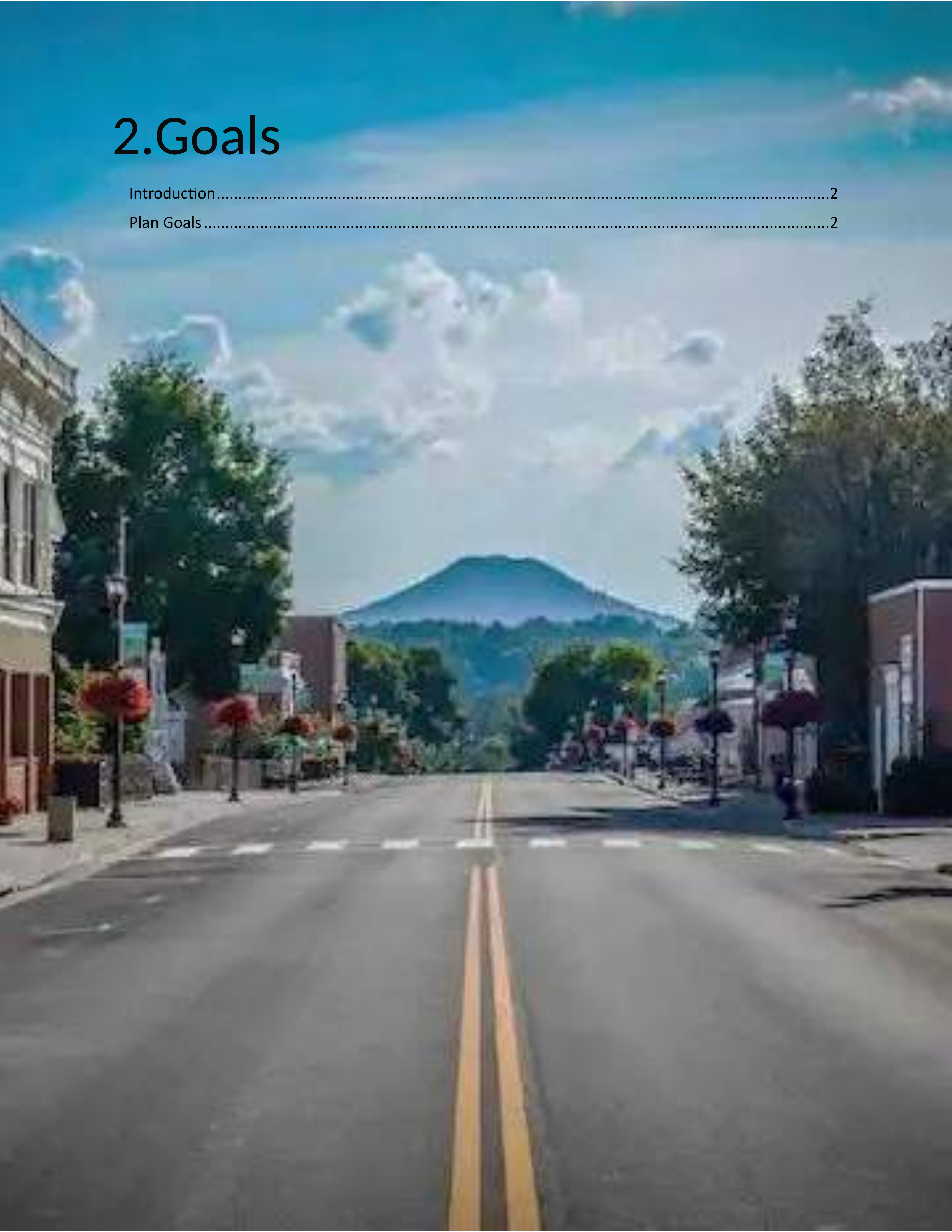
The **Capability and Capacity Assessment, Section 5**, provides an inventory and analysis of existing plans, ordinances, policies, and relevant documents that support Tazewell County in flood risk reduction efforts. The purpose of this assessment is to identify any existing gaps, opportunities, or conflicts in programs or activities that may hinder flood mitigation efforts and determine activities that should be built upon to establish successful and sustainable flood risk reduction policies, actions, and practices. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability (e.g., available data), fiscal capability, and political capability. Information was obtained through the use of review of data, review of plans, stakeholder interviews, and Planning Team meetings.

The **Risk Assessment, Section 6**, serves to identify, analyze, and assess flood hazards that threaten Tazewell County, including natural and man-made contributors to flooding within the county. A GIS structure-based risk assessment (the Flood Hazard Analysis) is provided using publicly available and county building data along with FEMA flood data. Future flood conditions are assessed in this section in terms of changes to flood frequency and severity due to climate change. The risk assessment also addresses critical facilities, vulnerable populations, and identifies areas of the county prioritized for risk reduction based on risk assessment results and community input. The risk assessment enables the County to prioritize and focus its efforts on flood hazards of greatest concern and those structures or areas facing the greatest risk.

The Existing Conditions summary, Capability and Capacity Assessment, and Risk Assessment, collectively, along with stakeholder and public outreach and input, serve as a basis for determining actions or projects for the Tazewell County Flood Resilience Plan, each contributing to the development and implementation of a meaningful and manageable Action Plan that is based on accurate background information.

The **Flood Risk Reduction Action Plan, Section 7**, identifies strategic actions that Tazewell County can implement to reduce flood risk. Overall, 18 flood risk mitigation actions were identified for Tazewell County. Each action is described in detail including a project description, project lead, action description, steps for implementation, and funding sources. As available, estimated time to complete and estimated costs were provided. Eight prioritized actions are identified. Priority actions are those identified through the planning process to have the largest potential impact on flood risk reduction in the county or are actions that are critical first steps in order to reduce risk directly or expand the County's capability to implement a range of future risk reduction actions. Priority actions were identified based on feedback from the Planning Team, comments during the Public Meetings, and the Risk Assessment results.

2.Goals



Introduction

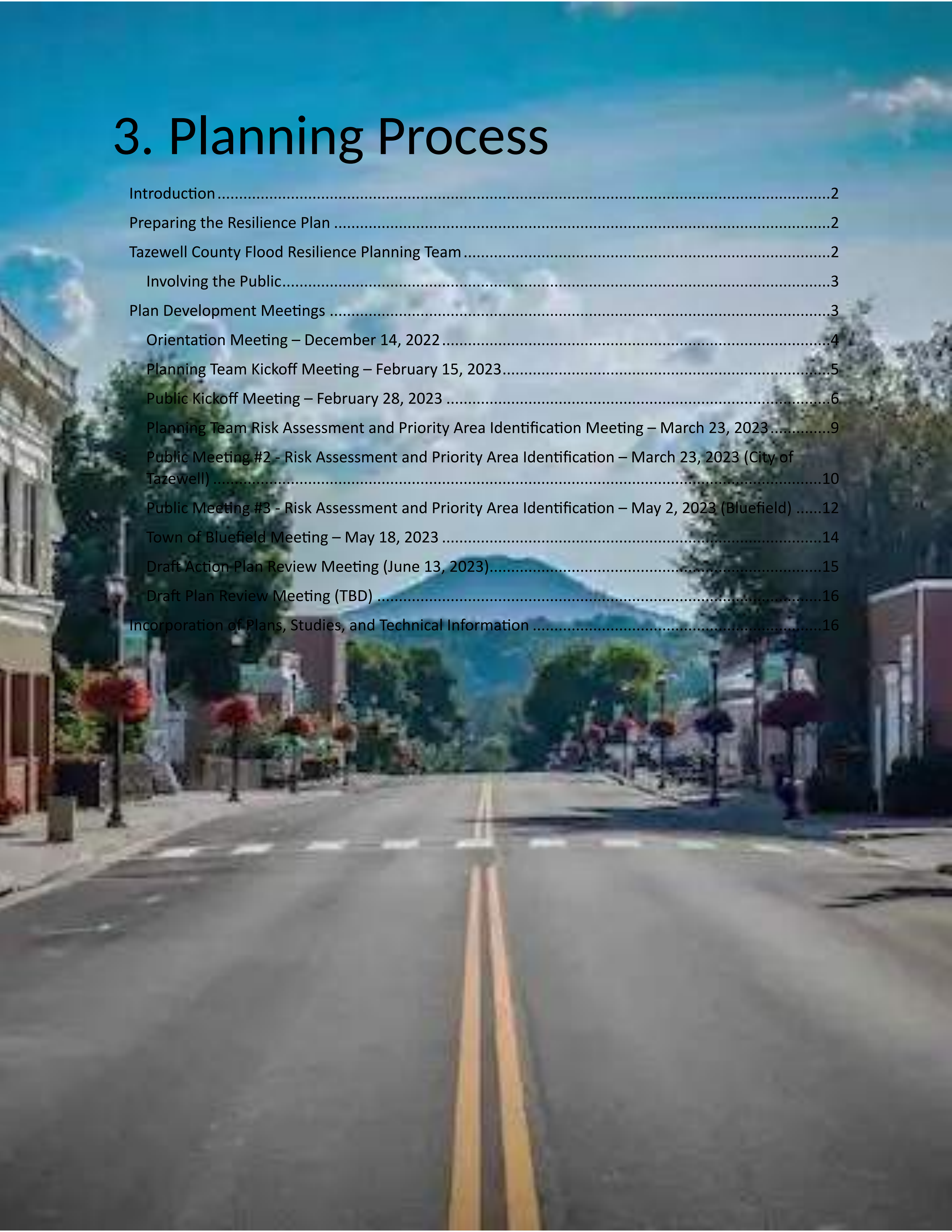
The primary goal of all local governments is to promote the health, safety, and welfare of its citizens. In keeping with this standard and promoting a proactive and equitable approach to disaster management and flood risk reduction, Tazewell County reviewed, revised and ultimately defined six goal statements for the flood resilience plan. These goals were developed to be reflective of current flood risk reduction priorities within the county. The goals were developed during the CFPF application process and carried through the planning process.

Plan Goals

Flood resilience goals represent broad statements that set the blueprint for the Action Plan and encourage stakeholders to envision plan outcomes. The six goals identified are presented below:

1. Understand flood risk and identification of projects for flood preparedness, control, and resilience;
2. Incorporate green, grey, and blue projects with an emphasis on nature-based solutions;
3. Integrate the whole community, regardless of socioeconomics or race;
4. Coordinate with existing and planned relevant projects, plans, and activities;
5. Leverage best available science and incorporation of current and future flood data; and
6. Develop a plan that provides a pathway to uninterrupted primary public roadway access, increased public safety, and less flooding.

3. Planning Process



Introduction

A robust planning process is integral to the development of a resilience plan. The planning process involves identifying and convening a Planning Team, identifying and engaging stakeholders and the public, collecting data, and integrating plans, studies, and technical information.

Preparing the Resilience Plan

County staff and the consultant team designed a planning process to create the County's first flood resilience plan that met the 12-month timeframe required by the CFPF grant award. The process follows the agreed upon work plan developed as part of the CFPF application, which outlined the major tasks to be completed. Through completion of these tasks, the consultant team developed the contents for the final resilience plan. The process's major tasks are presented in **Table 31**.

Table 31: Tazewell County Flood Resilience Plan Planning Process

Resilience Planning Process
1. Form the Planning Team
2. Engage Stakeholders
3. Data Collection and Review
4. Capacity and Capability Needs Assessment
5. Risk and Vulnerability Assessment
6. Priority Area Identification
7. Prioritized Flood Risk-Reduction Actions

A necessary and important activity at the beginning of the process was to establish the Tazewell County Flood Resilience Planning Team (Planning Team) with broad representation from across the county to guide the process and plan contents. Planning Team members were chosen because of their knowledge of the County's flood history and their contributions to the County's capability to implement flood resilience projects. Together with the consultant team, the Planning Team maintained compliance with CFPF grant requirements, enabling eligibility for future CFPF funding for implementation projects.

Tazewell County Flood Resilience Planning Team

The Planning Team played an important role throughout the planning process. Members included a broad range of stakeholders vested in flood control, preparedness, and resilience, including community leaders and emergency response, building, and floodplain management officials. Regional planners from the Cumberland Plateau Planning District Commission (CPPDC), and State representatives (e.g., Virginia Department of Conservation and Recreation (DCR) and Virginia Department of Emergency Management) were engaged and invited to participate on the Planning Team. Planning Team members met regularly (approximately bi-monthly) and were responsible for providing input throughout the planning process such as understanding of existing and planned projects, plans, and data, review of draft materials, and project prioritization. Planning team members are presented in **Table 32**.

Table 32: Tazewell Flood Resilience Plan Planning Team

Name	Title/Role	Jurisdiction / Agency
Robin Boyd	Executive Director	Clinch Valley Community Action
Barry Brooks	Fire Chief, Emergency Management Coordinator, Director of Public Safety	Tazewell County
Jeff Buchanan		VDOT (Lebanon Office)
Jane Cordle	Stormwater	Tazewell County
Kenneth Dunford	Director of Engineering	Tazewell County
Brad Gibson	GIS/Mapping	Tazewell County
Gary Jackson	Building Official	Tazewell County
Charlie Perkins	Planner II	CPPDC
Shanna Plaster	Board of Supervisors	Tazewell County
Eric Young	County Administrator, Emergency Manager	Tazewell County

Involving the Public

Public participation was an important component of the planning process. Individual citizen and community-based input provides the entire Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community "buy-in" from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety and quality of life, they are more likely to gain a greater understanding of the flood hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall resilience strategy aimed at making a home, neighborhood, school, business, or entire city more prepared for flooding or other related problems.

Public involvement during the county's development of the plan was sought using three methods: (1) three public meetings were held during the planning process, as described further in this section; (2) the plan was promoted through social media, traditional media (e.g., newspaper, radio, cable TV), and church mailers; and, (3) copies of the draft plan deliverables were made available and advertised for public review and comment online. These methods ensured the public was involved during plan development and had the opportunity to provide input on the draft plan and identified resilience actions prior to adoption and approval. A link to an electronic version of the draft plan was posted and advertised via social media and the project website from July xx to July xx, 2023. The final plan was reviewed and approved by the County Board of Supervisors on August xx, 2023 during a public meeting.

Plan Development Meetings

The preparation of this plan entailed a series of meetings, stakeholder interviews, and workshops for facilitating discussion, gaining consensus, and completing data collection efforts with local government staff and community officials. More importantly, the meetings fostered continuous input and feedback from relevant participants throughout the planning process. The Planning Team and consultant team made considerable efforts to publicize the meetings to invite a broad range of stakeholders. The summaries below of the key meetings demonstrate how stakeholders and the public contributed directly to plan development. Meetings are summarized chronologically.

Orientation Meeting – December 14, 2022

The purpose of the Orientation Meeting was to review the scope of work, schedule, and resources with a small core team. It was a virtual meeting that served as the formal kickoff to the planning process. The meeting was facilitated by the consultant team from RES and Stantec. Following introductions, each phase of the planning process was reviewed, the proposed schedule was reviewed, and the team reviewed responsibilities of the core team members present on the call. Input on potential Planning Team members was gathered, and flooding hotspots, including previous impacts, were viewed along with past and ongoing flood mitigation projects. In the initial project documentation and CFPF grant application, several flooding hotspots were identified. Feedback on those hotspots and additional hotspots were gathered during the meeting. Key feedback is summarized in **Table 33**. Additionally, the core team discussed the need for debris clean-up and vegetation clearing along rivers and creeks. The County has discussed it, but the permitting was reported to be cost prohibitive. Participants also noted that a large number of residents potentially live in dam inundation areas.

Table 33: Tazewell Orientation Meeting Flooding Hotspot Feedback

Area	Feedback
	Initial Project Documentation Hotspots Feedback
Clinch River in Raven	• One of the most vulnerable areas in the county because of the number of people living close to the river. • The Raven Road Bridge is the only access point and could strand a large number of people. VDOT has been concerned about the bridge washing out during large events. • Flooding is typically caused by the large volume of water. There are several trailer parks in this area.
Clinch River at Plant Road near Richlands	• Water got into the compound area of the Wastewater Treatment Plant in 2020. • The property to the east of the plant flooded and water covered the entire open area.
Clinch River in Richlands	• There is reported flooding along Fourth Street, flooding along the west side of the river, and flooding of Legacy Hospice (continuing care, not residential)
Big Creek in Richlands	• Flooding occurs mainly on the road. It is not as big of a concern as other areas.
	Additional Hotspots Identified
Wastewater Treatment Plants	• All the wastewater treatment plants in the county are in low lying areas. • The Tazewell County Wastewater Treatment Plant is especially problematic with flooding on Lazy Lane.
Fourway (Town of Tazewell)	• A car dealership was driven out of business due to flooding. • Businesses flood in the area. • The area has been proposed as a site for an indoor travel basketball facility.
2750 Clinch Street	• Potential area for flood storage

Planning Team Kickoff Meeting – February 15, 2023

The Planning Team Kickoff Meeting was held in Richlands, VA on February 15, 2022. During this meeting, introductions were completed, and a project overview was given, to include the plan purpose, goals, overview of tasks, and schedule. Progress to date, such as data collection, was described, outstanding data needs were conveyed. A discussion was held to inform capabilities, capacities, identify critical facilities, identify previous flood impacts, and understand previous mitigation efforts. A summary of the feedback is shown in **Table 34**.

Table 34: Tazewell Planning Team Kickoff Meeting Feedback

Capacity Feedback

Focus Area	Feedback
Land Use	• Most construction in the floodplain occurred prior to ordinances. • Floodway has been restricted by development and debris. The logging industry has added debris and cleared land from logging has altered the floodplain. Logging permits are approved immediately with no investigation. • Doran Bottom 2020 flooding was the largest flooding in memory of local residents. • Mussels prevent debris cleanup.
Plan & Policies	• The state enforces stormwater restrictions. • Lack of stormwater management in Tazewell leads to flooding in Richlands. • Flat land in the area is at a premium. Flooding prevents development and resale of private real estate. • Riparian buffers are not a viable option. • Flooding hotspots include Bluestone, Falls Mills, Falls Mills Lake, Tributaries surrounding Richlands, and Bandy.
Data	• The consulting team highlighted that high water mark records and property records can help with FEMA FIRM production. • 2020 flood data was recorded through VDEM platform. • There is a need for more stream gauges. Current stream gauges are from VDEM.
Human Component of Flooding	• Many citizens have lived in their homes for generations or their whole life. • The public may not strongly support buy-out programs.
Staffing	• No Certified Flood Manager (CFM) on staff. • Would prefer contract workers over full-time staff.
Hazard Mitigation Planning (HMP)	• Community not very familiar with HMP. • Tazewell is included in Cumberland Plateau Planning District Commission (CPPDC) HMP updated in September 2018.
Emergency Management	• The Emergency Operations Plan (EOP) is in the process of being updated. • The EOP does not include debris removal. Encouraged by VDEM to work with VDEQ for debris removal EOP. • In 2020, had "evacuations" that were really rescues. After the 2020 flood, they purchased swift boats. • Cavitt's Lake EOP has an evacuation plan.

Public Kickoff Meeting – February 28, 2023

A public meeting was held at the Tazewell County Administration Building on February 28, 2023. The purpose of the meeting was to introduce the resilience plan and describe why creating the plan will benefit the community. The overall planning process, proposed schedules, and progress to date was described. County flooding issues were also identified, and future engagement opportunities were emphasized. A mapping exercise was held to identify flooding hot spots. Following the previous Planning Team Meeting, Tazewell County had a flood event so there was additional feedback from the recent event. Outside of the consulting team staff, 8 participants from the public attended. Four of the participants from the public are also on the Planning Team. Feedback on over 20 flooding hotspots were identified in the meeting. Key feedback is summarized below in **Table 35** and a map of the hotspots is shown in **Figure 31**.

Table 35: Tazewell Public Kickoff Meeting Feedback

Flooding Hotspots

Area	Feedback
Raven/Doran Area	• Doran Bottom Road floods frequently and has to be shut down. • Flooding on the west side prevents people from exiting the area. • Some stormwater pipes exceed capacity and have water run the wrong direction. • The bridge improvement project resulted in more water running onto adjacent properties.
Richlands	• The Police Station and EMS Station were not accessible during the 2020 flooding event. There have been talks about relocating the Police Station outside of the floodplain, but funding has been a constraint. • Stormwater flooding at Richlands Elementary school blocks access to the drop off/ pick up area. There are two county stormwater lines running under the school that have exceeded capacity.
Lynn Hollow Road	• Residents report flooding when landfill soils move to lower ponds and down the creek. Basements have been filled with water that has a strong odor.
Mill Creek Road	• The road runs parallel to the creek. Residents report frequent flooding of the road that extends onto their properties. • Flooding at the intersection of Nash Hill Road at Mill Creek Road blocks access to all of Mill Creek Road which is largely residential.
Other Flooding Feedback	• Cedar Bluff low bridge captures debris. Houses flood between the flood hazard area and the road consistently. • Blacksburg Road regularly floods with any amount of rain. • Flood insurance is cost prohibitive.

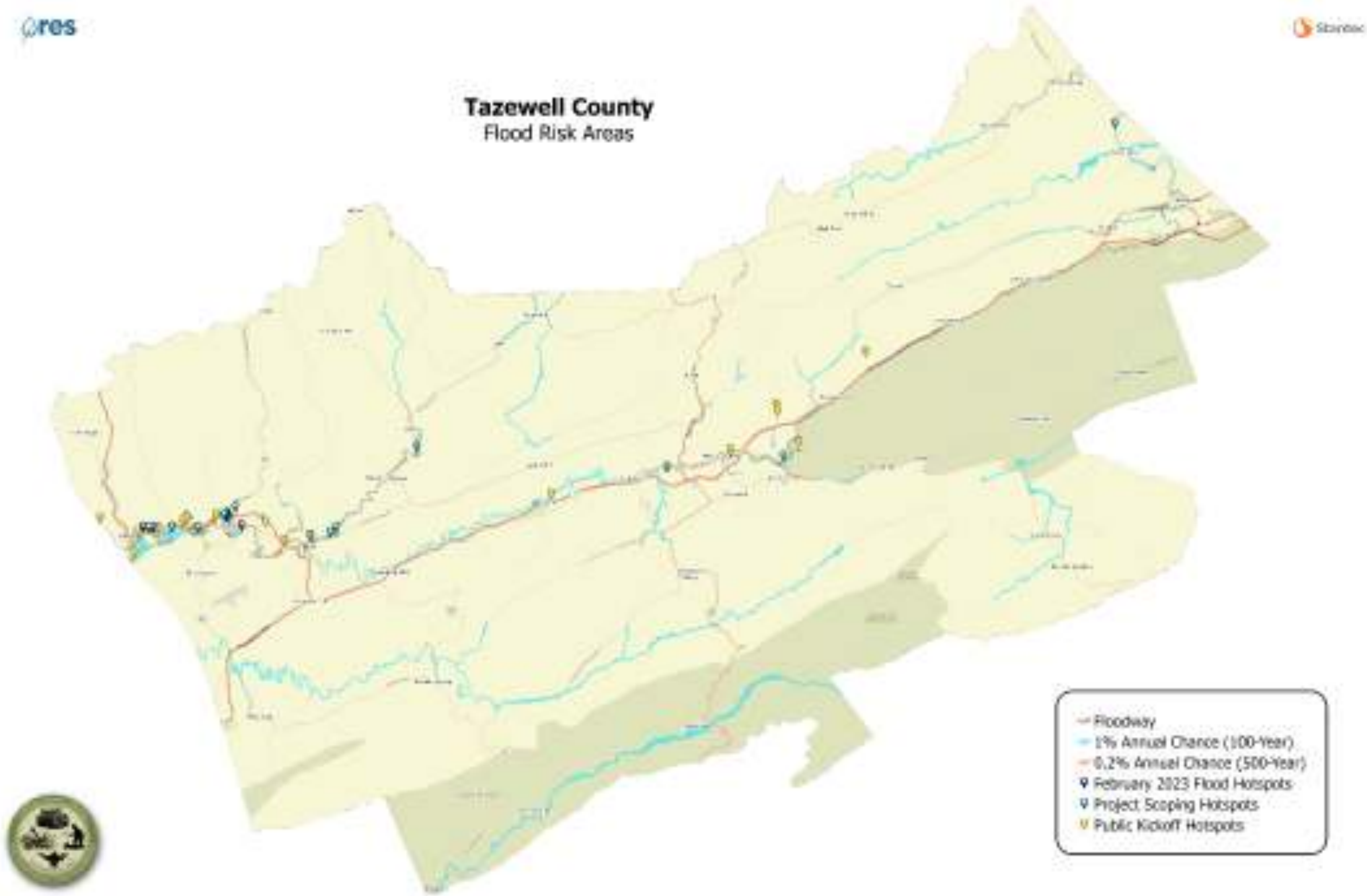


Figure 31: Identified flooding hotspots from Public Kickoff

Planning Team Risk Assessment and Priority Area Identification Meeting – March 23, 2023

On March 23, 2023, a Planning Team workshop was held in Richlands. The meeting reviewed progress to date, including preliminary results of the capability and capacity assessment. Risk assessment results were discussed, and types of flood risk reduction measures were introduced. Preliminary flood risk reduction projects based on feedback in previous meetings and the risk assessment were presented. It was reported that the February 2023 floods led to a landslide in Tannersville. A discussion was held on preliminary flood risk reduction measures and additional flood risk reduction measures.

Table 36: Tazewell Planning Team Risk Assessment Meeting Feedback

Preliminary Flood Risk Reduction Projects Feedback

Project	Feedback
Richlands Police Headquarters and EMS	• The buildings do not flood but the access gets flooded and closed. • Washington Square Clinic in the same area also gets completely blocked.
Tazewell County Landfill	• The County believes the flooding is not coming from the landfill but is coming from the mountain based on a study by the landfill. • There is not a maintenance schedule for the ponds, but they are dredged periodically to maintain their stormwater permit. • Update the project to focus on identifying where the flooding is coming from.
Property Acquisitions	• Richlands has acquired one house before that was repurposed. • The consulting team recommends trying to acquire whole neighborhoods at a time. • The County has used FEMA grants to tear down homes and rebuild at a higher elevation on the same property.
Richlands Elementary School	• Stormwater has impacted Richlands Elementary and Middle School. • There have been talks of relocating the school(s).
Wastewater Treatment Plants	• The Wastewater Treatment Plant and Water Treatment Plant in Richlands both flood. • Flooding does not typically get in the plant and stop operations, but it completely blocks access.
Raven / Doran Bridge	• The bridge was rebuilt after the 2020 flood. • There are multiple flooding issues in that area that are more severe than the bridge.
Community Rating System (CRS)	• Tazewell County participates in the National Flood Program but not in CRS.

Additional feedback was provided on a recent project being pursued in North Tazewell to build a basketball facility on the property of a former car dealership that was impacted by flooding. The area is within a flood hazard area and is mainly fill soil.

Public Meeting #2 - Risk Assessment and Priority Area Identification – March 23, 2023 (City of Tazewell)

A public meeting was held at the Tazewell County Administration Building on March 23, 2023. During this meeting, attendees were given an overview of the planning project, including scope, goals, and progress to date. A summary of risk assessment results was provided and an overview of types of flood risk reduction measures. A mapping exercise was held to identify flooding hotspots and potential mitigation actions. Outside of the consulting team staff, 6 participants from the public attended. All 6 participants were from the Blacksburg Street Community in Tazewell.

During the mapping exercise, the consulting team received public feedback on flooding issues faced by the Blacksburg Street Community. The key points are summarized below:

- Blacksburg Street is a historically black community in Tazewell. The community currently has about 10 homes. Historically, it was a much larger community with its own church.
- Flooding has been a reoccurring issue in Blacksburg but has gotten worse. They get flooding from all sides of the peninsula. At the end of the street, water comes up the road which completely blocks access. During the 2003 floods, several residents had to be rescued from the church. Flooding in the area occurs very rapidly.
- The abandoned Farm Bureau Building causes debris to build up which worsens flooding. Flooding impacts are also worsened by beaver dams, sedimentation, and debris build up. The Farm Bureau Building is shown in **Figure 32**.
- Residents report that they have not been allowed to install flood mitigation measures that have been allowed in other parts of the town. Additionally, when flooding events have occurred, they did not receive assistance after the event.
- Residents at the meeting expressed concern about not having anything to pass down to their children. Most of the remaining community members are older or renters. Many residents have built equity in their homes. If another flooding event occurs, they are worried they will “wake up in the river”, be unable to recover, and will lose their homes.
- Potential solutions discussed include removing the abandoned Farm Bureau building, stream restoration, beaver removal, and a flood wall. Feedback during the meeting was mapped in an exercise as shown in **Figure 33**.

Figure 32: Abandoned Farm Bureau Building capturing debris.

Figure 33: Mapping Exercise from Tazewell Risk Assessment Public Meeting

Public Meeting #3 - Risk Assessment and Priority Area Identification – May 2, 2023 (Bluefield)

A public meeting was held at Graham High School in Bluefield, VA on May 2, 2023. Prior to this meeting, the engagement meetings had been held in the southern portion of the county. One of the goals of the meeting was to get more feedback on the northern part of the county including Bluefield. During this meeting, attendees were given an overview of the planning project, including scope, goals, and progress to date. A summary of risk assessment results was provided and an overview of types of flood risk reduction measures. A mapping exercise was held to identify flooding hotspots and potential mitigation actions. Outside of the consulting team staff, 4 participants from the public attended including the mayor of Bluefield.

During the mapping exercise, the consulting team received feedback on flooding issues faced by Bluefield. Additionally, the mayor gave the consulting team a tour of some flooding hotspots following the public meeting. It was noted that the Town of Bluefield would like to be more involved in the plan and agreed upon to set up a follow up meeting with the Town. The key points are summarized below:

- The culvert at the crossing of College Avenue near Twin City Shopping Center gets full of sediment. During previous floods, the creek flooded the entire parking lot of the shopping center.
- The creek runs along Spring Street and alongside several businesses such as Premier Realty (shown in **Figure 34**). During floods, Spring Street floods and businesses are impacted. Business owners are worried about losing their businesses and being unable to recover.
- Beaverpond Creek near Jack Asbury Square floods and impacts the downtown area including College Avenue. FEMA previously acquired and demolished several properties in this area due to flooding. A local church is turning them into a recreation area. The flooding of College Avenue impacts fire station access to the community. The creek is shown in **Figure 35.**
- The Reynolds Avenue and Dudley Street areas frequently flood during heavy rains blocking access and impacting homes. Many residents move their cars, appliances, and electronics to higher elevations during rain events to help mitigate flooding damage. Residents report stream bank erosion and debris issues throughout the area. They also believe flooding has gotten worse from nearby development.

Figure 34: Creek running alongside Spring Street and Premier Realty

Figure 35: Beaver Pond Creek near Jack Asbury Square

Town of Bluefield Meeting – May 18, 2023

A virtual meeting was held with Town of Bluefield and Emergency Services personnel on May 18, 2023. During this meeting, attendees were given an overview of the planning project, including scope, goals, and progress to date. Most of the meeting focused on an interactive exercise to map flooding hotspots throughout Bluefield and the northern part of the county. Over twenty hotspots, were identified in Bluefield as shown in **Figure 36.** Several key areas were identified as flooding hotspots as summarized below.

- The area between Beaverpond Creek and Leatherwood Lane southeast of College Avenue frequently floods. The gas station had to raise their pumps due to the frequency of floods. The nearby parking lots frequently flood and there are beavers throughout the area.
- The culvert near Twin City Shopping Center has sedimentation issues. During floods, the parking lot floods and floodwaters get very close to College Avenue north of the culvert.
- College Avenue at Stockton Road floods at least once a year. Emergency Services must reroute traffic through a gravel road. There are debris issues in the area and a low-lying bridge.
- Beavercreek Pond near Jack Asbury Square floods. The creek alongside Spring Street is also a hotspot and the road gets blocked from flooding. Access to the fire station gets blocked a few times a year but does not impact the building.
- The Reynolds Avenue and Dudley Street areas flood frequently. The intersection of Hockman Pike and Mobile Estates gets flooded frequently blocking access.
- There are several roads that get blocked by flooding in Falls Mills including Walton Street near Brush Fork Creek, Adams Drive at Brushfork Road, Adams Road near the railroad tracks, and Yards Road near Waterbury Road.

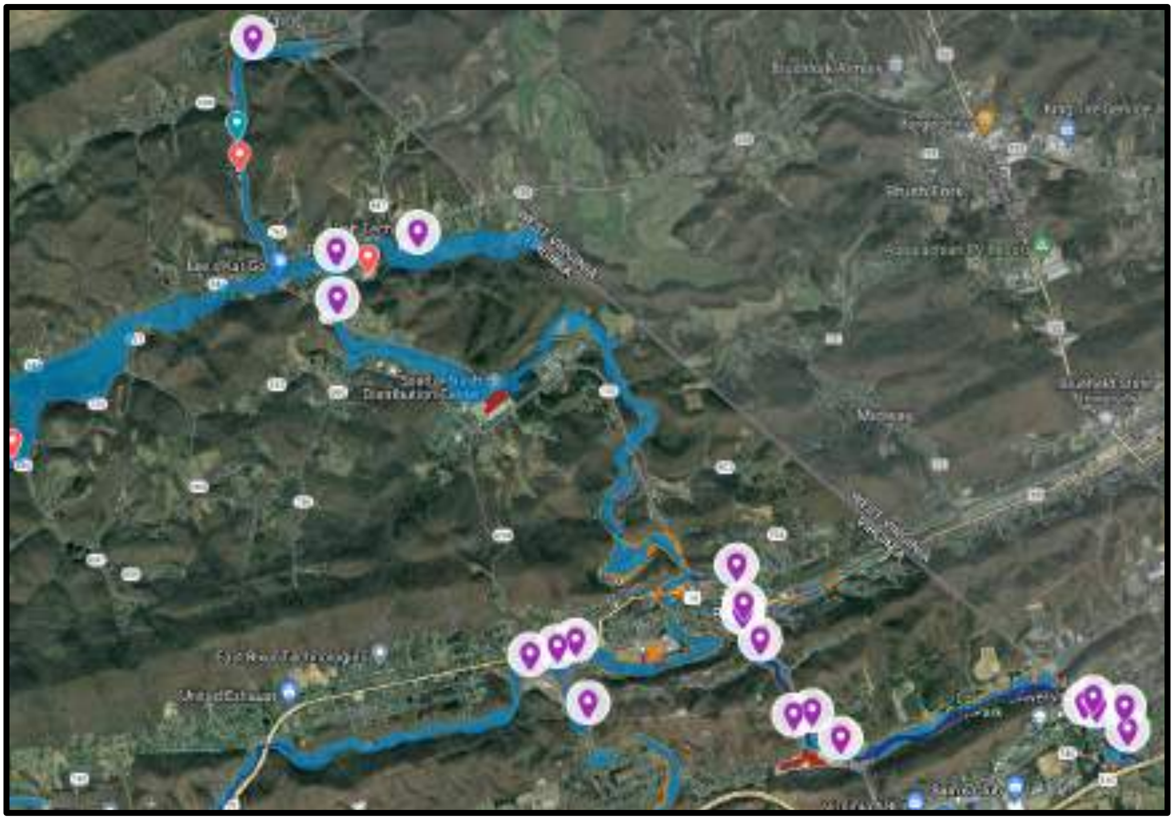


Figure 36: Identified Bluefield Flooding Hotspots

Draft Action Plan Review Meeting (June 13, 2023)

An Action Plan Review Meeting was held on June 13, 2023. This meeting was held virtually and provided an opportunity for the Planning Team to review projects included in the latest draft of Action Plan.

Flood Risk Reduction Projects Feedback

Project	Feedback
Richlands Police Headquarters and EMS	• Community does not want to tear down the Police Headquarters and EMS Station. • Would prefer to convert to a community center or public gym.
Hill Creek Area	• One individual’s yard has dropped about a foot; flood water almost reaches the house now. • Flooding issues are worsening.
Lake Park Area	• Oriole Street at Eagle Street floods consistently. • This area used to have a small lake which was removed, but streets still flood.
Property Acquisitions	• Still looking into buying out homes in the Blacksburg Street neighborhood; this would be the most cost-effective strategy. • The abandoned mill building in North Tazewell would be an appropriate acquisition. Would require large amounts of funds but would reduce flooding issues in the area.

Flood Risk Reduction Projects Feedback

Richlands Schools	• Richlands Middle School's auditorium floods frequently. This is a large issue and should be a priority because the auditorium serves as an emergency shelter. • Richlands Elementary School has a blocked drain. • Flooding may be due to a high water table or aquifer.
Raven/Doran Area	• Raven/Doran area would be a great area to complete 2D BLE modeling. • Some residents in Raven are open to moving. • Need for an evacuation plan. • Suggested the idea of a reverse 911 service to update residents when roads are flooded. Would be ideal if this included updates that were coordinated with the public school bus system.
Debris Cleanup	• Agreement that debris removal needs to be prioritized. • Need to have authority to remove debris with excavator.
Recent Flooding	• Flooding recently occurred in Pocahontas. The County Administrator will follow up and get more information. • Town of Bluefield recently experienced severe flooding. A rain gauge failed during the event and is being recalibrated.
Richlands Fire-Rescue Station 3	• Stormwater pipes are severely undersized. Need to be updated.

Draft Plan Review Meeting (TBD)

This meeting anticipated to be virtual, with posting and comment collection through the project website and social media.

In addition to meetings with officials from Tazewell County, City of Tazewell, Richlands, and Bluefield, the consultant team attempted to contact officials from Cedar Bluff and Pocahontas to provide input during the planning process.

Incorporation of Plans, Studies, and Technical Information

Several plans and studies were leveraged during development of the Flood Resilience Plan. Specific references to other plans and studies may be found throughout the plan, primarily in *Section 5: Capability and Capacity Assessment* and *Section 6: Risk Assessment*. Examples of plans and studies incorporated into this plan include:

- Local planning documents (e.g., floodplain management ordinances, land use plans);
- Cumberland Plateau Planning District Commission Hazard Mitigation Plan;
- US Army Corps Flood Plain Management technical services and planning study for Richlands (including hydraulic modeling and FEMA Flood insurance study update);
- Local, state, federal hazard technical information (e.g., US Army Corps data, FEMA Flood Insurance Rate Maps, US Fish and Wildlife); and,
- Regional plans (e.g., economic development, environmental).

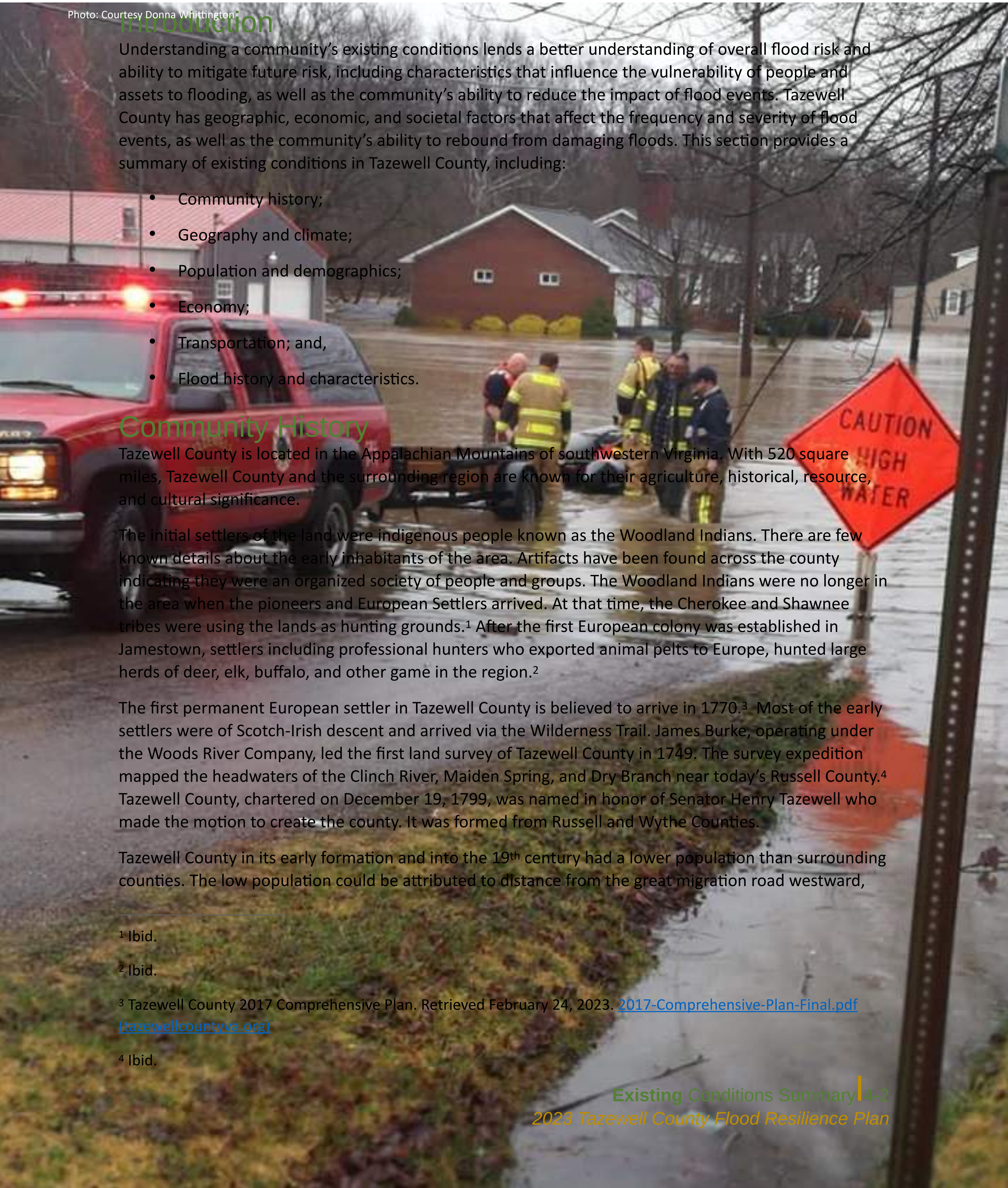


Photo: Courtesy Donna Whittington

Introduction

Understanding a community's existing conditions lends a better understanding of overall flood risk and ability to mitigate future risk, including characteristics that influence the vulnerability of people and assets to flooding, as well as the community's ability to reduce the impact of flood events. Tazewell County has geographic, economic, and societal factors that affect the frequency and severity of flood events, as well as the community's ability to rebound from damaging floods. This section provides a summary of existing conditions in Tazewell County, including:

- Community history;
- Geography and climate;
- Population and demographics;
- Economy;
- Transportation; and,
- Flood history and characteristics.

Community History

Tazewell County is located in the Appalachian Mountains of southwestern Virginia. With 520 square miles, Tazewell County and the surrounding region are known for their agriculture, historical, resource, and cultural significance.

The initial settlers of the land were indigenous people known as the Woodland Indians. There are few known details about the early inhabitants of the area. Artifacts have been found across the county indicating they were an organized society of people and groups. The Woodland Indians were no longer in the area when the pioneers and European Settlers arrived. At that time, the Cherokee and Shawnee tribes were using the lands as hunting grounds.[1] After the first European colony was established in Jamestown, settlers including professional hunters who exported animal pelts to Europe, hunted large herds of deer, elk, buffalo, and other game in the region.[2]

The first permanent European settler in Tazewell County is believed to arrive in 1770.[3] Most of the early settlers were of Scotch-Irish descent and arrived via the Wilderness Trail. James Burke, operating under the Woods River Company, led the first land survey of Tazewell County in 1749. The survey expedition mapped the headwaters of the Clinch River, Maiden Spring, and Dry Branch near today's Russell County.[4] Tazewell County, chartered on December 19, 1799, was named in honor of Senator Henry Tazewell who made the motion to create the county. It was formed from Russell and Wythe Counties.

Tazewell County in its early formation and into the 19th century had a lower population than surrounding counties. The low population could be attributed to distance from the great migration road westward,

---

[1] Ibid.

[2] Ibid.

[3] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. [2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)]

[4] Ibid.

hostile encounters with Native American tribes in this area, and difficulty securing clear title to land due to large-scale land speculation of the times. Historic sites, monuments, and museums reflect the community's link to pioneer and Native American ancestors throughout the region.[5]

The economic base in Tazewell County's early history was primarily agricultural uses. In the 1880s, coal started being mined commercially in Tazewell County.[6] Coal mining rapidly expanded in the 1930s with the establishment of railroads for transporting coal. The economy in Tazewell County shifted to primarily mining and mining-related industries which peaked in 1990. As the rural Appalachia region in Southwest Virginia saw downward trends in the region's primary economic sectors of mining, manufacturing, and agriculture, the entire region collaborated in the early 2000s to develop a branding/marketing campaign under the Southwest Virginia Cultural Heritage Foundation.[7]

A recent economic revitalization study was prepared in September 2021. The Cumberland Plateau Planning District Commission Roadmap to Economic Resiliency Study charts a path forward for business and tourism resiliency in the region. Recommendations underway include making the region more attractive to a migrating workforce, eliminating blight, and advertising the community for potential relocation.[8]

Tazewell County is governed by a five-member Board of Supervisors which represent the County's five magisterial districts. Incorporated towns within Tazewell County include Bluefield, Cedar Bluff, Pocahontas, Richlands, and Tazewell.[9] In addition, Tazewell County has approximately twenty unincorporated communities and four census-designated places.

Geography and Climate

Tazewell County is located in the north central portion of southwestern Virginia. The county lies within the valley and ridge portions of the Appalachian Mountains on the southeast with the Cumberland Plateau and Allegheny Mountains on the northeast. Tazewell County is bordered by West Virginia on the north, Buchanan County and Russell County on the west, Smyth County on the south, and Bland County on the east (Figure 4-1). It is one of four counties that comprise the Cumberland Plateau Planning District. Tazewell County is 520 square miles (the 20th largest out of 95 Counties and 39 Independent Cities in Virginia) and represents 27.5 percent of the total land area of the district.[10] The county's incorporated municipalities include the Town of Bluefield, the Town of Cedar Bluff, the Town of

[5] Ibid.

[6] U.S. Geological Survey Bulletin. Coal Resources of Tazewell County, Virginia, 1980. Retrieved July 7, 2023, https://pubs.usgs.gov/bul/1913/report.pdf

[7] Southwest Virginia Economic Analysis Report. Retrieved March 13, 2023. https://cppdc.com/wp-content/uploads/2022/07/SWVA-Economic-Analysis-Report.pdf

[8] Cumberland Plateau Planning District Commission Roadmap to Economic Resiliency September 2021. Retrieved March 17, 2023. https://cppdc.com/wp-content/uploads/2022/07/Cumberland-Plateau-PDC-Roadmap-to-Economic-Resiliency.pdf

[9] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. 2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)

[10] Tazewell County Comprehensive Plan 2017. Retrieved February 13, 2023 from http://cppdc.com/Reports/Tazewell%20Comp%20Plan%202017.pdf

Pocahontas, the Town of Richlands, and the Town of Tazewell, which is the county seat. The incorporated towns are labeled with bold font in Figure 4-1.

Tazewell County maintains a continental climate, characterized by hot summers and cold winters. The average high is around 82 degrees in July, and the average low is 22 degrees in January. In addition, the county averages 42 inches of rain a year, 4 inches above the U.S. average of 38 inches. July is the most saturated month in Tazewell County with an average of 4.5 inches of rain, and the driest month is October with 2.5 inches.[11] Storms occur throughout the year in Tazewell County. In the mid-spring through early fall, Tazewell County faces more localized storms with large amounts of precipitation in a short period of time. From late fall to middle spring, Tazewell County faces slower moving storms with moderate precipitation. The climate in relation to flooding is discussed further in **Section 6: Risk Assessment**.

Since recording began in 1953, Tazewell County has experienced 21 presidential disaster declarations, including nine severe storms, five snowstorms, three hurricanes, one flood, and three other related disasters. After experiencing a hiatus in disasters from 2012 to 2017, the County has seen at least one disaster every other year. More recently, in July of 2022, the County experienced a flooding and mudslides disaster. The funding obligations for this incident accounted for approximately $1.3 million in Public Assistance grants from the federal government.[12]

[11] NOAA Online Weather Data for Tazewell County, VA. Retrieved from Climate (weather.gov)

[12] FEMA. Disaster Declarations by State and County. Retrieved from Disaster Declarations for States and Counties | FEMA.gov.

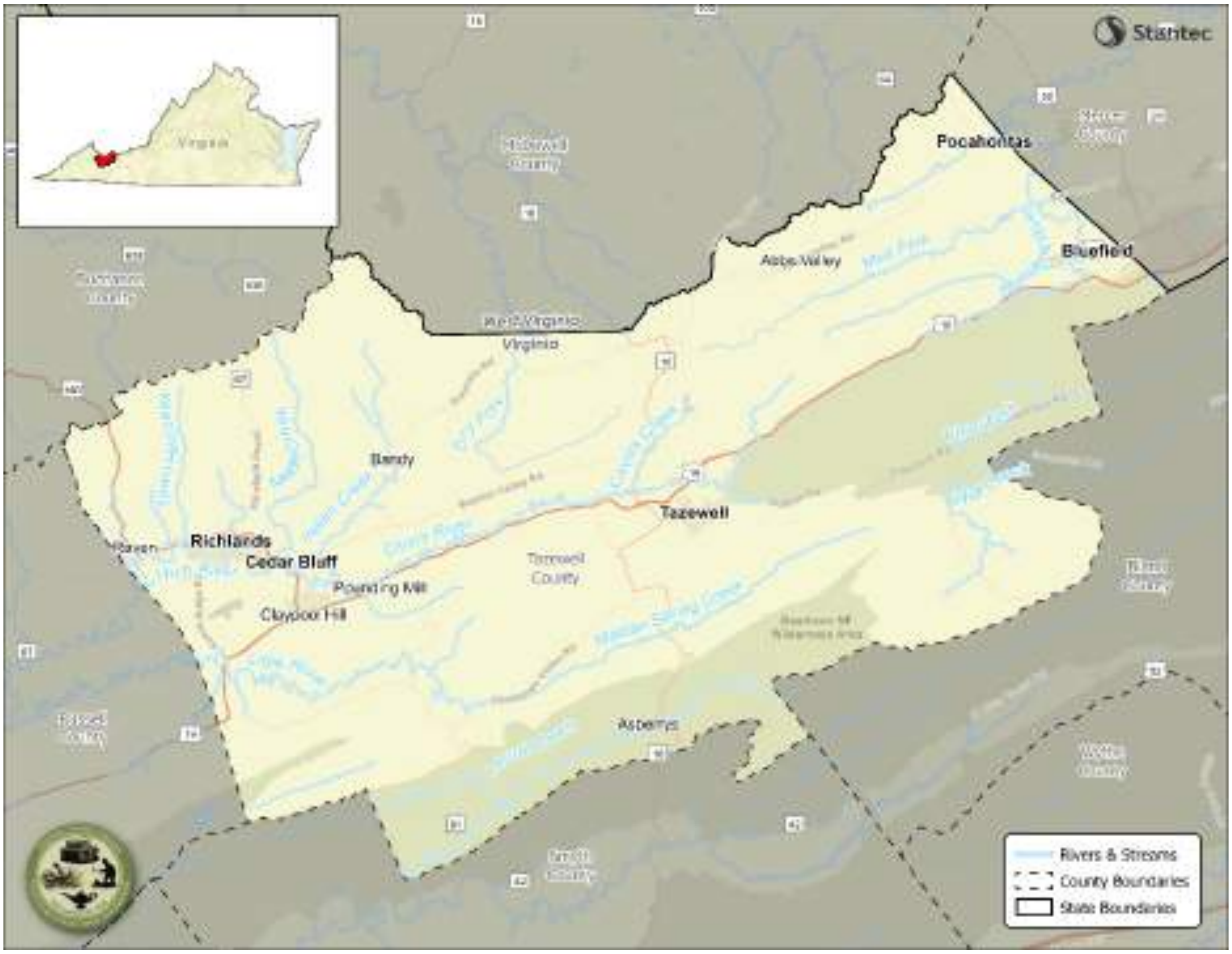


Figure 4-1: Location Map - Tazewell County, Virginia

Topography

Elevation in the valley areas of the county ranges from 1,900 feet in the western and southeastern areas to 2,763 in the east central areas.[13] Uneven terrain is traversed by streams and sinkholes characteristic of a karst landscape. The topography ranges from sloping to hilly and steep with few areas of smooth and rolling sections across the county. The scenic mountains range from 2,500 to 4,500 feet of elevation with higher irregular peaks. While the mountains provide scenic vistas for residents and visitors, they pose a challenge to the installation of infrastructure and structural development throughout the county. Forested uplands and agriculture remain the predominant land uses for the hill and valley areas.[14]

Population and Demographics

As of 2020, Tazewell County had a population of approximately 40,429 residents, with a population density of 78 people per square mile. Since 2010, Tazewell County's population changed drastically with

---

[13] Tazewell County Comprehensive Plan 2017. Retrieved February 13, 2023 from http://cppdc.com/Reports/Tazewell%20Comp%20Plan%202017.pdf

[14] Tazewell County Comprehensive Plan 2017. Retrieved February 13, 2023 from http://cppdc.com/Reports/Tazewell%20Comp%20Plan%202017.pdf

a decline of approximately 4,600 residents. This number is a significantly larger decrease in population from prior previous decades. Table 4-1 below presents population statistics for Tazewell County and the incorporated areas within from the U.S. Census Bureau for 1990, 2000, 2010, and 2020.

Table 4-1: US Census Population Counts

	1990	2000	2010	2020	Percent Change 1990 - 2020
Town of Bluefield	5,371	5,100	5,444	5,096	-5%
Town of Cedar Bluff	1,759	1,050	1,137	1,069	-39%
Town of Pocahontas	510	453	389	268	-47%
Town of Richlands	4,506	4,206	5,823	5,261	+17%
Town of Tazewell	4,273	4,113	4,627	4,486	+5%
Tazewell County	45,968	44,598	45,078	40,429	-12%

Source: U.S. Census Bureau

Based on the 2020 Census, the median age of residents is 45 years old. Table 4-2 presents the county's racial characteristics from the 2020 Census. 92.8% of residents identify as White, 2.4% as Black, and 1.1% as Hispanic.

Table 4-2: 2020 Race Demographics for Tazewell County

	White	Black	Multiracial	Asian	American Indian and Alaska Native	Hispanic Origin*
Town of Bluefield	83.9%	7.1%	5.7%	1.8%	0.2%	3.1%
Town of Cedar Bluff	95.3%	0.4%	2.9%	0.5%	0.1%	0.0%
Town of Pocahontas	92.9%	1.5%	5.2%	0.0%	0.0%	0.0%
Town of Richlands	94.9%	0.5%	3.3%	0.7%	0.2%	0.1%
Town of Tazewell	89.5%	4.7%	4.6%	0.6%	0.2%	0.2%
Tazewell County	92.8%	2.4%	3.6%	0.5%	0.1%	1.1%

**Hispanics may be of any race, so also are included in applicable race categories.*
Source: U.S. Census Bureau[15]

Socially Vulnerable Populations

Social vulnerability refers to the potential adverse impacts on social groups including death, injury, loss, or disruption of livelihood caused by external stresses on human life.[16] Several factors can contribute to increasing the vulnerability of communities to natural disasters such as flooding. Examples include age, income, employment status, or race, as well as access to day-to-day resources such as vehicles, telephones, and broadband internet. Having high social vulnerability makes it more challenging for individuals to prepare, respond, recover, and adapt to disasters. Due to the mixture of factors increasing social vulnerability, both federal and state agencies have developed indices that highlight social vulnerability at the county or census tract level.

The Center for Disease Control's (CDC's) Social Vulnerability Index (SVI) is frequently used for federal grant applications. The CDC's SVI utilizes 16 census variables to establish an index score that highlights the social vulnerability of each county or census tract within the county. The data includes poverty, lack of vehicle access, and crowded housing, among others. The 2020 SVI score, the most recent data available for Tazewell County at the statewide level is 0.69 on a 0 (lowest vulnerability) to 1 (highest vulnerability) scale. This SVI score indicates that Tazewell County has a medium to a high level of vulnerability. The score is most impacted by Tazewell's scores in socioeconomic status, household characteristics, and housing type/transportation options. When evaluating the data at the census tract level, most of the tracts are identified as areas that have "medium-high" levels of vulnerability. In addition, there are two census tracts on the western boundary of the county and abutting Buchanan and Russell County that are within the "high" level of social vulnerability (census tracts 209 and 210) and one

---

[15] United States Census Bureau. (n.d.) QuickFacts: Tazewell County, Virginia; United States. Retrieved March 2, 2023, from U.S. [Census Bureau QuickFacts: Tazewell County, Virginia.]

[16] FEMA National Risk Index.

census tract on the eastern boundary that is a "low-medium" level of social vulnerability (census tract 211.02).[17] The social vulnerability by census tract is shown in Figure 4-2.

According to the Virginia Department of Housing and Community Development (DHCD), there are two Opportunity Zones (OZ) within Tazewell County. One is located along the northeast side of the county (census tract 202) and the other is located along the southern quadrant of the county (census tract 206). OZs are a federal economic and community development tax benefit designed to encourage long-term private investment in low-income urban, suburban, and rural census tracts. OZs were nominated by each governor in the spring of 2018 and are comprised of low-income census tracts, based on 2015-16 American Community Survey data. Virginia, which had 901 eligible census tracts, was able to nominate 25% of these tracts for certification by the U.S. Department of Treasury, per the Tax and Jobs Act. The designations are permanent through December 31, 2028.[18]

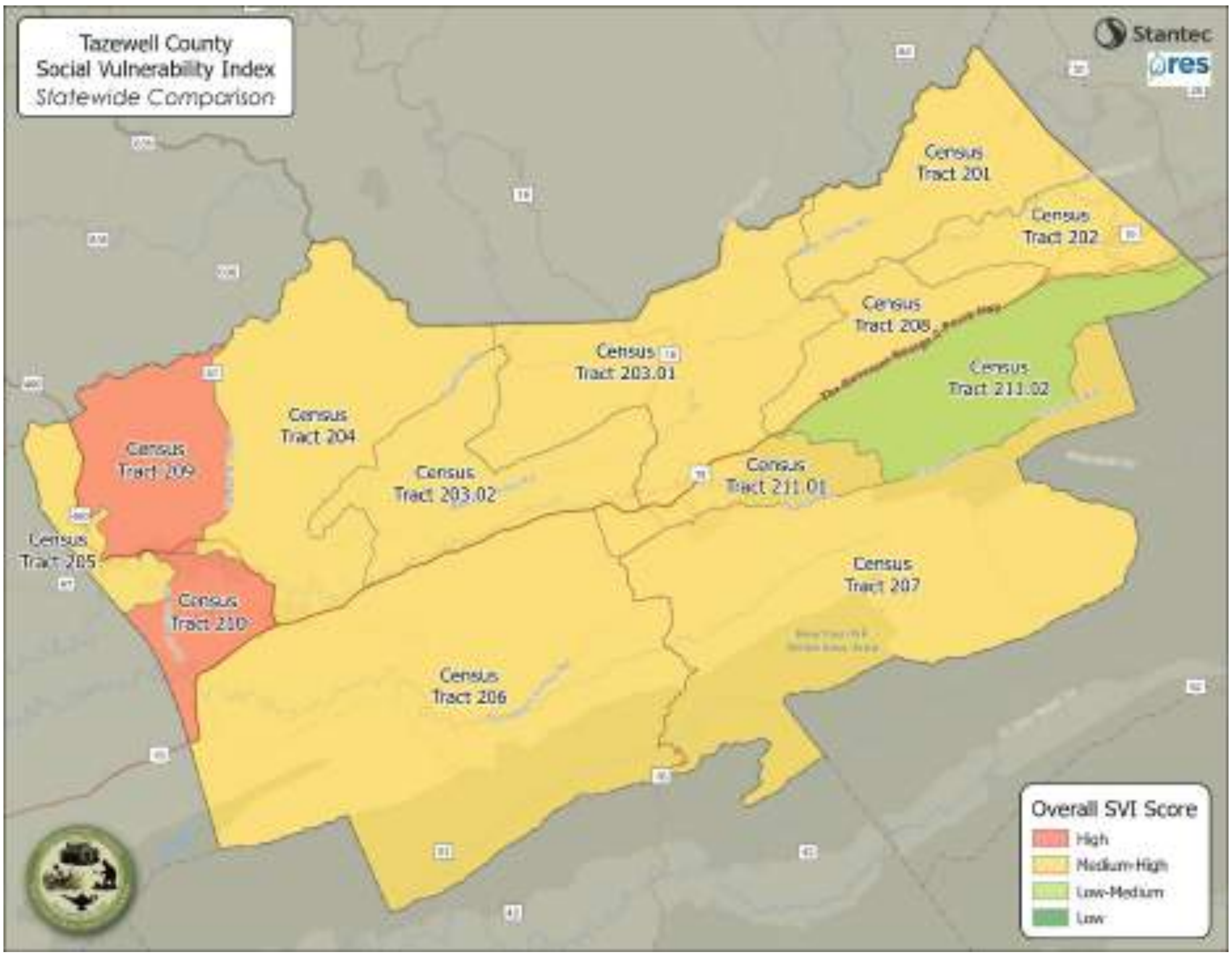


Figure 4-2: Social Vulnerability by Census Tract

[17] Center of Disease Control. Retrieved from [CDC/ATSDR Social Vulnerability Index (SVI) | Place and Health | ATSDR]

[18] Virginia DHCD. Opportunity Zones. Retrieved from [Opportunity Zones (OZ) | DHCD (virginia.gov)].

Economy and Industry

The region's abundant natural resources and economic sectors of manufacturing, mining, and agriculture have significantly declined over the last four decades. Once railroads were upgraded and expanded in the 1930s, the mining industry took off and remained very profitable until the 1960s. After a lull in production, coal resurged in southwest Virginia during the 1980s and reached peak production in 1990, when the state produced 46.5 million tons of coal. However, since then coal production has declined drastically. The number of licensed mines in Virginia in 1980 was over 800; by 2001 that number was down to 328.[19] The decrease in coal production can be attributed to several factors. First, coal reserves in the area are largely depleted after years of mining. Second, the remaining coal seams in the Appalachians are relatively thin compared to mines in the western U.S. and require costly underground mining. Lastly, coal prices declined over the past 15 years, decreasing profit margins and further increasing automation.

Current regional economic growth focuses on the mission of Virginia's e-Region, promoting jobs in the electronic information technology, energy, education, and emerging specialty manufacturing industries.[20] In an effort to diversify the economic base of the economy and support new business and industrial facilities, basic infrastructure projects and the installation of fiber optic cabling have been underway. Additional access and availability of funding to improve infrastructure, incentivize local businesses, and market the community are necessary for continued economic growth in Tazewell County and the region.[21]

Leveraging Natural Resources

Tazewell County historically depended on natural resources such as lumber, coal, and shale as a driving force for the local economy. Even as the county incorporates additional sources of revenue, natural resources will likely continue to play a key role moving forward. Solar energy presents a potential revenue-generating source for the county. The Nature Conservancy, in partnership with Dominion Energy and Sun Tribe, is developing solar farms on six abandoned mines in Southwest Virginia.[22] This creates jobs in the short term and provides cheap, renewable energy in the long term. Moreover, the CPPDC is participating in the Southwest Virginia Solar Workgroup to develop residential and utility-scale solar projects in the region.

Revitalizing agriculture in the region is another means of utilizing natural resources to support the local economy. Demand for local, hormone-free, grass-fed livestock has renewed interest in agriculture education in the region's schools and farming as an occupation.

---

[19] Virginia Center for Coal and Energy Research. (n.d.) Virginia Coal. Virginia Polytechnic Institute and State University. Retrieved March 14, 2023 from https://vept.energy.vt.edu/coal.html#:~:text=Virginia%27s%20peak%20production%20year%20was,declined%20to%2031%20million%20tons.

[20] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. 2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)

[21] Ibid.

[22] Murphy, Zoeann. (2022). In Virginia, abandoned coal mines are transformed into solar farms. The Washington Post. Retrieved August 11, 2022 from https://www.washingtonpost.com/climate-solutions/2022/03/03/coal-mines-solar-farms-climate-change-video/

Presently, tourism and cultural heritage stimulate the local economy with the Nature Conservancy identifying the Clinch River Basin as one of twenty "Last Great Places" along with the Historic Crab Orchard Museum, the Tazewell County Old Time Bluegrass Fiddlers' Convention, Pocahontas Exhibition Coal Mine and Museum, Burke's Garden, and the Appalachian Trail. Burke's Garden, visible from space and known as "God's Thumbprint," is a unique massive bowl formed by a mountain collapsing in on itself.[23] Outdoor recreation produces local tax dollars while maintaining the region's natural beauty. According to the Bureau of Economic Analysis, U.S. Department of Commerce, outdoor recreation accounts for 1.6% of Virginia's Gross Domestic Product totaling $9.4 billion annually.

Transportation

Tazewell County, located in southwest Virginia is near the borders of West Virginia, Kentucky, and Tennessee. Major highways connecting the towns of Richlands, Tazewell, and Bluefield include US Routes 460 and 19. Connections to economic centers in Tennessee, Kentucky, West Virginia, and other parts of Virginia are made by Interstates 81 and 77 which run 30 miles south of Tazewell's southern border.

In recent years, the Commonwealth Transportation Board has prioritized updating and repairing the bridges in Tazewell County many of which were constructed in the 1970s. In addition, repairs have been made to State Roads 696 and 747 improving the safety of those roadways. Regional improvements outside the county limits but beneficial to the county, have included I-73 and the "Coal Fields Expressway".

The Tazewell Airport has the capacity to provide relief in the wake of natural disasters such as floods. Local police, Civil Air Patrol, and the National Guard utilize the airfield for the detection and suppression of forest fires, chemical spills, and other natural or man-made disasters. The airport has small plane capabilities, a 4,300-foot runway, and instrument landing capability for single and twin-engine general aviation uses.[24]

Norfolk Southern Railroad and CSX Transportation provide local rail services mainly for the export of coal. The closest passenger rail service is an Amtrak station an hour away in Hinton, Virginia.[25]

Greyhound-Trailways, Four County Transit, and Graham Transit provide bus service in the county.

Flood Overview

The steep topography of the county causes precipitation to drain quickly, and at high velocities, which can lead to rapid flooding following moderate or heavy rainfall. Quick-moving floodwaters may increase the potential for damages as the force of moving water pushes buildings off foundations and carries other large items, such as vehicles, trees, and bridges, downstream. Flooding can also occur if there is rapid snowmelt. In addition to the steep terrain, the large number of smaller tributaries feeding into the region's larger streams and rivers creates a large influx of water during a rain event. The combination of

---

[23] Burke's Garde. Virginia DWR website. Accessed March 15, 2023. https://dwr.virginia.gov/vbwt/sites/burkes-garden/

[24] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. 2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)

[25] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. 2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)

fast-moving runoff and the large volume of water can easily lead to flash flooding, leaving residents in the floodplains with little warning to evacuate.

The Clinch River, as it traverses through Tazewell and Russell Counties, has a drainage area of approximately 670 square miles. Multiple tributaries flow into the Clinch River including the Guest River flowing from the northwest and the Little River flowing from the east near the headwaters in Tazewell County. The mountainous terrain's steep slopes increase rapid flooding conditions following significant rainfalls or spring snowmelts.[26]

Impervious surfaces associated with commercial and residential buildings, encroaching roadways and railways, and restricted flow from bridges all contribute to increased flood heights and increased water velocities during storm events. Most of the damage during flood events is to the contents of basements in the area, as well as the roads and railways that line the local waterways. However, in larger storm events, fast-moving water can wash out large sections of roadway, cause serious structural damage to permanent buildings, and push homes, especially mobile or modular homes, off their foundations, leading to serious injuries and loss of life.

The CPPDC's Hazard Mitigation Plan, last updated in 2018, details the flood occurrences along the Clinch River dating back to 1862. The primary data source for flood level measurements is a USGS gauge located Cleveland, Virginia. Additional USGS surface peak streamflow gauge data is available for the Bluestone River at Falls Mills, Virginia. The NOAA National Centers for Environmental Information (NCEI) Storm Events Database reported twenty-one additional flood events that caused either damage to homes or injuries/fatalities since 2002. Table 4-3 shows a full accounting of the forty-two flood events documented in the CPPDC's Hazard Mitigation Plan, the NCEI Storm Events Database, and/or presidential disaster declarations.

---

[26] Cumberland Plateau Planning District Commission Hazard Mitigation Update September 2018. Accessed March 16, 2023. https://cppdc.com/wp-content/uploads/2022/07/Hazard-Mitigation-Plan.pdf

Table 4-3: Previous Flood Occurrences in Tazewell County

Occurrence	Location	Source(s)
February 22, 1862	Clinch River Area	CPPDC HMP
February 22, 1867	Clinch River Area	CPPDC HMP
June 22, 1901	Entire River	CPPDC HMP
March 1, 1902	Clinch River Area	CPPDC HMP
November 20, 1906	Clinch River Area	CPPDC HMP
June 14, 1907	Clinch River Valley	CPPDC HMP
April 3, 1912	Clinch River Area	CPPDC HMP
April 1, 1913	Clinch River Area	CPPDC HMP
March 5, 1917	Lower Clinch Area	CPPDC HMP
January 29, 1918	Clinch River	CPPDC HMP
February 3, 1923	Clinch River	CPPDC HMP
June 13, 1923	Clinch River	CPPDC HMP
December 22, 1926	Clinch River Area	CPPDC HMP
August 14, 1940	Clinch River Basin	CPPDC HMP
January 30, 1957	Clinch River	CPPDC HMP
May 7, 1958	Clinch River	CPPDC HMP
March 12, 1963	Clinch River	CPPDC HMP
March 17, 1973	Clinch River Area	CPPDC HMP
January 26, 1978	Clinch River	CPPDC HMP
January 23, 2002	Wardell	NOAA/NCEI
March 18, 2002	Countywide	NOAA/NCEI
February 16, 2003	Clinch River Area	CPPDC HMP
November 19, 2003	Countywide	NOAA/NCEI
February 28, 2011	McCall Place, Bandy, Adria, Richlands	NOAA/NCEI
April 26, 2012	Richlands	NOAA/NCEI
May 22, 2012	Bluefield	NOAA/NCEI
March 4, 2015	Red Ash	NOAA/NCEI
April 23, 2017	Raven	NOAA/NCEI
June 16, 2017	Bluefield	NOAA/NCEI
February 11, 2018	Richlands	NOAA/NCEI
April 16, 2018	Cedar Bluff	NOAA/NCEI
September 10, 2018	Bluefield	NOAA/NCEI

Occurrence	Location	Source(s)
December 21, 2018	Richlands	NOAA/NCEI
February 20, 2019	Bluefield, Cedar Bluff, Pisgah, Hockman	NOAA/NCEI
February 6, 2020	Countywide	State Declared Emergency, NOAA/NCEI
April 13, 2020	Pounding Mill	NOAA/NCEI
March 1, 2021	Richlands	NOAA/NCEI
January 2, 2022	Cedar Bluff	NOAA/NCEI
May 24, 2022	Falls Mills	NOAA/NCEI
July 12, 2022	Mouth of Laurel, Jewell Ridge, and Burkes Garden	NOAA/NCEI
August 5, 2022	Richlands	NOAA/NCEI
February 17, 2023	Countywide	Local News

Note: The table does not include flash flood events.

To supplement the historical record of flooding events, County officials identified ten initial flooding hotspots within the county during project scoping. Table 4-4 presents these initial flood hotspots, which are assessed further in Section 6: Risk Assessment. Figure 4-3 shows flooding from the Clinch River at the Raven hotspot.

Table 4-4: Tazewell County Flood Hotspots

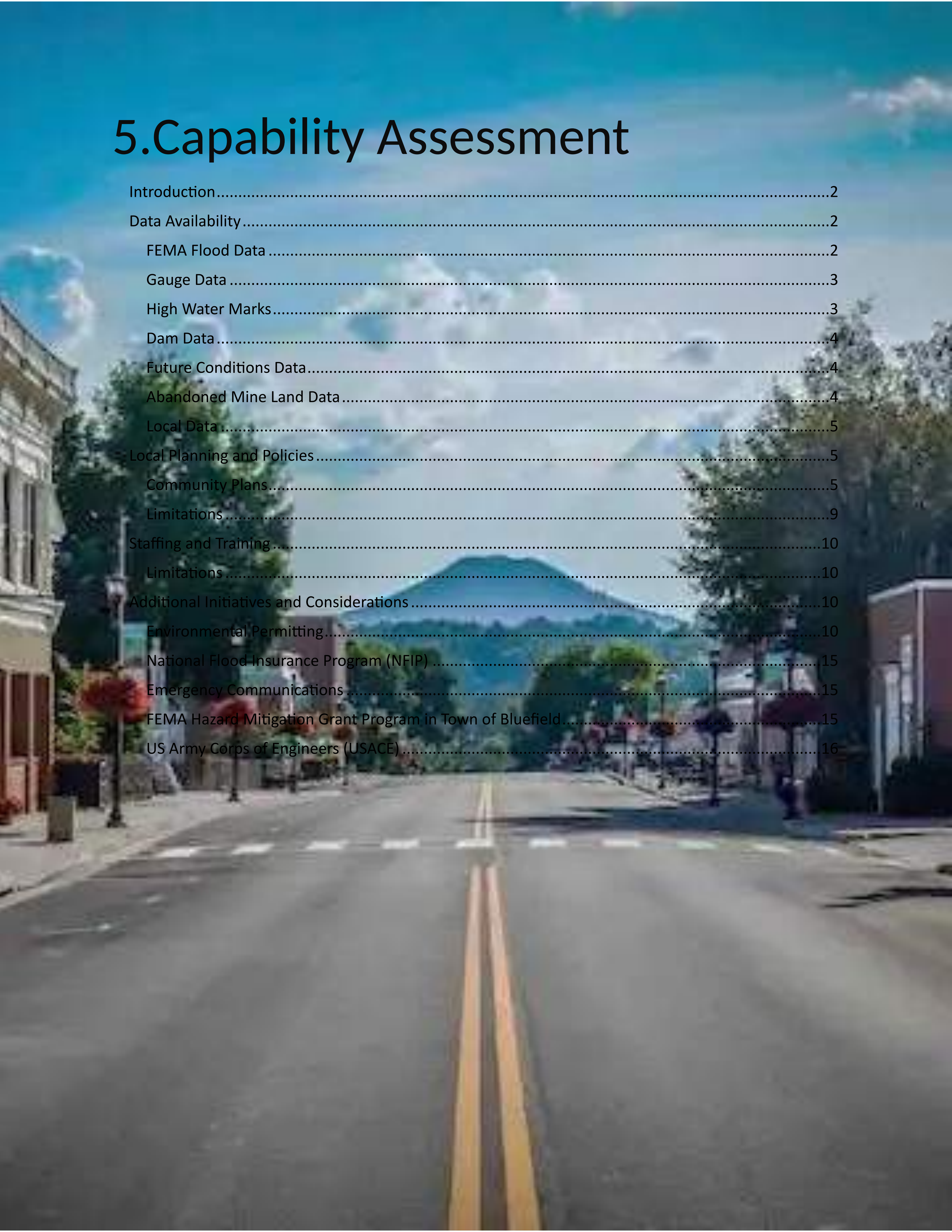
Location
Clinch River in Raven
Clinch River at Plant Road near Richlands
Clinch River near Patton Street
Clinch River in Richlands
Big Creek in Richlands
Indian Creek at Banes Bottom
Indian Creek Near Cedar Bluff
Clinch River near Tazewell Wastewater Treatment Plant
North Fork Clinch River near Freedom Avenue
Bluestone River near Falls Mills

Figure 4-3: National Guard Rescue from Flood - February 6, 2020
Photo: Courtesy Donna Whittington

In addition to the flooding hotpots, abandoned mines present a unique flooding hazard. Portals (entry tunnels) into the abandoned mines can flood and overflow. This can lead to a mine blowout or a landslide. Flood risks associated with abandoned mines are further addressed in Section 6: Risk Assessment.

Summary

In conclusion, this Appalachian Mountain community depends on agriculture, historic, cultural, and natural resources. The steep elevations and karst landscape provide challenges for physical growth and expansion of infrastructure. The population has steadily decreased since 1990 corresponding to the decline of the coal industry in the region. However, there are economic redevelopment efforts focused on business and tourism resiliency. Flood risk presents a challenge to these efforts, as well as maintaining life safety and quality of life within the county. There have been forty-two reported flood occurrences in Tazewell County with twenty-one occurring since 2002. The highest number of annual flood occurrences was in 2022. Flood mitigation actions are necessary to preserve and protect the residents and existing industry within Tazewell County and the incorporated areas within and make it an attractive community for future economic investment and industry.



5.Capability Assessment

Introduction

The purpose of conducting a capability and capacity assessment is to determine the ability of a local jurisdiction to identify and implement policies, programs, or projects that reduce flood risk. As in any planning process, it is important to try to establish which actions are feasible based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability and capacity assessment helps to determine which flood risk reduction activities are practical, and likely to be implemented over time, given a local government's planning and regulatory framework, level of administrative and technical support, fiscal resources, and current political climate. Information for the capability and capacity assessment was gathered from County officials during Planning Team meetings and targeted stakeholder interviews.

A capability and capacity assessment has two components: 1) an inventory of a local jurisdiction's relevant plans, ordinances, or programs already in place and 2) an analysis of its capacity to carry them out. It includes, reviewing available flood-related data, plans, policies, and staffing capabilities, as well as providing recommendations for revisions or new policies to enhance the County's capability in floodplain management. The assessment also involves reviewing policy, including identified incentives for restoring or preserving riparian and wetland vegetation. Careful examination of local capabilities will identify existing gaps, shortfalls, or limitations with ongoing government activities that could hinder proposed flood risk reduction activities and possibly exacerbate community flood vulnerability. A capability and capacity assessment also highlights the positive measures already in place or being implemented at the local government level, which should continue to be supported and enhanced.

Recommended actions will support a long-term strategy to build capacity and capabilities. Examples include regular staff training, budget allocations to support staff in implementing the plan, and supporting a staff person in obtaining and maintaining Certified Floodplain Manager (CFM) certification. Flood risk reduction actions and projects, including those identified to maintain and enhance county capability and capacity, are presented in *Section 7: Flood Risk Reduction Action Plan*.

Data Availability

Relevant data, such as flood risk studies, maps, and gauge information, help communities understand flood risk by providing information regarding the location, severity, and likelihood of potential flood events. Further, local data, such as building and asset data, can be assessed alongside flood data to understand a community's vulnerability to flooding. Therefore, data availability is directly linked to a community's capability to understand flood risk, as well as to develop and implement strategies to effectively reduce future flood risk. As part of the planning process, flood-related data was collected from local, state, and federal sources to inform capability. This data was also used in *Section 6: Risk Assessment*, to better understand flood risk within Tazewell County. A summary of available flood data sources is provided below.

FEMA Flood Data[1]

Regulatory Flood Insurance Rate Maps (FIRMs) show the location of the mapped 100-year and 500-year floodplains in Tazewell County and are used for flood insurance. The latest FIRM for Tazewell County

[1] FEMA Map Service Center. FEMA Flood Map Service Center | Search All Products.

became effective in 2011. Small portions of the county's FIRM have been updated more recently, with the most recent revision being in 2021.

Flood risk products (FRPs) are non-regulatory and are used for community planning and emergency preparedness purposes. In 2014, FEMA and the US Army Corps of Engineers completed a Flood Risk Study for the Tug Fork Watershed, which includes Tazewell County. The Flood Risk Study includes depth grids and percent chance of flooding grids (annual and 30-year). The report states that flash flooding continues to be a reoccurring threat to homes, infrastructure, and public safety.[2]

The county would benefit from depth and velocity grids for the entire county, especially considering noted issues with houses and mobile homes being swept off their foundations and carried downstream during flood events.

Gauge Data

There is one USGS stream gauge located within Tazewell County. It is located on the Bluestone River at Falls Mills near the West Virginia border. A second stream gauge, located in Cleveland, VA in neighboring Russell County, was used to provide historical stream flow data for the Clinch River. The Clinch River originates within Tazewell County and flows through most of the County's more populated towns and cities. The measurements from these gauges are further detailed in *Section 6: Risk Assessment*. Prior gauge data for the region included IFLOW rain and stream gauges.[3] This program has been temporarily suspended due to a lack of VDEM funding. It is anticipated that this system will be restored in the future.

In its current state, the network of stream and rain gauges in the county provides little benefit in terms of emergency management and warning. An expanded network of stream and rain gauges that update in real-time can provide a warning when flood stages are being approached. Further, information gathered by gauges can be used to understand the extent and severity of extreme rainfall events and can be used in floodplain mapping.

High Water Marks

High water marks, or visible lines that show the location and height of floodwaters after they have retreated, can be used to determine the extent and severity of the flooding. Unfortunately, high water mark data was not available for Tazewell County. For future planning, project, and funding purposes, it is recommended that they be collected and documented in a geospatial data format.

Without high water marks from previous flood events, future updates to flood maps may not accurately reflect the severity and extent of flooding in Tazewell County. A process for collecting high water marks after flood events and storing data in geospatial format would enhance the county's ability to plan for flood risk reduction and work with state and federal agencies to develop accurate flood risk data.

---

[2] Flood Risk Report Tug fork Water, HUC 05070201. FEMA. Retrieved April 11, 2023. [Flood Risk Report Tug Fork Watershed].

[3] Virginia Flood Observation and Warning Network. [Virginia Flood Observation and Warning Network (mtiv-tools.com)].

Dam Data

The U.S. Army Corp of Engineers (USACE) National Inventory of Dams (NID) lists five dams within Tazewell County, and 11 dams within 10 miles of the county.[4] USACE classifies a dam's hazard potential based on the potential of a dam to affect the safety and health of citizens and property, should the dam fail. This is separate from the condition of the dam, and only assesses the potential consequences of a dam failure. Analysis of the dam's hazard and condition are detailed in *Section 6: Risk Assessment.*

Future Conditions Data

Future conditions data helps communities understand how their flood risk may change over time. Tazewell County is expected to experience increased annual precipitation in the future, including more severe extreme rainfall events. While the county does not have future rainfall or flood data developed from downscaled climate models, national sources and tools such as the National Climate Assessment, NOAA's Climate Mapping for Resilience and Adaption, Headwaters Economics Neighborhoods at Risk, EPA's EJScreen, FEMA's National Risk Index, and USACE studies are available to understand future conditions associated with flood risk.

Future flood risk data developed specifically for Tazewell County, such as changes in the severity and frequency of extreme rainfall events, may help the county better plan to reduce future flood risk. For example, capital projects and infrastructure can be constructed to withstand projected future events rather than those of the past.

Abandoned Mine Land Data

Tazewell County has abandoned mines distributed throughout the county. Abandoned mines pose a threat due to flooding from "blowouts," when mines fill with water during extreme rainfall events and burst, resulting in large volumes of water cascading down steep slopes into valleys below. These events are difficult to predict and can also result in landslides and mudflows. While many abandoned land mines have been mapped and rehabilitated, many remain unmapped throughout the county. According to County officials, the Virginia Department of Energy (DOE), formerly the Department of Mines Minerals and Energy (DMME), located and mapped many abandoned mines in the 1970s however unlocated abandoned mines may exist throughout Tazewell County. DOE maintains an online mapping tool to show the location of known abandoned mines and associated impacts.[5] The presence of unknown, unmapped abandoned mines makes it difficult for County officials to predict where mine blowouts may occur and makes it challenging to differentiate between flood events caused by extreme rainfall alone and those exacerbated by mine blowouts.

Tazewell County does not have a complete inventory of abandoned mines within the county. Although the DOE has made significant progress in mapping abandoned mines, a complete survey of the county for unmapped abandoned mines would allow the county to work with local, regional, and state entities to understand where flood risk may be increased due to the presence of abandoned mines and to mitigate potential effects of flooding associated with mine blowouts.

---

[4] Dams of Tazewell County, Virginia. U.S. Army Corps of Engineers. Retrieved April 11. 2023. [National Inventory of Dams (army.mil)]

[5] Virginia DMME. [Virginia Abandoned Coal Mine Feature Inventory (arcgis.com)].

Local Data

Local building and community asset data was collected as part of the planning process to better inform risk. The County maintains geospatial data which includes building footprints, as well as parcel and value data used for tax assessment purposes. More information about how available data was used to assess flood risk is detailed in *Section 6: Risk Assessment*.

The county would benefit from an inventory of digitized building footprints that include attributes such as use, building age and material, first flood elevation, number of stories, and improvement value. This information can be used to understand building-specific vulnerability to flooding.

Local Planning and Policies

Planning and regulatory capability are based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development, and redevelopment while maintaining the general welfare of the community. It includes emergency response and hazard mitigation planning, comprehensive land use planning, and transportation planning, as well as enforcement of ordinances and building codes, and protection of environmental, historic, and cultural resources in the community. Although conflicts can arise, these planning initiatives present significant opportunities to integrate flood risk reduction principles into the local decision-making process.

Community Plans

In Tazewell County, plans are developed by both the County and the Cumberland Plateau Planning District Commission (CPPDC). The CPPDC is a regional body that provides planning technical assistance to Buchanan, Dickenson, Russell, and Tazewell Counties. Table 5-1 provides a summary of plans for Tazewell County.

Table 5-1: Tazewell County Summary of Plans

Plan Title	Purpose
Tazewell County Comprehensive Plan	A comprehensive plan serves as a broad policy guide to assist in the decisions necessary for future development and redevelopment.
Tazewell County 2021 Emergency Operations Plan (EOP)	An EOP outlines responsibilities and how resources are deployed during and following an emergency or disaster.
CPPDC 2021 Comprehensive Economic Development Strategy (CEDS)	A CEDS contributes to effective economic development through a locally based, regionally driven economic development planning process. A CEDS is intended to implement economic development planning by engaging community leaders, leveraging the involvement of the private sector, and establishing a strategic blueprint for regional collaboration.
CPPDC Coalfields Regional Water Study	The purpose of the Virginia Coalfields Regional Water Study is to develop and evaluate, without regard to geographical or political boundaries, alternatives for regionalized water systems capable of providing water service to previously unserved areas and improving service to areas currently served.
CPPDC 2018 Hazard Mitigation Plan	A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. A community must have a current hazard mitigation plan to qualify for FEMA Hazard Mitigation Assistance (HMA) funding opportunities. Aligning risk reduction actions within this flood resilience plan with the community's hazard mitigation plan may expand funding opportunities for flood mitigation within the County.
CPPDC Southwest Virginia Regional Wastewater Study	The Southwest Virginia Regional Wastewater Study is intended to serve as a road map for the future implementation of sanitary sewer collection, treatment, and disposal projects in Southwest Virginia.
CPPDC Southwest Virginia Regional Water Supply Plan	The Southwest Virginia Regional Water Supply Plan was developed to follow the State Water Control Board's regulation 9 VAC 25-780, Local and Regional Water Supply Planning. The plan addresses water sources, water use, and natural resources in the region as well as water demand management information, and drought response and contingency planning.
CPPDC Southwest Virginia Economic Analysis Report	This report assesses economic development trends in Southwestern Virginia, including the growth of the "creative economy," general economic trends, talent and human capital, recreation, and quality of life.

In addition to plans already in place, several types of plans that have not been developed or implemented by the county or CPPDC were identified that have the potential to reduce flood risk. These present potential opportunities to enhance flood resilience within the county. These plans include:

- **Disaster Recovery Plan:** A Disaster Recovery Plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- **Emergency Evacuation Plan** – Evacuation Plans pre-determine safe evacuation routes for residents to relocate out of harm's way during a disaster. Having an evacuation plan before a flood event not only reduces the time needed to take action but also allows local governments to adequately prepare evacuation routes. For example, roads designated as evacuation routes may be prioritized for improvements or receive signalization preference during emergency events. Further, evacuation route plans can be socialized with a community so that residents are aware of where they should go during a disaster event. This may also help reduce the number of 911 calls received during a disaster event, which was noted as a problem in adjacent Buchanan County. The Planning Team noted that emergency evacuation route planning is needed for areas across the county.

- **Continuity of Operations Plan:** A Continuity of Operations Plan (COOP) details how an organization will remain operational and perform essential functions following any event that makes it unsafe or impossible for employees to work in the normal location. COOPs go beyond activities detailed in an emergency action plan including:
    - Delegation of transfer of authority;
    - Identification of essential functions (information technology, payroll, communications);
    - Alternate facilities for performing work;
    - Alternate transportation and remote work capabilities;
    - Access to and safeguarding of information (physical, local server, cloud); and,
    - Return to normal operations.

Ordinances and Regulations

The County has adopted and maintains several ordinances which support the ability of County officials to reduce flood risk. The ordinances are described below.

Floodplain Management

The County has an existing Floodplain Management Plan adopted as Chapter 12 of the Tazewell County Code of Ordinances.[6] The purpose of the chapter is to prevent loss of property and life, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base while creating health and safety standards. This is accomplished through regulating uses that will cause unacceptable increases in flood heights, velocities, and frequencies, restricting or prohibiting certain uses from locating within areas subject to flooding, and requiring uses that do occur in flood-prone areas to be protected and/or hardened against flooding and flood damage and protecting an individual from buying lands and structures which are unsuited for intended purposes because of flood hazards.

Soil and Erosion Control

The County has an adopted Soil and Erosion Control Ordinance as Chapter 9 of the Tazewell County Code of Ordinances.[7] Land-disturbing permits are required and issued by the County for clearing, filling, excavating, grading, or transporting, or any combination thereof, on all lands except privately owned, occupied, or operated, agricultural, horticultural, or forestry lands.

Soil and erosion control regulations are effective when implemented, however, there is a lack of awareness among the public as to when permits are required. For example, soil and erosion control permits are often not sought for the construction and/or expansion of single-family homes even though it is a requirement. The County staff indicated challenges with effectively enforcing the soil and erosion control regulations.

Stormwater Management Plan

Tazewell County does not have a stormwater management plan. However, the soil and erosion and subdivision regulations prohibit lands from being platted for residential use if they are subject to flooding, irregular drainage conditions, and excessive drainage control and such hazards have not been corrected. A stormwater drainage plan demonstrating adequate drainage improvements is required before approval of major subdivisions.[8]

Building Codes

Tazewell County has adopted and enforces the Virginia Uniform Statewide Building Code. Building codes regulate construction standards. In many communities, permits and inspections are required for new construction. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of risk faced by a community.

---

[6] Tazewell County Code of Ordinances. Accessed March 17, 2023. https://library.municode.com/va/tazewell/codes/code_of_ordinances?nodeId=PTIICOOR_CH12FLDI

[7] Tazewell County Code of Ordinances. Accessed March 17, 2023. https://library.municode.com/va/tazewell/codes/code_of_ordinances?nodeId=PTIICOOR_CH9ERSECO

[8] Tazewell County 2017 Comprehensive Plan. Retrieved February 24, 2023. 2017-Comprehensive-Plan-Final.pdf (tazewellcountyva.org)

Zoning and Subdivision Ordinances

Zoning codes and subdivision ordinances are tools used by communities to regulate land uses and building types within certain geographic areas. When used correctly, zoning and subdivision ordinances can be used to manage development in a logical, harmonious way that keeps residents safe. For instance, zoning can direct sensitive land uses out of hazard areas. Tazewell County does not currently have zoning or subdivision ordinances in place.

Limitations

While the county has implemented numerous plans and policies to help mitigate flood risk, certain planning and policy limitations were identified by the Planning Team in addition to the ones described in the above sections. These limitations are described below.

- **Floodplain management**: Homes built within the floodplain that go through the permitting process have experienced limited damage during flood events relative to pre-1997 construction, which was not subject to flood damage prevention requirements. However, enforcement to keep sheds, trucks, and other encroachments out of the floodplain is challenging. Additionally, private bridges (e.g., driveways) are common throughout the county and are not typically constructed to floodplain management standards. During flood events, bridges have the potential to constrict floodways, and washed-away bridges may contribute to jammed waterways.

- **Logging**: A lack of controls on logging may contribute to flood problems within the county due to runoff generated by logging practices. Logging is enforced by the Virginia Department of Forestry (DOF). It is unknown if the County has the authority to regulate runoff from logging. Further, the County currently lacks the staffing capacity to enforce logging runoff controls. It was noted that while DOF is responsive to soil and water notification of problems from the County, the agency does not have current initiatives to proactively enforce logging controls within the county.

- **Stormwater**: The Virginia Department of Environmental Quality (DEQ) possesses the authority to regulate stormwater. Currently, little is done with the sheet flow from roadways. Implementation and enforcement of stormwater controls would likely reduce flood risk within the county, especially for roadways and access.

- **Stream buffers**: Constraints regarding available land for development and infrastructure placement (due to topography) limit the implementation of stream buffers within the county. Vegetation along streams is often within residential yards and not subject to any stream buffer requirements. One potential avenue for implementing stream buffers is Virginia's Agricultural Cost-Share program[9]. The Agriculture Cost-Share Program established in 1984 helps farmers implement conservation practices that prevent pollution from reaching waterways. "Best management practices" funded by the program include livestock fencing near streams, planting buffers of trees and native plants along waterways, and nutrient management plans to ensure

---

[9] Agricultural BMP Cost-Share Program. Virginia Department of Conservation and Recreation. Accessed March 24, 2023. https://www.dcr.virginia.gov/soil-and-water/costshar2

farmers utilize the correct amount of fertilizer among other stream and waterway preservation methods.[10]

Staffing and Training

The ability of a local government to develop and implement flood risk reduction projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. As summarized below, County staff currently has limited capacity to implement flood risk reduction. There is a need for staff to implement flood risk reduction measures and for an official to conduct reviews and enforcement of the building code and flood damage prevention ordinance.

Limitations

The Planning Team noted that most County officials serve multiple roles within the county, which impacts staff members' capacity to pursue new initiatives, such as funding opportunities or partnerships. County officials also recognize the need to have a Certified Floodplain Manager (CFM) on staff who would be able to pursue flood-risk reduction measures. County officials indicated a preference for contract work for this position over hiring more full-time staff.

In addition to the limitations described above, Tazewell County experienced significant flood events in 2020, 2021, and 2022. Because of these events, County staff has focused efforts on emergency response and recovery rather than preemptive flood risk reduction. However, the recovery process presents opportunities for reducing flood risk during rebuilding.

Additional Initiatives and Considerations

Environmental Permitting

The Clinch River boasts more endangered mussel species than any other river in North America as it flows through the far southwestern corner of the Commonwealth in Tazewell, Russell, and Scott counties before crossing into the state of Tennessee. A record 55 species of mussels once inhabited the watershed. However, pollution events, poor land use practices, loss of anadromous fish hosts, and fragmented habitat caused by dams have reduced that number to 46 species, according to recent accounts.[11] Within Tazewell County, there are six endangered species of mussels according to the U.S. Fish and Wildlife Services.

Limited capacity and staff expertise present a regional problem with complying with federal environmental permitting and regulations, such as the Endangered Species Act, specifically concerning stream maintenance. The presence of the mussels adds requirements for the protection of the mussels and additional complexities or directly prevents removing debris and collected sediment from clogged streams that were previously allowed – both of which are significant contributors to floods. The inability to remove debris and sediment from impacted streams was expressed as the largest barrier to reducing

---

[10] Virginia's Agricultural Cost-Share Program. Chesapeake Bay Foundation. Accessed March 24, 2023. https://www.cbf.org/about-cbf/locations/virginia/issues/virginias-agricultural-cost-share-program.html

[11] We're Ready for Musselrama 2021! Virginia Department of Wildlife Resources. Retrieved March 23, 2023. https://dwr.virginia.gov/blog/were-ready-for-musselrama-2021/

flood risk, as removing debris promotes unobstructed stream flows and allows streams to store and channel greater volumes of water within their banks.

Table 5-2 below summarizes the location and status of the local endangered mussel species within Tazewell County. According to the Fish and Wildlife Service, the Cumberlandian combshell mussels, oyster mussels, purple bean, and rough rabbitsfoot mussels persist at extremely low levels in portions of the Cumberland and Tennessee River basins in Kentucky, Tennessee, and Virginia. Currently, the species and their habitats are impacted by deteriorating water quality, primarily from impactful and poor land-use practices. The species are vulnerable to toxic chemical spills.[12] The slabside pearlymussel and fluted kidneyshell are endemic to portions of the Cumberland and Tennessee River systems of Alabama, Kentucky, Mississippi, Tennessee, and Virginia. The fluted kidneyshell mussel is restricted to the Cumberland Region.[13]

Table 5-2: Critical Habitat – Mussels within Tazewell County.[14]

Mussel Common Name	Scientific Name	River	Status
Cumberlandian Combshell	Epioblasma brevidens	Clinch	Endangered
Oyster Mussel Freshwater Mussel	Epioblasma capsaeformis	Clinch	Endangered
Slabside Pearlymussel	Pleuronaia dolabelloides	Clinch	Endangered
Fluted Kidneyshell	Ptychobranchus subtentum	Clinch and Little River	Endangered
Rough Rabbitsfoot	Quadrula cylindrica strigillata	Clinch	Endangered
Purple Bean	Villosa perpururea	Clinch	Endangered

The endangered species of mussels are shown in Figures 5-1 to 5-6

[12] ETWP; Determination of Endangered Status for the Cumberland Elktoe, Oyster Mussel, Cumberlandian Combshell, Purple Bean, and Rough Rabbitsfoot. USFW. Retrieved April 11, 2023. ETWP; Determination of Endangered Status for the Cumberland Elktoe, Oyster Mussel, Cumberlandian Combshell, Purple Bean, and Rough Rabbitsfoot | FWS.gov

[13] U.S. Fish & Wildlife Service. Retrieved April 11, 2023. 2013-233556.

[14] U.S. Fish & Wildlife Service. Retrieved April 11, 2023. Listed Species.

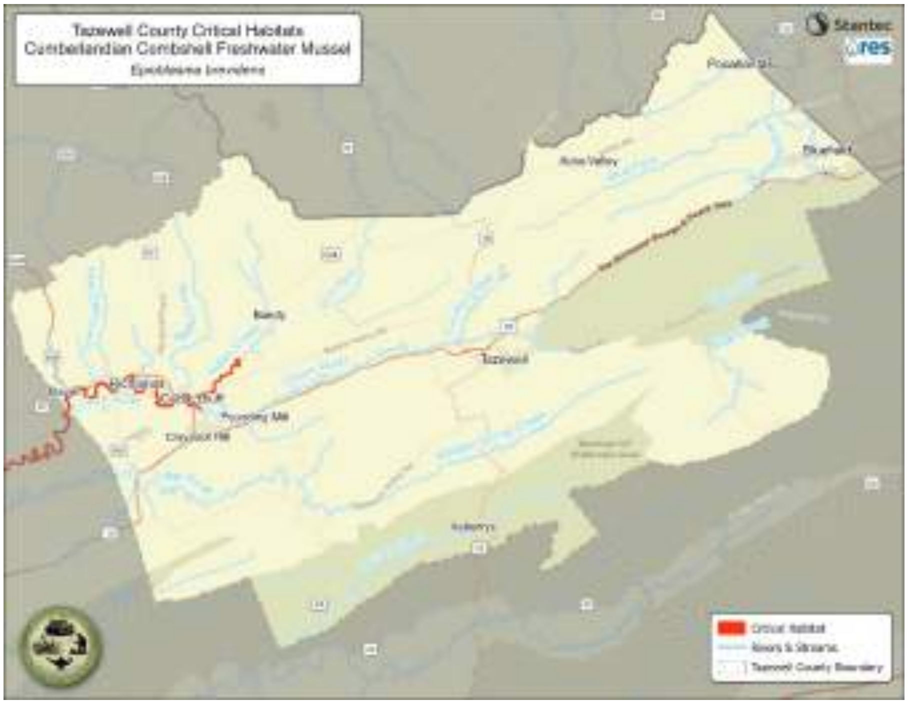


Figure 5-1 USFW Tazewell County Critical Habitat – Cumberlandian Combshell Freshwater Mussels

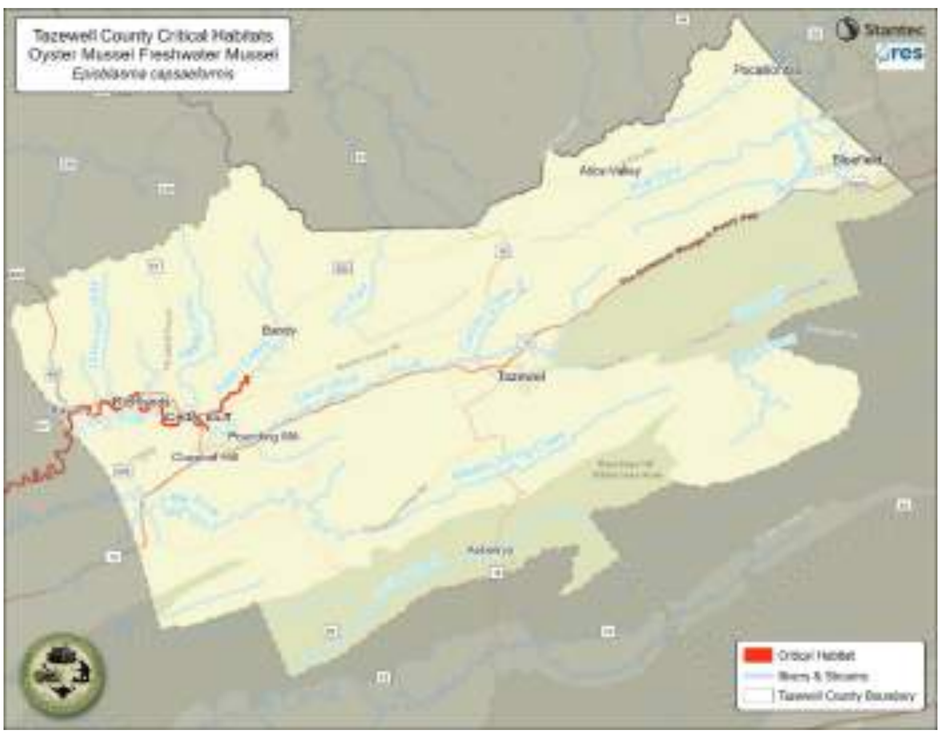


Figure 52 Tazewell County Critical Habitats - Oyster Mussel Freshwater Mussel

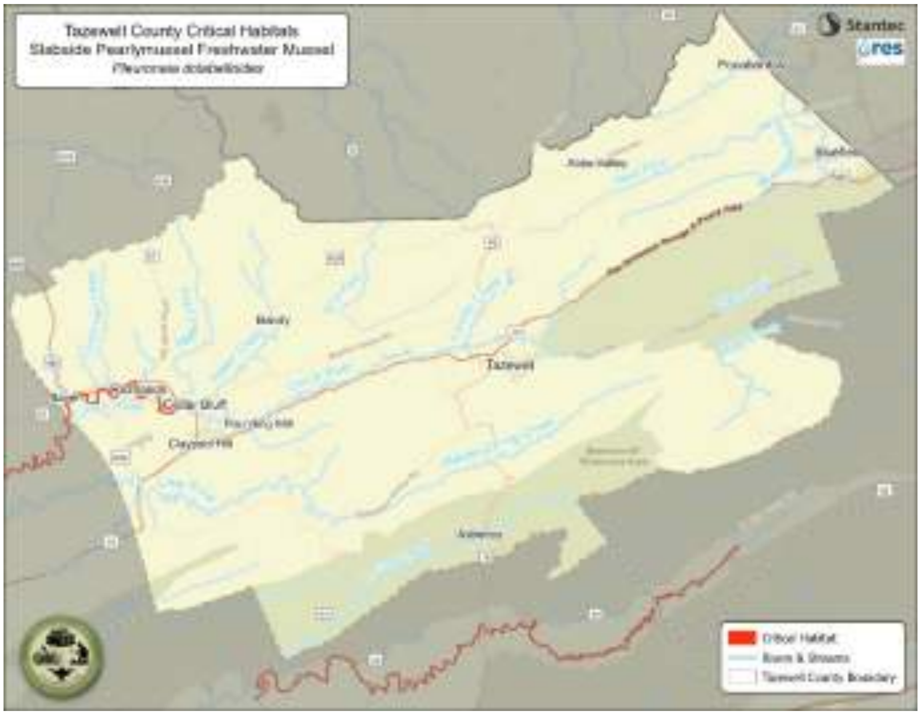


Figure 53 Tazewell County Critical Habitat - Slabside Pearlymussel Freshwater Mussel

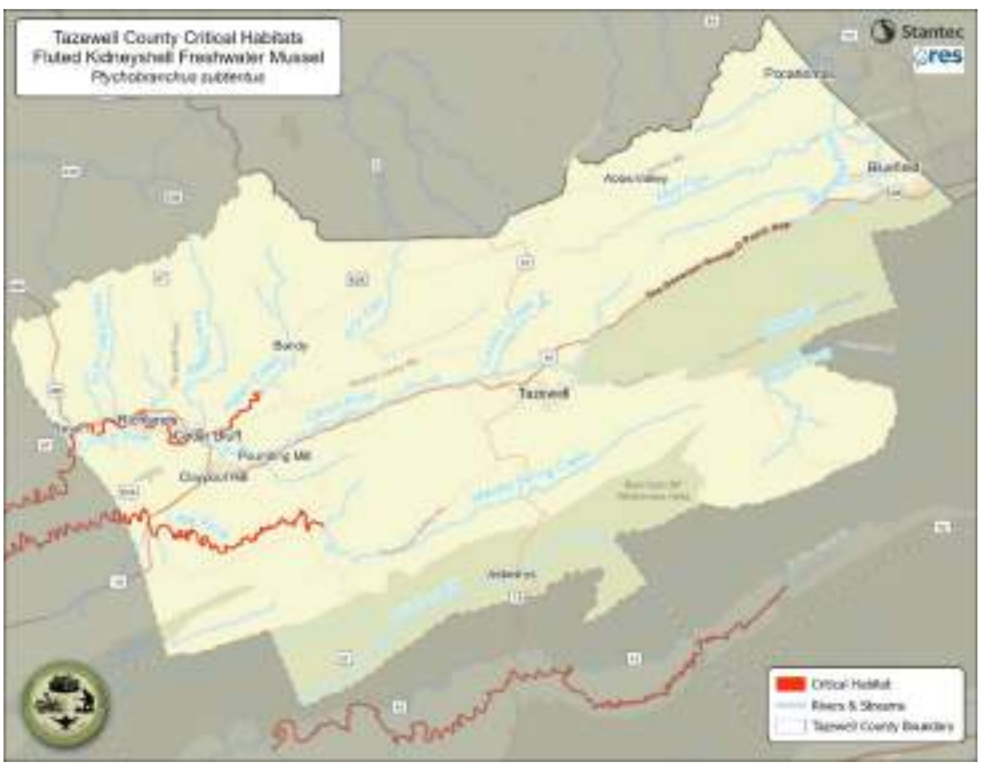


Figure 54 Tazewell County Critical Habitats - Fluted Kidneyshell Freshwater Mussel

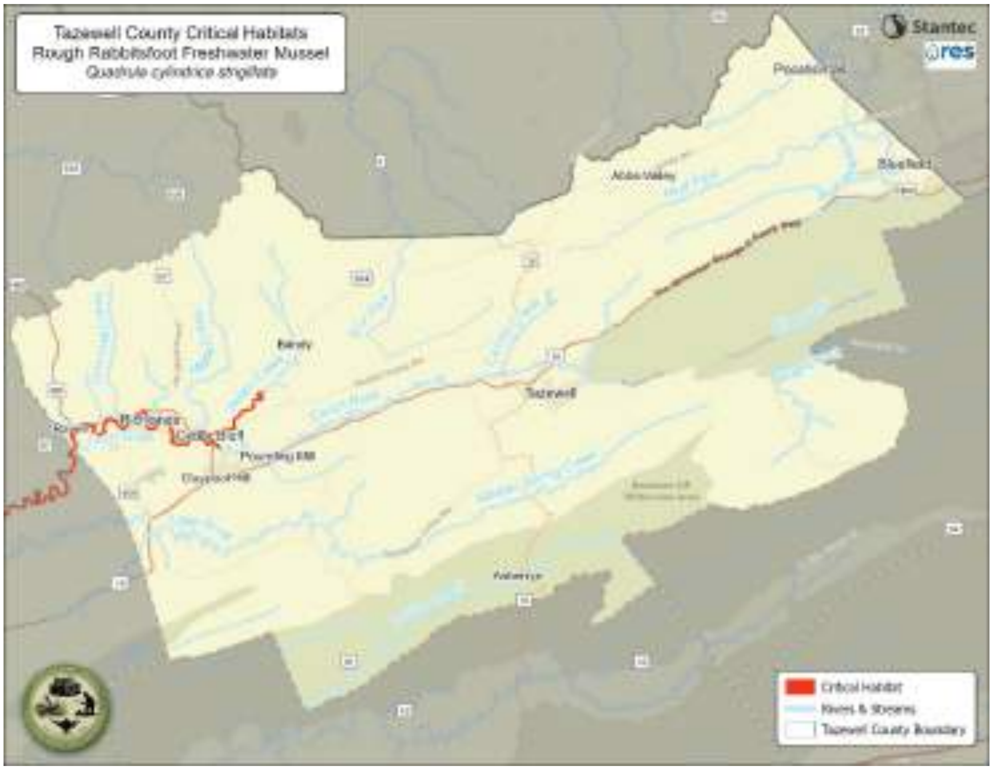


Figure 5-5 Tazewell County Critical Habitat – Rough Rabbitsfoot Freshwater Mussel

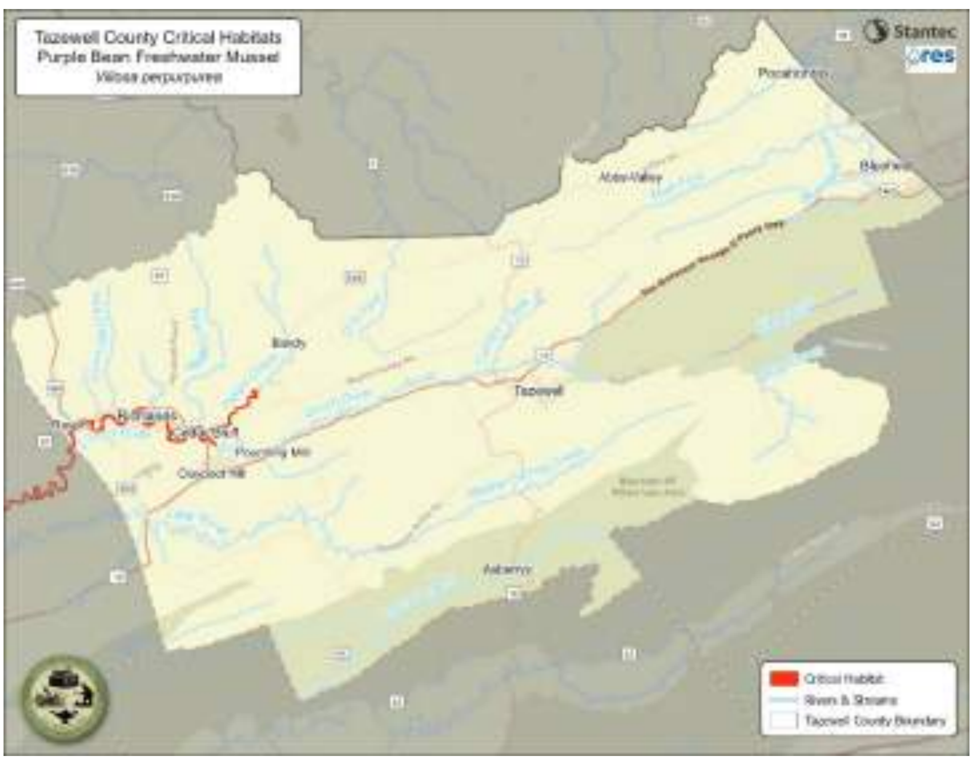


Figure 56 Tazewell County Critical Habitat – Purple Bean Freshwater Mussel

National Flood Insurance Program (NFIP)

Tazewell County has a total of 6 communities participating in the NFIP. As of March 30, 2023, the county has a total of 197 policies in place, with over $36.5 million of insurance in force. The Town of Bluefield was the first community to join the regular NFIP, joining in 1978. The other 4 communities, along with the unincorporated areas of Tazewell County, joined in 1983. The communities within the county have reported 451 paid losses, totaling $5.06 million. [15] Table 5-3 below provides a breakdown of the NFIP in Tazewell County.

Table 5-3: NFIP in Tazewell County

NFIP Data for Tazewell County					
Community Name	Year of Entry	Policies in Force	Insurance in Force	Number of Paid Losses	Total Losses Paid
Town of Bluefield	1978	40	$6,596,000	113	$781,740
Town of Cedar Bluff	1983	19	$2,494,000	13	$61,027
Town of Pocahontas	1983	8	$1,229,000	5	$247,048
Town of Richlands	1983	46	$8,074,200	147	$1,346,278
Tazewell County (Unincorporated Areas)	1983	73	$15,844,000	139	$1,994,987
Town of Tazewell	1983	11	$2,313,000	34	$630,561
	Totals:	**197**	**$36,550,200**	**451**	**$5,061,642**

The County does not currently participate in the Community Rating System (CRS) program, which is an incentive-based program that encourages counties and municipalities to undertake defined flood risk reduction activities that go beyond the minimum requirements of the NFIP. All CRS flood mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for improved CRS class ratings, which are tied to flood insurance premium reductions.

Emergency Communications

Tazewell County maintains a Reverse 911 emergency communications system. The system allows the County to send messages to residents during emergencies. The County has noted that the system is nearing replacement. The County would like to improve their capabilities with a more advanced system to allow for targeted communications and integration with sensors.

FEMA Hazard Mitigation Grant Program in Town of Bluefield

As a result of severe flood events in 2001 and as part of FEMA's Hazard Mitigation Grant program, the Town of Bluefield was awarded funds to buyout several houses along Walnut Street adjacent to Clinch River that had suffered frequent recurrent flooding and relocate the families. A local church is currently in the process of retrofitting the empty lots into recreation fields to serve the community.

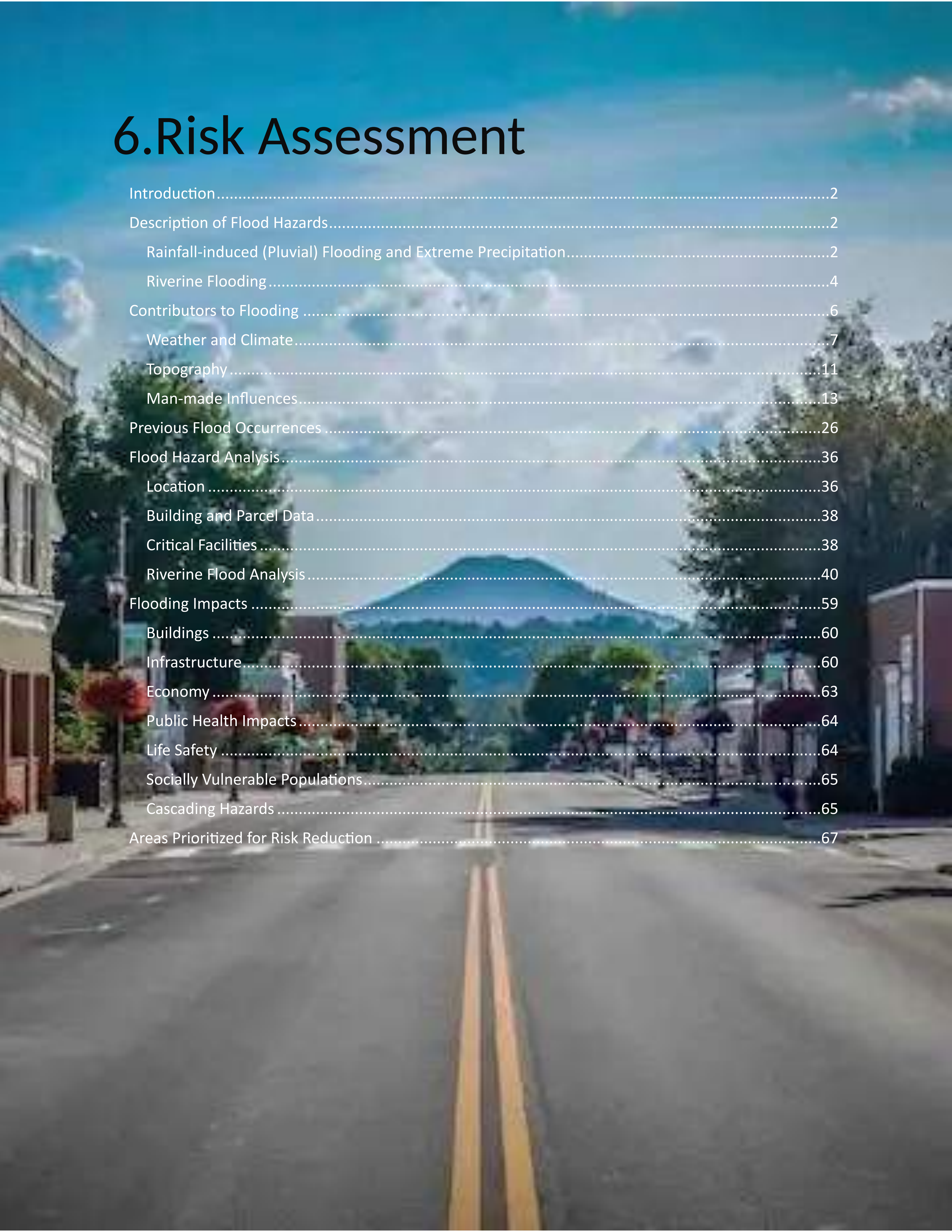
[15] FEMA Community Information System (CIS). Retrieved March 30, 2023.

US Army Corps of Engineers (USACE)

The northern portion of Tazewell County is included in the Huntington District while the southern end of the County is located within the Nashville District. Currently, the Nashville District USACE is preparing a Flood Plain Management Services technical services and planning study for the Richlands area of Tazewell County. The study will include the creation and updating of hydraulic modeling (Hydrologic Engineering Center's River Analysis System (HEC-RAS) hydraulic model) for the Clinch River to be used in the preliminary analysis of flood risk management measures for the Richlands area. Project deliverables will include a detailed report, presentation, models, data, and results. In addition, a FEMA Flood Insurance Study Update will include a submission to FEMA with updated modeling and results for FEMA FIRM and FIS mapping for the Clinch River throughout the Richlands area.

This concurrent effort provides a great opportunity for coordination and collaboration on proposed flood mitigation measures in the Richlands area. Ongoing meetings, exchange of information, and collaboration on proposed flood mitigation measures are planned with the Nashville USACE staff working on the ongoing project described above so that recommendations within this Tazewell County Flood Resilience Plan are coordinated.

6.Risk Assessment



Introduction

A comprehensive understanding of flood risk throughout the county provides the foundation for sound decision-making in the context of flood risk reduction. Assessing risk and vulnerability is essential for identifying and prioritizing locations and projects for flood risk reduction. A risk assessment uses available data, both spatial and non-spatial, to analyze the risk posed to a community, including the people and assets within.

This section provides an assessment of flood-related hazards within Tazewell County, to include:

- A description of potential flood hazards, including natural and man-made contributors to current and future flood risk;
- A summary of previous flood occurrences and associated impacts;
- A qualitative assessment of potential flood impacts, including impacts to buildings and infrastructure, public health, life safety, and the economy;
- A quantitative analysis of structures considered at-risk to flood; and,
- Areas prioritized for risk reduction, based on the results of the assessment.

Description of Flood Hazards

Flooding is a frequent, dangerous, and costly hazard. In the US, flooding results in an average of 120 deaths and $5 billion in damages annually.[1] Nearly 90% of all presidential disaster declarations result from natural events where flooding was a major component. Floods cause infrastructure damage (e.g., transportation, communication, water, and power systems), service outages, structural damage to buildings, crop loss, decreased land values, and impeded travel.

Flooding is the most common environmental hazard, due to the widespread geographical distribution of valleys and coastal areas, and the population density in these areas. The severity of a flooding event is typically determined by a combination of several major factors including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious cover. Flooding may occur when rainfall cannot drain or be absorbed fast enough (known as pluvial, or urban, flooding) or when rivers and streams exceed the capacity of their channels and water rises out of riverbanks onto surrounding lands. These types of flooding are described in depth below.

Rainfall-induced (Pluvial) Flooding and Extreme Precipitation

Rainfall-induced flooding, also called pluvial flooding, is usually caused by heavy rain over a short period of time. As land develops, or converts from fields or woodlands to roads, parking lots, and buildings, it loses its ability to absorb rainfall, increasing runoff two to six times the natural amount. Fixed drainage channels in developed areas may be unable to contain the runoff generated by relatively short, but intense, rainfall events. Since sidewalks and roads are non-absorbent, sheets of water flow down streets and into storm sewers. This high volume of water can turn parking lots into lakes, flood basements and businesses, and cause lakes to form in roads with poor or overwhelmed drainage.

---

[1] Flood Impact (n.d.). FEMA Preparedness Community. Retrieved from [Flood | Impact (fema.gov)](#).

Rainfall-induced flooding can also occur where floodplains have been developed. Development intensifies the magnitude and frequency of floods by increasing impermeable surfaces, amplifying the speed of drainage collection, reducing the carrying capacity of the land, and occasionally, overwhelming sewer systems. Figure 61 depicts the types of rainfall-induced flooding.

In addition to development, shifts in the global climate are resulting in more frequent and more intense extreme precipitation events in certain locations, including Tazewell County, which contributes to increased flooding. Extreme precipitation events may overwhelm the design capacity of existing drainage systems and result in rainfall-induced flooding or flash flooding. Flash floods occur within a few minutes or hours of heavy amounts of rainfall and can destroy buildings, uproot trees, and scour out new drainage channels. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or by heavy rains from hurricanes, tropical storms, and their remnants. Flash flooding often occurs in mountainous areas and is also common in urban areas where much of the ground is covered by impervious surfaces. In addition to flash flooding, steep slopes that are oversaturated during extreme rainfall events may prompt slope failure, resulting in landslides, mudslides, and debris-flows.

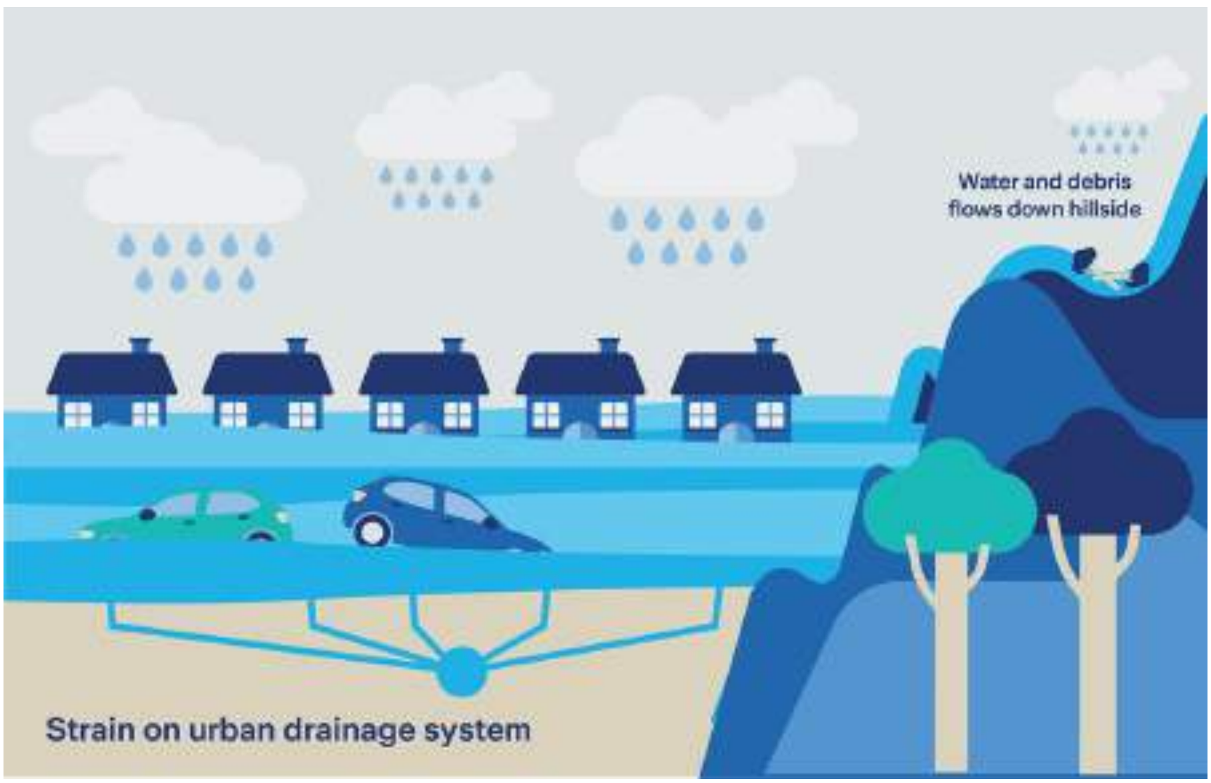


Figure 61: Rainfall-induced (Pluvial) Flooding[2]

[2] Zurich (2022). Three common types of flooding explained. Retrieved from [Three common types of flood explained | Zurich Insurance](#).

Riverine Flooding

Periodic flooding of lands adjacent to non-tidal rivers and streams (known as the floodplain) is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal waterway, some of the above-normal stream flows onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of a stream or river, as shown in Figure 62. According to USGS, the recurrence interval of a flood is defined as the probability of an event in any given year (e.g., 1% annual chance or 100-year floodplain). Higher recurrence intervals, or lower annual chances, mean larger, more wider-reaching floods.

Figure 62: Riverine Flooding[3]

Flooding is also governed by the size and the nature of the stream's watershed. A watershed is the geographic area of land where all runoff drains to a common point. Four major watersheds overlap Tazewell County: the Big Sandy, French Broad-Holston, Kanawha, and Upper Tennessee watersheds, shown in Figure 63. The major tributaries within Tazewell County that flow into each of these watersheds are outlined in Table 61.

[3] Zurich (2022). Three common types of flooding explained. Retrieved from [Three common types of flood explained | Zurich Insurance]().

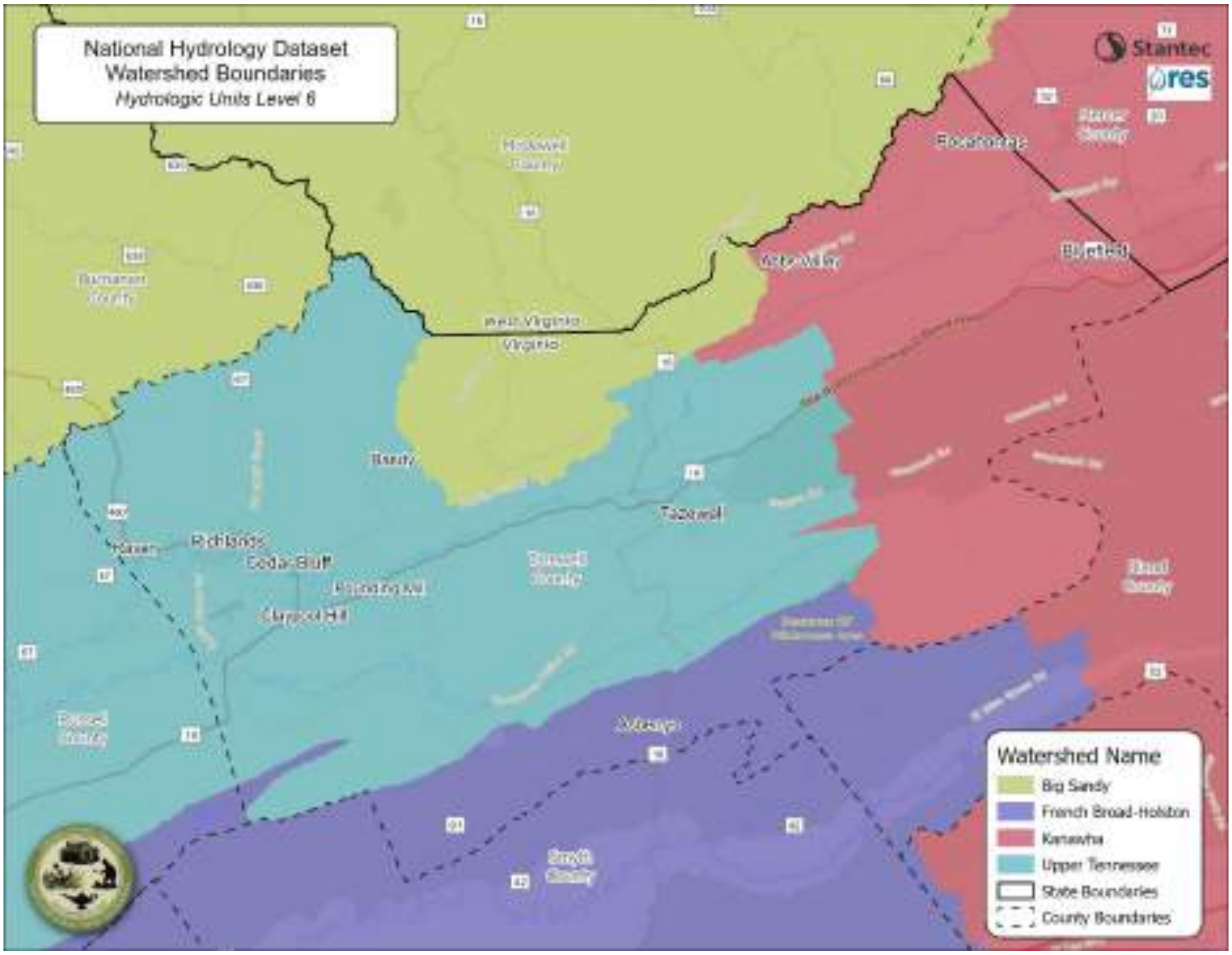


Figure 63: Tazewell County Major Watersheds

Table 61: Key Tributaries within Tazewell County

Major Watershed	Key Tributaries within Tazewell County
Big Sandy	Upper Dry Fork
French Broad - Holston	Laurel Creek
Kanawha	Bluestone River, Brush Fork, Burkes Garden Creek, Clear Fork, Laurel Fork, Mud Fork, Wolf Creek
Upper Tennessee	Cavitts Creek, Clinch River, Greasy Creek, Indian Creek, Liberty Creek, Little River, Maiden Spring Creek, Middle Creek, Pounding Mill Branch,

Floodplain Mapping

A floodplain is the land area susceptible to being inundated or flooded by water from any waterway (i.e., river, stream, lake, estuary). Floodplains are natural features of any river or stream. In many areas, FEMA has developed floodplain maps for streams that drain more than one square mile by conducting hydrologic (rainfall) and hydraulic (runoff) analysis of the watershed and stream. The mapped floodplain areas are called the regulatory floodplain, which is also known as the 100-year floodplain, 1.0% annual chance floodplain, or the Special Flood Hazard Area. The 100-year floodplain is the land area that is subject to a 1.0% or greater chance of flooding in any given year. The term "100-year flood" is often misinterpreted. The 100-year flood does not mean that a flood will occur once every 100 years. A 100-year flood has a 1/100 (1.0%) chance of occurring in any given year. A 100-year flood could occur two times in the same year or two years in a row. It is also possible not to have a 100-year flood event over the course of 100 years or more.

The floodway, located within a floodplain, includes the main channel of the stream and adjacent land that must remain clear to convey the flood event. The floodway is the high velocity area and structures or obstructions in the floodway can increase flood heights. The floodway is regulated by the Virginia Department of Conservation and Recreation (DCR) and the county's Flood Damage Prevention Ordinance. The flood fringe includes the remainder of the floodplain and provides flood water storage.

While the 100-year recurrence interval is most commonly used for floodplain management and regulatory purposes in the United States, the 500-year flood, also known as the 0.2% annual chance flood area, is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year. It is generally deeper than a 100-year flood and covers a greater amount of area; however, it is less likely to occur in a given year.

FEMA offers flood insurance through the National Flood Insurance Program (NFIP). A Special Flood Hazard Area (SFHA) shown on a Flood Insurance Rate Map (FIRM) is the regulatory floodplain. FIRMs are produced by FEMA. SFHAs are delineated on the FIRMs and may be designated as Zones A, AE, AO, AH, AR V, VE, A-99. Structures located in the SFHA are highly susceptible to flooding. Structures located in the SFHA Zones are required by lenders to purchase flood insurance. Anyone in a community that participates in the NFIP, as Tazewell County does, may voluntarily purchase flood insurance. The following SFHA zones are present within Tazewell County:

- Zone A: Zone A is the flood insurance rate zone that corresponds to the 1.0% annual chance floodplains determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone. Mandatory flood insurance purchase requirements apply for obtaining home loans.
- Zone AE: Zone AE is the flood insurance rate zone that corresponds to the 1.0% annual chance floodplains determined in the Flood Insurance Study by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply for obtaining home loans.

In addition to SFHA zones, Zone X is also present in Tazewell County. Zone X corresponds to areas outside of the 1.0% annual chance flood area, and it includes areas in the 0.2% annual chance flood boundary (500-year floodplain) and areas of minimal flood hazard.

Contributors to Flooding

Flooding can occur any time of year. The severity of flooding is determined by a combination of precipitation and weather patterns, topography and physiography, ground cover, and recent soil moisture conditions. Man-made structures and practices, such as flood control structures (i.e., dams and levees), development patterns, mining practices, and logging practices may also contribute to flooding. These natural and non-natural contributors to flooding are described throughout this section, within the context of Tazewell County.

Weather and Climate

Regional Weather Patterns

The amount of precipitation, and the frequency it occurs in a particular location is a large determinant in whether an area will experience flooding throughout the year. Precipitation quantity and frequency are governed by the weather (short-term conditions) and the climate (long-term weather trends) of that location. National and regional weather patterns are driven by large-scale forces. These include air masses, pressure systems, wind patterns, and ocean surface currents.[4] As illustrated in Figure 64, Virginia is located in an area that is greatly influenced by interactions between dry, cool air from the north with moist, warm air from the south. This area of interaction, called the polar front, produces frontal systems that are most active in Virginia from the late fall through the middle of spring. Storms resulting from these interactions are typically slow-moving and produce moderate amounts of precipitation. This can result in flooding as rain continues over the same region for an extended period.

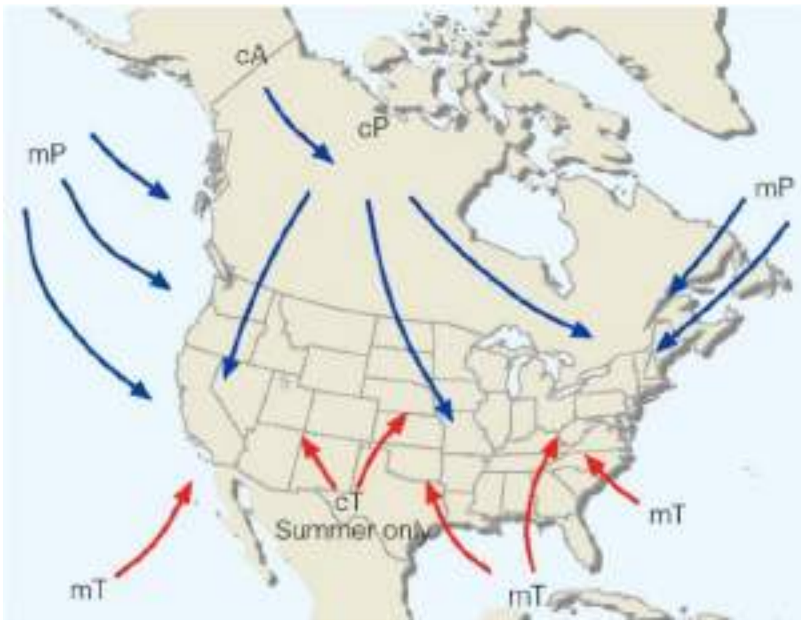


Figure 64: Air mass source regions affecting Virginia.[5]

Smaller, localized storms capable of producing more precipitation in a shorter amount of time influence the region from mid-spring through early fall but can occur at any time of the year. These storms often start as morning thunderstorms over the middle of the country and travel eastward, reaching southwest Virginia by late afternoon or evening. En route to the area, moisture is added to the storms from air flowing from the Gulf of Mexico. These storms often produce heavy rain, damaging winds, and hail.

Tazewell County is far enough inland that it is not impacted directly by hurricanes and tropical storms. However, remnants of tropical systems often pass through the area and have produced flooding in the

[4] Science Education Resource Center. (2022). Climatology Basics. Carleton College. Retrieved April 14, 2023 from https://serc.carleton.edu/eslabs/weather/3b.html

[5] Virginia Department of Conservation and Recreation. (2015). Probable Maximum Precipitation Study for Virginia. Retrieved April 8, 2023 from https://www.dcr.virginia.gov/dam-safety-and-floodplains/document/pmp-final-report.pdf

past, such as Hurricane Ivan in 2004 and Hurricane Laura in 2020. These storms occur from June to November, with August through October being the most active months.

Storm systems may not always act independently of each other. Frontal storms are commonly influenced by a tropical system. This commonly occurs when a frontal system, moving east into the area, is stalled by a tropical system moving north or northwest from the Gulf of Mexico or the Atlantic Ocean.[6] This can produce an effect called training thunderstorms, where precipitation continues to form over the same area in a relatively short period of time, producing flash floods.[7]

Future Conditions

Although a location's climate is based on decades, or even centuries, of weather and atmospheric trends, it is not static. As a result of both natural and human-induced changes, the earth's climate is always evolving. Globally, increasing average annual temperatures have increased evaporation and led to higher amounts of water vapor in the air. This has led to increased precipitation in certain areas, including Virginia. Average annual precipitation in Virginia has increased at a rate of approximately 0.33 inches per decade over the last 120 years, as shown in Figure 65.

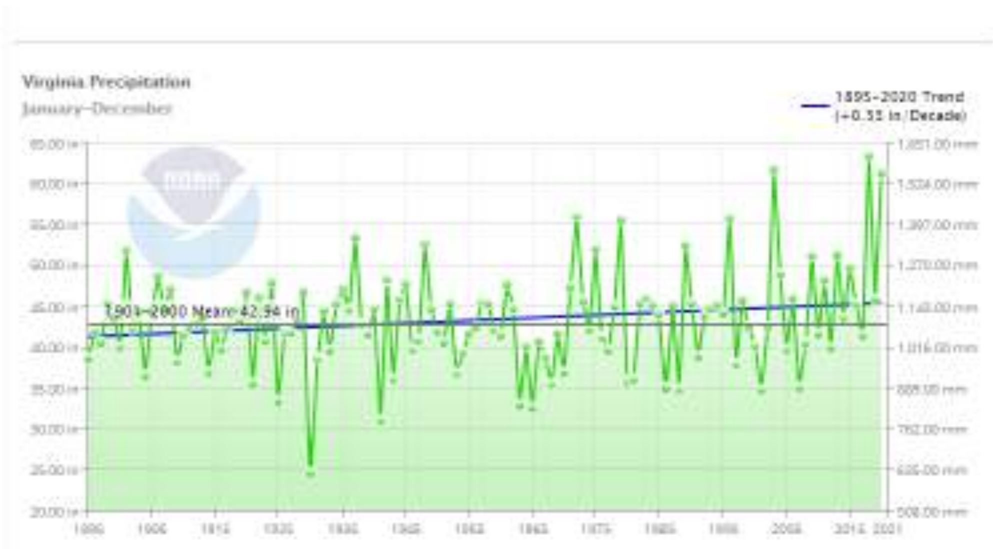


Figure 65: Virginia precipitation trend, 1895-2020.[8]

In addition to average annual rainfall, extreme precipitation events have become more frequent during the 21st century. Figure 66 illustrates observed changes in precipitation experienced over both long-term

---

[6] Virginia Department of Conservation and Recreation. (2015). Probable Maximum Precipitation Study for Virginia. Retrieved November 8, 2022 from https://www.dcr.virginia.gov/dam-safety-and-floodplains/document/pmp-final-report.pdf

[7] National Weather Service. (2009). Glossary. Retrieved November 11, 2022 from https://w1.weather.gov/glossary/index.php?letter=t

[8] Voelsong, Sarah. (2021). Yes, Virginia, we are seeing more – and more intense – rainfall. Virginia Mercury. Retrieved April 4, 2023 from https://www.virginiamercury.com/2021/08/20/yes-virginia-we-are-seeing-more-and-more-intense-rainfall/

and short-term timeframes. The southeast has experienced an 18% increase in extreme precipitation events since 1901 and a 27% increase in events since 1958.[9]

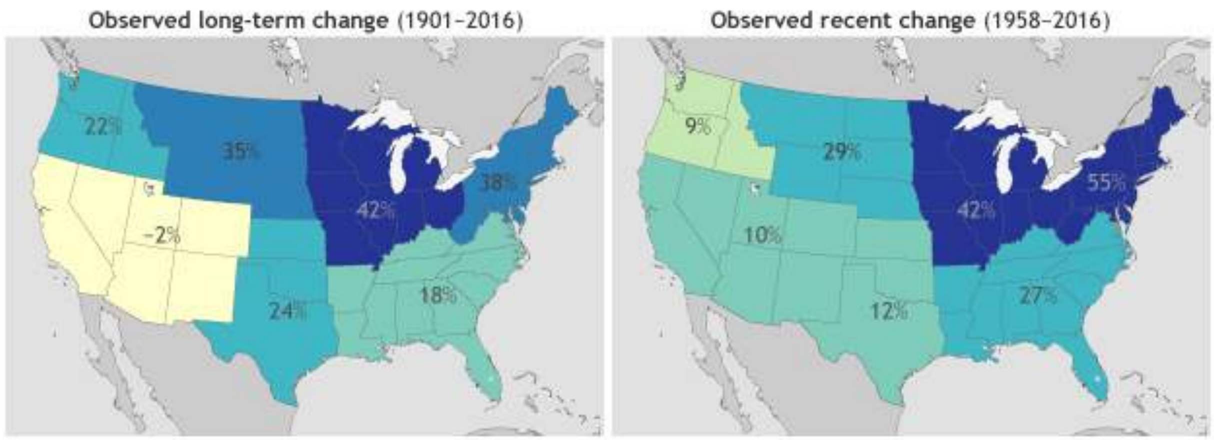
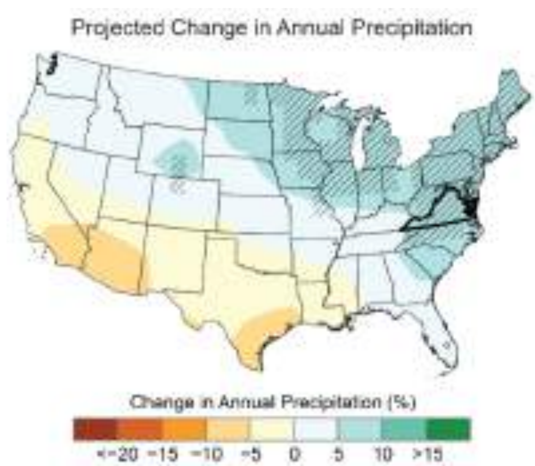


Figure 66: Change in extreme precipitation across the U.S.[10]

Observed increases in precipitation are expected to continue through the 21st century. Figure 67 shows projected changes in annual precipitation across the U.S. Virginia, assuming business-as-usual greenhouse gas emissions, is expected to see a 5% to 10% increase in precipitation by mid-century (2050) compared to the late 20th century.



[9] Scott, Michon. (2019). Prepare for more downpours: Heavy rain has increased across most of the United States, and is likely to increase further. NOAA Climate.gov. Retrieved April 5, 2023 from https://www.climate.gov/news-features/featured-images/prepare-more-downpours-heavy-rain-has-increased-across-most-united-0

[10] Easterling, D. R., Kunkel, K. E., & Arnold, J. R. (2017). Precipitation change in the United States. Retrieved April 5, 2023 from https://doi.org/10.7930/J0H993CC.

Figure 67: Projected changes in precipitation (%) for mid-century compared to the late 20th century (RCP8.5).[11],[12]

Precipitation projections, assuming business-as-usual greenhouse gas emissions, indicate that Tazewell County will receive an average of 48.3 inches of precipitation annually in the late 21st century. This is 3.1 more inches than the historic average (1976-2005). Further, Tazewell County is projected to experience 5.2 days per year with greater than 1 inch of precipitation by the late 21st century, which is an increase of 1.8 days from the historic average.[13] This is paired with a projected decrease in the overall annual number of days with measurable precipitation, indicating that Tazewell County may experience increased flooding as a result of increased heavy rainfall events.

Projections for increased precipitation and heavier rainfall events align with results of joint research conducted by USACE and the Ohio River Basin Alliance. The study area of this research was the Ohio River Basin, which encompasses all of Tazewell County. The study area basin is shown in Figure 68.

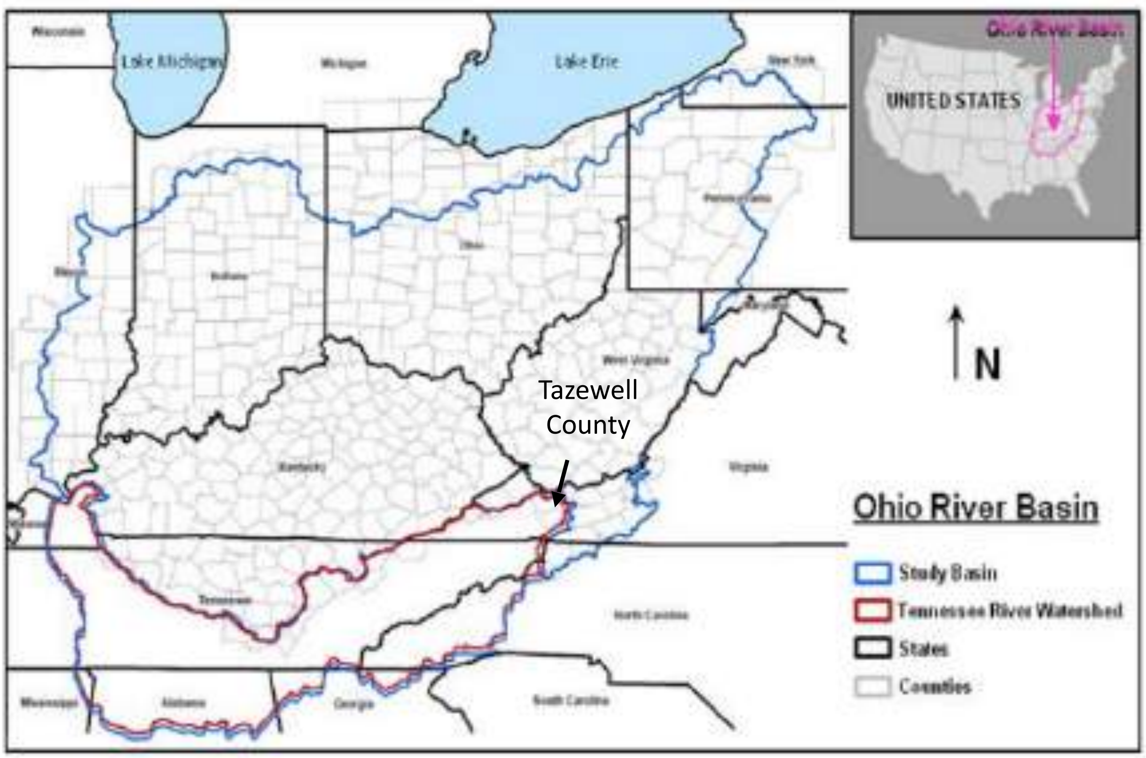


Figure 68: USACE and Ohio River Basin Alliance Pilot Study - Study Area

This study saw the development of localized climate models used to predict mean annual streamflow in the early, mid-, and late 21st century for most of the Ohio River Basin. However, a localized climate model

---

[11] Projected changes are based on “business-as-usual" (RCP8.5) greenhouse gas emissions. Hatching represents areas where the majority of climate models indicate a statistically significant change.

[12] Runkle, J. et al. (n.d.). State Climate Summaries 2022 - Virginia. NOAA Technical Report NESDIS 150-VA. NOAA/ NESDIS. Retrieved April 5, 2023, from https://statesummaries.ncics.org/chapter/va/

[13] U.S. Global Change Research Program. (2022). Climate Mapping for Resilience and Adaptation Assessment Tool. Retrieved April 18, 2023 from https://livingatlas.arcgis.com/assessment-tool/home.

was not completed for the Tennessee River sub-basin (feeds into the Ohio River, outlined in red in Figure 68), which includes the south central portion of Tazewell County. However, the authors note that the results would be very similar to projections made for the Cumberland River sub-basin (noted in Figure 69) based on their adjacency. The study found that the southeastern portion of the Ohio River Basin is expected to experience some of the highest streamflow increases within the entire Ohio River Basin. The annual mean streamflow is expected to increase by 5-25% during the early and mid-21st century timeframes. By the late 21st century, the research indicates the annual mean streamflow in areas adjacent to Tazewell County will increase by 15-35%, shown in Figure 69.

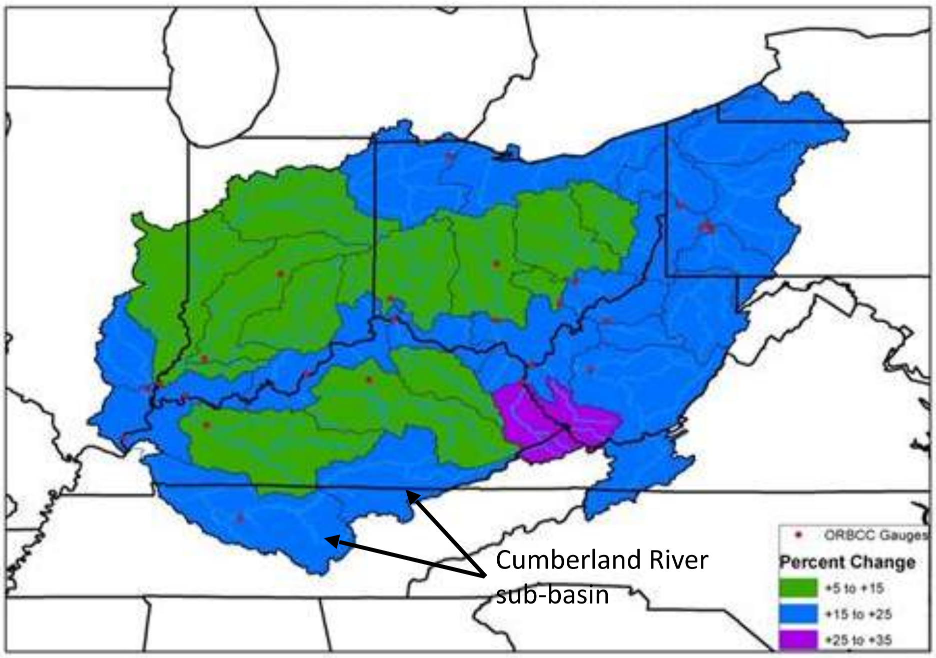


Figure 69: Forecasted annual mean percent change in streamflow (2071-2099)[14]

Topography

Weather systems are influenced by the terrain of the earth. Terrain at a higher elevation, like Tazewell County, has more influence on weather systems. Additionally, an area's terrain, or topography, influences the direction and speed of rainfall runoff as it travels over land and through stream channels. Orographic precipitation, shown below in Figure 610, is a phenomenon where warm, moisture-filled air is forced upwards by physical terrain features such as hills or mountains. As a result, the moist air cools rapidly and water vapor condenses and forms precipitation, which is released on the windward side of the mountain. This creates a scenario where the leeward side of the mountain is in a rain shadow region and receives significantly less precipitation than the windward side.

---

[14] Drum, R., Noel, J., Kovatch, J., Yeghiazarian, L., Stone, H., Stark, J., & Raff, D. (2017). Ohio River Basin–Formulating Climate Change Mitigation/Adaptation Strategies through Regional Collaboration with the ORB Alliance. Retrieved April 10, 2023 from Ohio River Basin - Formulating Climate Change Mitigation/Adaption Strategies (army.mil).

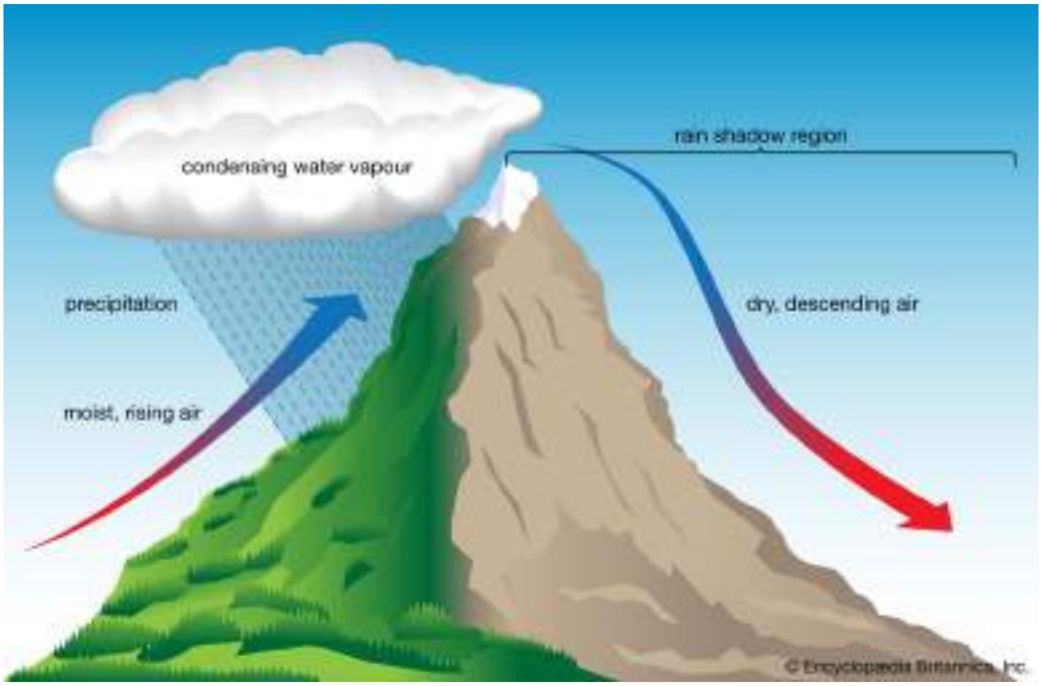


Figure 610: Orographic precipitation[15]

Regionally, rain shadows are evident just east and northeast of Tazewell County, in the New River Valley and the Shenandoah Valley, shown as the lighter green areas in Figure 611. These areas receive some of the lowest amounts of precipitation throughout the state. Within Tazewell County, the high ridges that travel through the center and along the southeastern border of the county may cause large amounts of precipitation to be rapidly released over these areas of the county. These areas are notably higher than the rest of the county and heavy precipitation in these areas could result in flooding at lower elevations elsewhere in the county.

[15] Encyclopedia Britannica. (n.d.) Orographic Lift. Retrieved April 15, 2023 from https://www.britannica.com/science/orographic-precipitation#/media/1/433062/140263

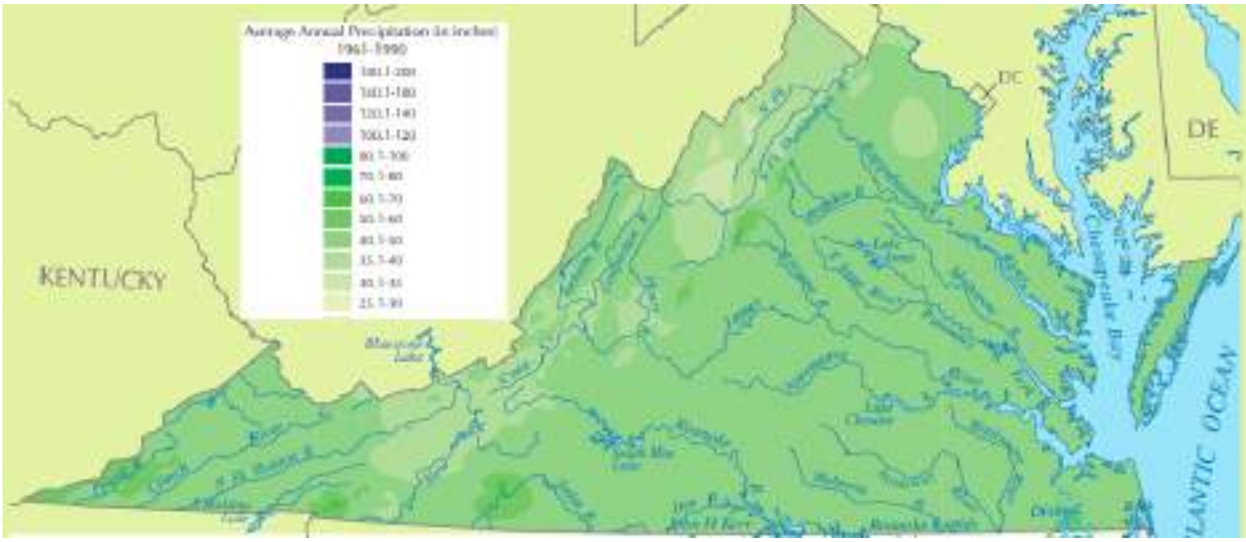


Figure 611: Average Annual Precipitation 1961-1990.[16]

Aside from producing orographic precipitation, the high mountain ridges throughout the county influence how weather systems travel through the area on a local scale. The ridges may restrict and slow air currents as they travel across the county.[17] This may produce localized heavy rainfall events as a result of a stalled storm or front.

As mentioned above, the terrain of Tazewell County also influences the direction and speed of precipitation runoff. The steep mountains and deep valleys allow runoff to travel rapidly from high ridges to the low-lying streams and rivers. Furthermore, the steep terrain results in water moving at high velocity through tributaries. The combination of high speed and large volumes of water can result in destructive flooding along almost any of the county's waterways during a heavy rainfall event.

Man-made Influences

In addition to the natural influences described above, man-made structures and practices have the potential to increase the likelihood and/or severity of flood events. Development, which increases the amount of impervious cover, such as roads and buildings, within a watershed, can exacerbate rain-fall-induced flooding. Additionally, man-made structures within waterways, such as bridges, may restrict flows. Similarly, stored property within the floodplain, and especially the floodway, such as cars, trailers, equipment, and outbuildings, may also restrict flows when they are carried into the stream during flood events. Further, in Tazewell County, flood control structures such as dams may impact flooding, and decades of mining in parts of the county have contributed to flood risk. Mining increases flood risk in a number of ways, including increased decreased vegetation, increased sediment in waterways, alterations to the topography, and increased impervious surface. These influences are described further below.

[16] Virginiaplaces.org. (n.d.) Rain Shadows – The Orographic Effect. Retrieved March 11, 2023 from http://www.virginiaplaces.org/geology/rainshadow.html

[17] Carpenter, Michael. (2018). How Do Mountains Affect Precipitation? Sciencing by Leaf Group Ltd. Retrieved March 11, 2023 from https://sciencing.com/do-mountains-affect-precipitation-8691099.html

Dams and Dam Failure

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir. Dams provide a number of vital functions to nearby communities. Often, they are a source of hydroelectric power, drinking water, flood control, and/or provide a recreational area to residents.

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. Dam failures can result from natural events such as floods, earthquakes or landslides, human-induced events such as improper maintenance, or a combination of both. In the event of a dam failure, the people, property, and infrastructure downstream could be subject to devastating damage.

Although there is no history of dam failure in Tazewell County, a dam failure occurred in neighboring Bland County in 1957, causing over $6 million dollars' worth of damage in the Town of Bland.[18]

Dam failures can result from one or more of the following:

- Prolonged periods of rainfall and flooding (the cause of most failures);
- Inadequate spillway capacity resulting in excess flow overtopping the dam;
- Internal erosion caused by embankment or foundation leakage;
- Improper maintenance (including failure to remove trees, repair internal seepage problems, maintain gates, valves, and other operational components, etc.);
- Improper design (including use of improper construction materials and practices);
- Negligent operation (including failure to remove or open gates or valves during high flow periods);
- Failure of an upstream dam on the same waterway;
- Landslides into reservoirs which cause surges that result in overtopping of the dam;
- High winds which can cause significant wave action and result in substantial erosion; and
- Earthquakes which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

The U.S. Army Corps of Engineers (USACE) National Inventory of Dams (NID) lists five dams within Tazewell County, and 11 dams within 10 miles of the county. These dams are listed in Table 64; Figure 612 provides a map of their locations.

Table 64 and Figure 612 both include the hazard potential and the condition assessment for these 16 dams. These are two rating systems tracked in the NID. USACE classifies a dam's hazard potential based on the potential of a dam to affect the safety and health of citizens and property, should the dam fail. This is separate from the condition of the dam, and only assesses the potential consequences of a dam failure. The four hazard potential ratings are outlined in Table 62.

[18] Bland Messenger. (2017) Remembering the flood of '57. Retrieved on March 8, 2023 from Bland County Historical Society (blandcountyhistsoc.org)

Table 62: USACE Hazard Potential Ratings

Hazard Potential Rating	Description of Hazard Potential
High hazard potential	Failure will probably cause loss of human life.
Significant hazard potential	Failure will result in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can affect other concerns.
Low hazard potential	Failure will result in no probable loss of human life and low economic and/or environmental losses.
Undetermined hazard potential	The hazard potential for this dam has not been evaluated. The dams hazard potential will be considered the same as a low hazard potential dam.

The hazard potential for all the dams in and adjacent to Tazewell County is listed as either high or undetermined. See Table 64 for the hazard rating of each dam.

USACE began providing a condition assessment of high-hazard potential dams in 2009. This rating is used to provide a rating of the steel and concrete components of a dam. The five condition ratings are outlined in Table 63.

Table 63: USACE Condition Assessment Ratings

Condition Assessment Rating	Rating Description
Satisfactory	No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions.
Fair	No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.
Poor	A dam safety deficiency is recognized for loading conditions which may realistically occur. This rating is also used when there are uncertainties in critical analysis parameters. Remedial action or further investigations are necessary.
Unsatisfactory	A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
Not Rated	The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

None of the dams within Tazewell County received a poor or unsatisfactory condition rating. However, according to the Associated Press the Falls Mills Dam was rated as poor as recently as 2018.[19] When looking at current data, the Falls Mills Dam received a fair condition assessment and the other four dams in Tazewell County received a satisfactory condition rating or were not rated. See Table 64 for the current condition assessment ratings of all the dams in or in close proximity to Tazewell County.

Of the 16 dams in or within 10 miles of Tazewell County, only two (Amonate Slurry Impoundment and Harmon Branch Refuse Disposal Facility) are not listed as state regulated dams. Both dams are in McDowell County, WV and associated with a mining operation. Furthermore, none of the dams within 10 miles of Tazewell County (but outside of the county) present a flooding risk to residents of Tazewell County. The two dams (Bluewell Water Supply Dam No. 1 and No. 2) in Table 64 that received a Poor rating in their condition assessment do not pose a threat to Tazewell County; these dams are located downstream of Tazewell County.

It should be noted that projected increases in future streamflows within the county could produce more strain on dams in the area, increasing the likelihood of dam failure in the future.

[19] Lieb, David; Casey, Michael; and Minkoff, Michelle. (2019). At least 1,680 dams across the US pose potential risk. Retrieved on March 10, 2023 from [AP: At least 1,680 dams across the US pose potential risk | AP News]

Table 64: Dams in and adjacent to Tazewell County.[20]

Name	River	Hazard Potential	Condition Assessment
Amonate Slurry Impoundment	Not Provided	High	Not Available
Anawalt Lake Dam	Millseat Branch	High	Satisfactory
Berwind Lake (War Creek #1)	War Creek	High	Satisfactory
Bluewell Water Supply Dam No.1	Stone Lick Branch	High	Poor
Bluewell Water Supply Dam No.2	Stone Lick Branch	High	Poor
Falls Mill Dam	Mud Fork	High	Fair
Harmon Branch Refuse Disposal Facility	Not Provided	High	Not Available
Hunting Camp Dam (Pocahontas Fuel Lake)	Hunting Camp Creek	Undetermined	Fair
Jimmy Lewis Dam (Pinnacle Rock Dam)	Bluestone River	High	Satisfactory
Kenneth Tibbs Dam	Not Provided	Undetermined	Not Rated
Laurel Bed Dam	Laurel Bed Creek	High	Fair
Mocomp Dam #1	Not Provided	Undetermined	Not Rated
New Bramwell Dam	Bluestone River	High	Poor
Sportsman Club Dam	Little Creek	Undetermined	Not Rated
Upper Clinch River Dam #8 (Lincolnshire Dam)	Lincolnshire Branch	High	Satisfactory
Upper Clinch Valley Dam #1B (Cavitt's Creek Dam)	Cavitts Creek	High	Satisfactory

[20] U.S. Army Corps of Engineers. (2020). National Inventory of Dams. Retrieved March 27, 2023 from https://nid.usace.army.mil/#/

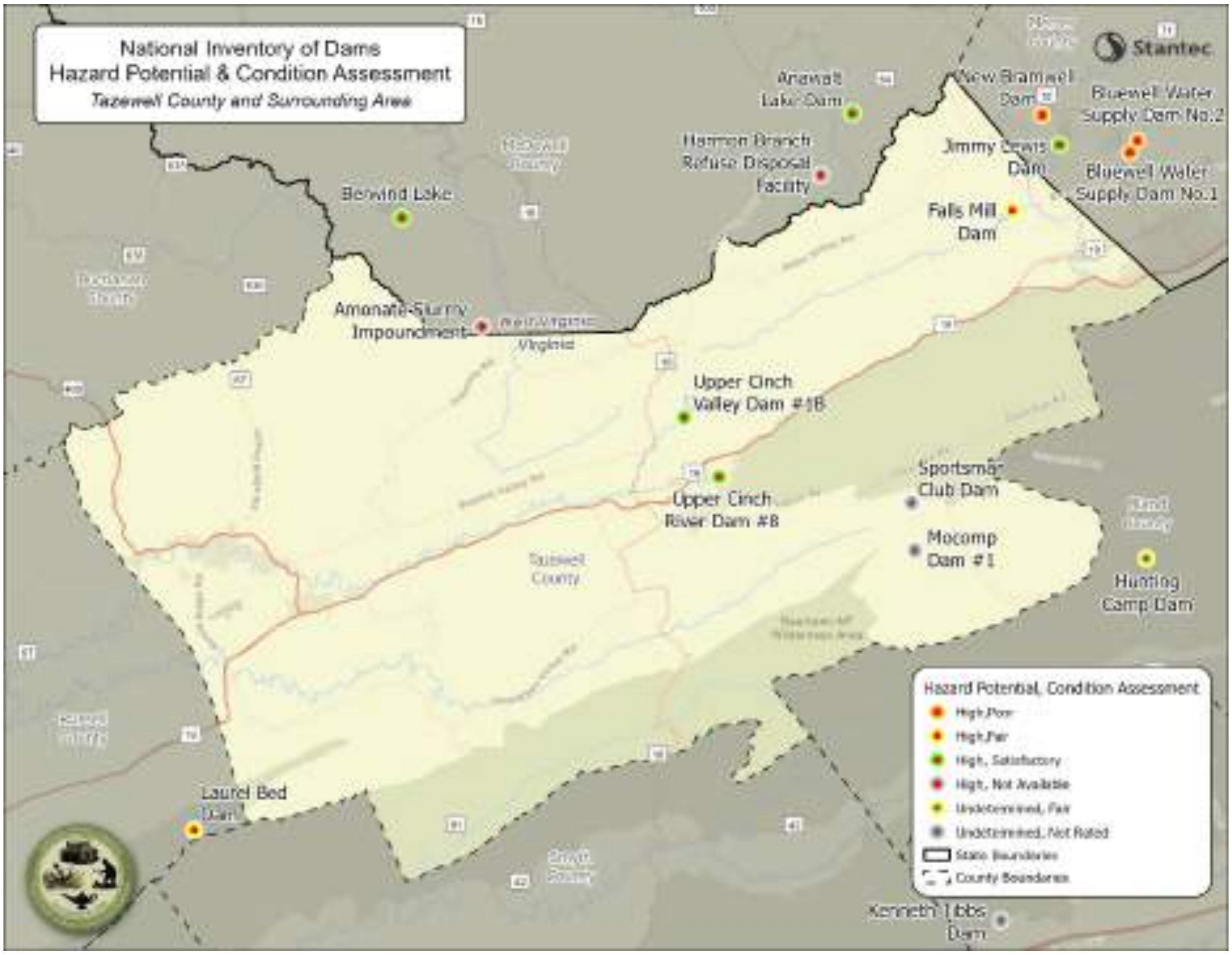


Figure 612: NID dams in and around Tazewell County.[21]

[21] U.S. Army Corps of Engineers. (2020). National Inventory of Dams. Retrieved March 27, 2023 from https://nid.usace.army.mil/#/

Dam inundation areas were produced for the Upper Clinch Valley Dam #1B (Cavitt's Creek Dam) and the Upper Clinch River Dam #8 (Lincolnshire Dam) to meet the requirements of the Virginia Soil and Water Conservation Board. The inundation mapping was completed based on the probable maximum flood for each dam, based on estimated probable maximum precipitation events. In effect, the dam inundation studies show the impact a dam failure would have on communities downstream if a dam were to fail. The exact area and inundation caused by a dam failure would depend on the location (on the dam) of the dam breach and the flooding conditions that led to the dam failure. However, the dam inundation studies provide valuable insights into which areas and properties could be affected by a dam failure.

Figure 613 shows the dam inundation area for the Upper Clinch Valley Dam #1B (Cavitt's Creek Dam). Based on the dam's Emergency Action Plan, which accounts for the elevation of each building, 320 structures are at risk to flooding in the event of a dam failure at the Upper Clinch Valley Dam #1B (Cavitt's Creek Dam).

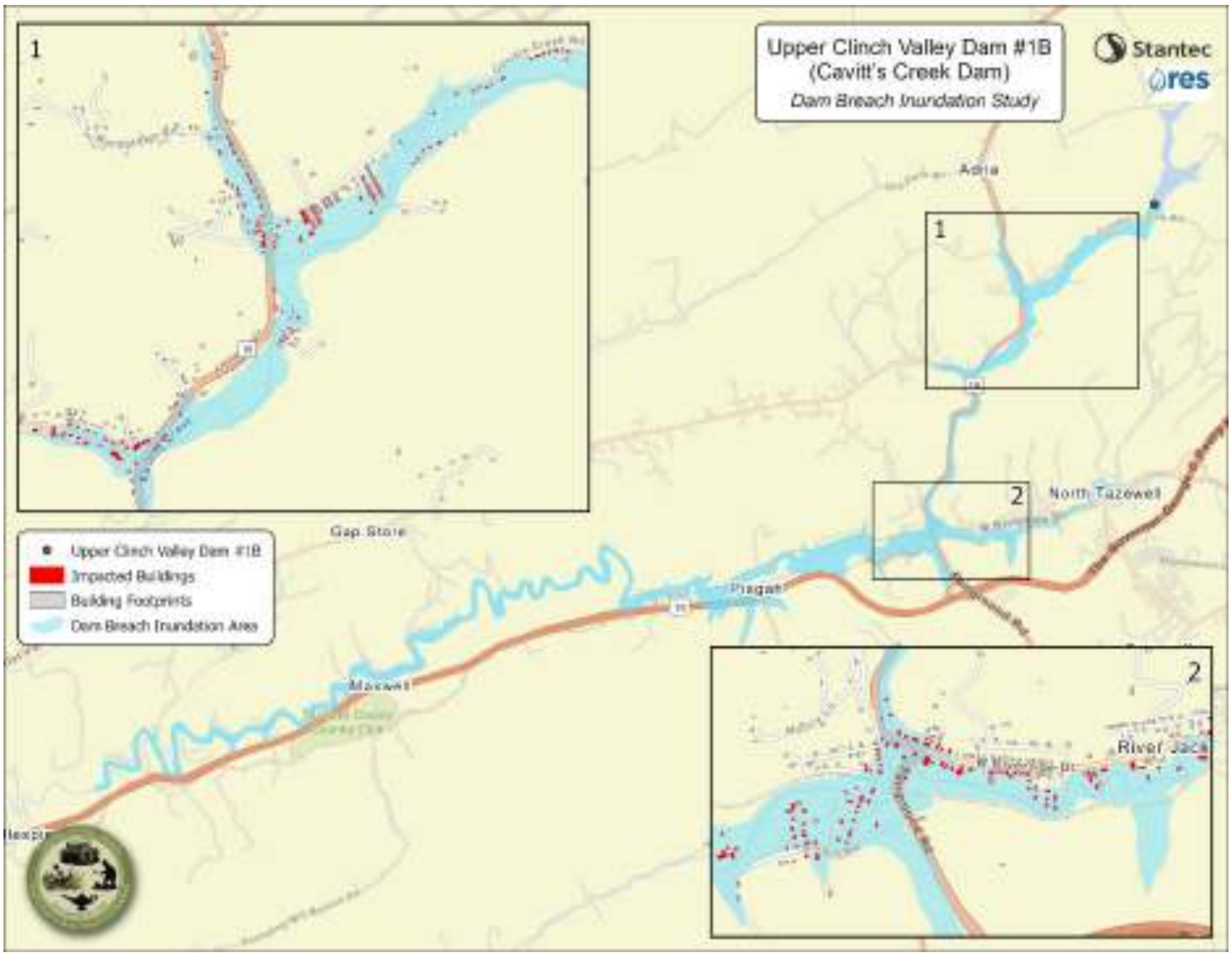


Figure 613: Dam Inundation Area for the Upper Clinch Valley Dam #1B (Cavitt's Creek Dam)

Similar to dams, levees impact the location and severity of flooding within a watershed. A levee is a man-made structure used to contain, control, or divert water to reduce flood risk. Although levees are designed to reduce flood risk, they do not eliminate the risk entirely. Levees may be overtopped or fail if a flood event exceeds the severity of its design standard (the amount of water the levee is designed to hold). However, based on information available through the National Levee Database (NLD), there are no levees present in Tazewell County. [22]

Debris and Waterway Blockages

Often during a flooding event, debris being carried by floodwaters can become stuck at a chokepoint in a waterway. Personal property located or stored within the floodplain, especially within the floodway, can contribute to this problem. Cars, tractors, outbuildings (such as sheds), mobile homes, and other items stored in flood hazard areas can be picked up during floods and jam up waterways, especially at bridges and narrow areas, to exacerbate flooding. After a flood event, this type of debris may also result in hazardous materials being released into floodwaters, potentially impacting public health and the environment. Similarly, this type of debris is more difficult to clean up and dispose of after a flood event, as it must be taken to facilities equipped to handle potentially hazardous materials.

Natural debris, such as woody vegetation and sediment from erosion, can also restrict the natural capacity of the stream (e.g., sediment building up on the streambed) and contribute to flooding. Natural debris left by a flooding in Richlands flowing a 2020 event is shown in Figure 614. When not cleared, especially after a flood event where areas pile up with debris, a hazard is created as the stream is essentially dammed and increases the likelihood that a rainfall event will become a major flood event.

Figure 614: Flood Debris from February 2020 flooding in Richlands, VA[23]

During the public meetings held in Tazewell County during the development of this plan, debris from logging was brought up several times as an issue residents believe has increased the frequency and/or severity of flooding. Logging can increase the amount of natural debris found in nearby streams and

---

[22] USACE. (2019). National Levee Database. Retrieved from National Levee Database (army.mil).

[23] Eric DiNovo. (2020). Photo included in news article published by Bluefield Daily Telegraph. Retrieved on March 8, 2023 from Richlands denied FEMA assistance for flood damages | News | bdtonline.com

rivers. Discarded logs and brush wash into waterways and logging also increases erosion in a number of ways. The large equipment disturbs the ground surface but, more importantly, the removal of tree canopies and ground cover increase the soils' exposure to direct rainfall. Stormwater flows rapidly across the surface and there are no longer root systems to hold the soil in place, increasing erosion that eventually makes its way into streams.

Forests provide many benefits to the surrounding ecosystem, especially forested land along streams and rivers. In any setting, trees and their root systems filter water and air pollution, produce oxygen, and provide habitat for many species of wildlife. Along waterways, forests can reduce flooding by stabilizing and protecting stream channels, reducing sediment load within the waterway, and by capturing and slowing the flow of precipitation during rain events.[24]

Mining Impacts and Clogged Streams
Coal has been mined commercially in Tazewell County since the 1880's and has provided jobs and income in the area for over a century. All of the coal beds in Tazewell County are located along the western edge of the county, along the shared borders with Russell County (VA), Buchanan County (VA), McDowell County (WV), and Mercer County (WV). The coal beds are shown below in Figure 615. The most economically important coal deposits are mostly located in the Pocahontas Formation, located in the northern corner of Tazewell County.

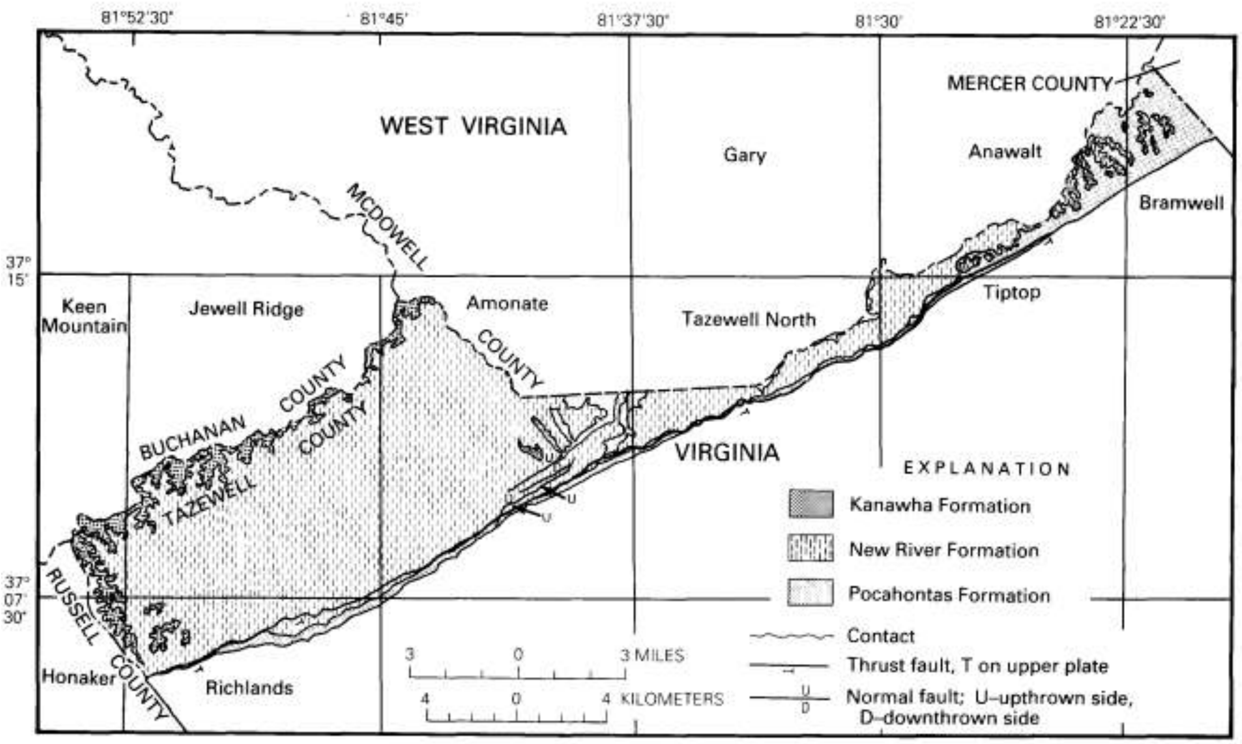


Figure 615:Map of Tazewell County Coal Fields[25]

---

[24] Virginia Department of Forestry. (2013). Riparian Forest Buffers – Forests on the Water's Edge. Retrieved April 15, 2023 from [RFB-Forests-on-the-Waters-Edge_pub.pdf (virginia.gov)].

[25] Englund, K. J., & Thomas, R. E. (1991). Coal Resources of Tazewell County, Virginia, 1980. USGS. Retrieved March 22, 2023 from [report.pdf (usgs.gov)]

The Town of Pocahontas is also home to the Pocahontas Exhibition Mine and Museum, a museum and mining exhibit, shown in Figure 616. The facility is owned and operated by the Town of Pocahontas, in partnership with Virginia Department of Energy (VA Energy). The original mine, in operation from 1882-1955, was renowned for its high-quality coal and was the chosen coal source for the U.S. Navy for decades.

Figure 616: Pocahontas Exhibition Mine & Museum

In total, over 322 million tons of coal had been extracted from Tazewell County by 1980.[26] Most of the mining in the past was from extensive underground mines. However, in the mid to late 20th century, strip (surface) mining methods were introduced, and are now the only mines operating in the county. As of 2021, Tazewell County was the third highest coal producing county in Virginia, behind Buchanan and Dickenson Counties.[27] There are four surface mines operating in Tazewell County based on the latest available data.[28] Existing coal mining operations and the Pocahontas Exhibition Mine and Museum are shown in Figure 617.

---

[26] Englund, K. J., & Thomas, R. E. (1991). Coal Resources of Tazewell County, Virginia, 1980. USGS. Retrieved March 22, 2023 from [report.pdf (usgs.gov)]

[27] US Energy Information Administration. (2021). Coal Production and Number of Mines by State, County, and Mine Type, 2021. Retrieved March 20 2023 from [table2.pdf (eia.gov)]

[28] The US Energy Information Administration releases an Annual Coal Report. The latest report was released on October 18, 2022. The next report will be released in October 2023.

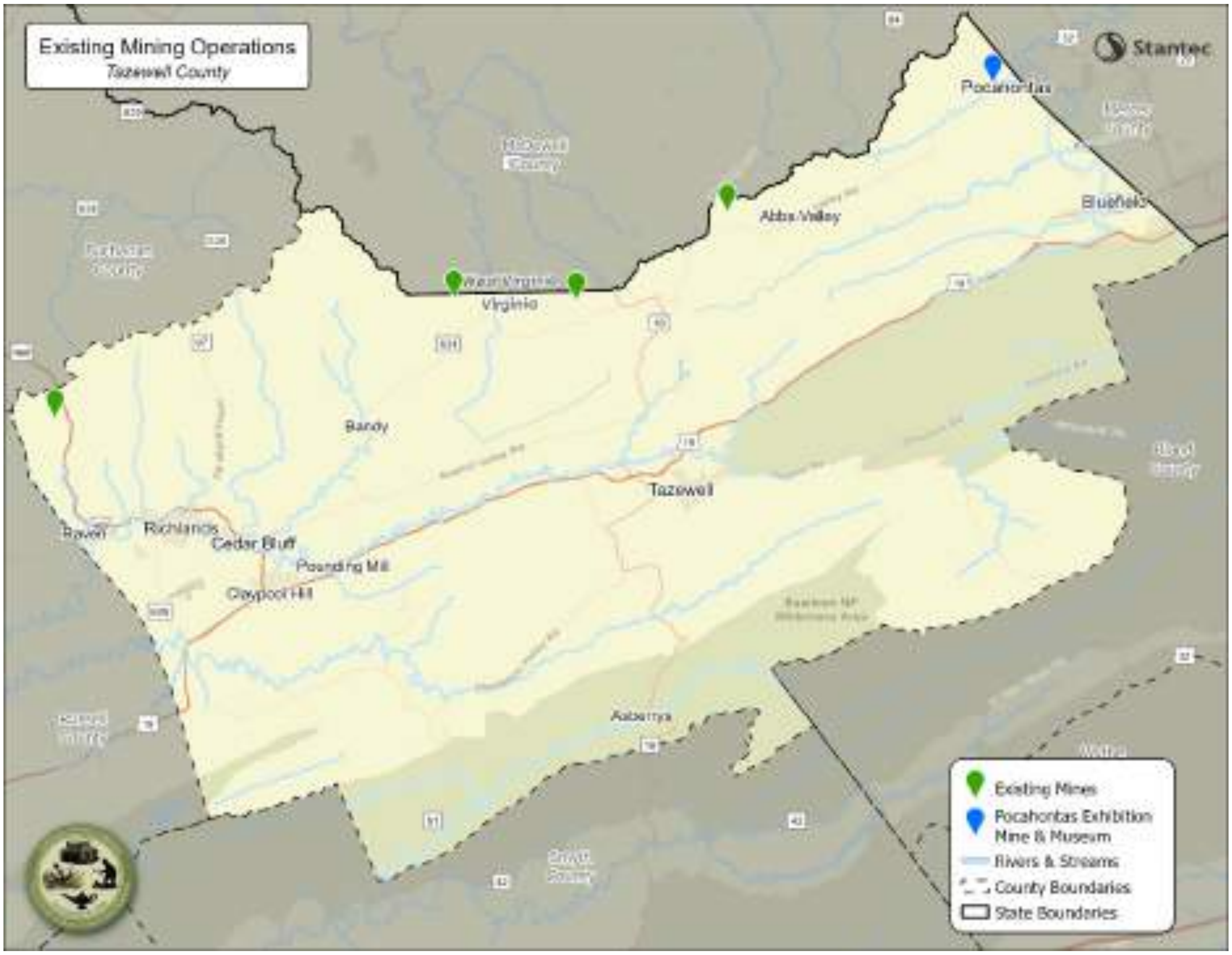


Figure 617: Existing Mining Operations in Tazewell County

The mining industry was unregulated at the federal level until 1977 and largely unregulated at a state level until 1968. Some methods and practices used in the mining industry prior to regulation resulted in unforeseen impacts on the environment and public health and safety. Some of the potential environmental impacts from mining include stream sedimentation, acid draining from tailings and waste piles, groundwater degradation, trash dumps, and landslides. Some of the potential public health and safety impacts from mining include fall hazards from highwalls, shafts and other mine openings, the unauthorized and unsupervised use of mine sites as recreational areas, and loss or degradation of drinking water. [29] In addition to environmental and public health and safety impacts, mining can also directly impact the severity of flooding in Tazewell County. The broad removal of vegetation in a mining area eliminates a natural buffer which normally slows runoff. Furthermore, the soil that has been removed eliminates more of this natural buffer. The end result is that precipitation flows into the local waterways much quicker and in higher volumes, picking up sediment and debris along the way.

The mining process produces waste material, or gob, as the coal is separated from the rest of the soil. In the past, and possibly more recently, gob piles have been dumped in the valleys, or hollows, in the

[29] Virginia Department of Energy. (2021). Abandoned Mineral Mined Lands. Retrieved March 14, 2023 from https://energy.virginia.gov/mineral-mining/AMML.shtml.

western portion of the county. These piles can create an impediment for runoff in the valleys and often leads to clogged streams. Data available from the VA Energy shows where confirmed gob piles and clogged streams are located, however it's likely there are more gob piles and clogged streams in the western portion of the county that have not been mapped. Figure 618 shows locations of mapped gob piles and clogged streams in the county.

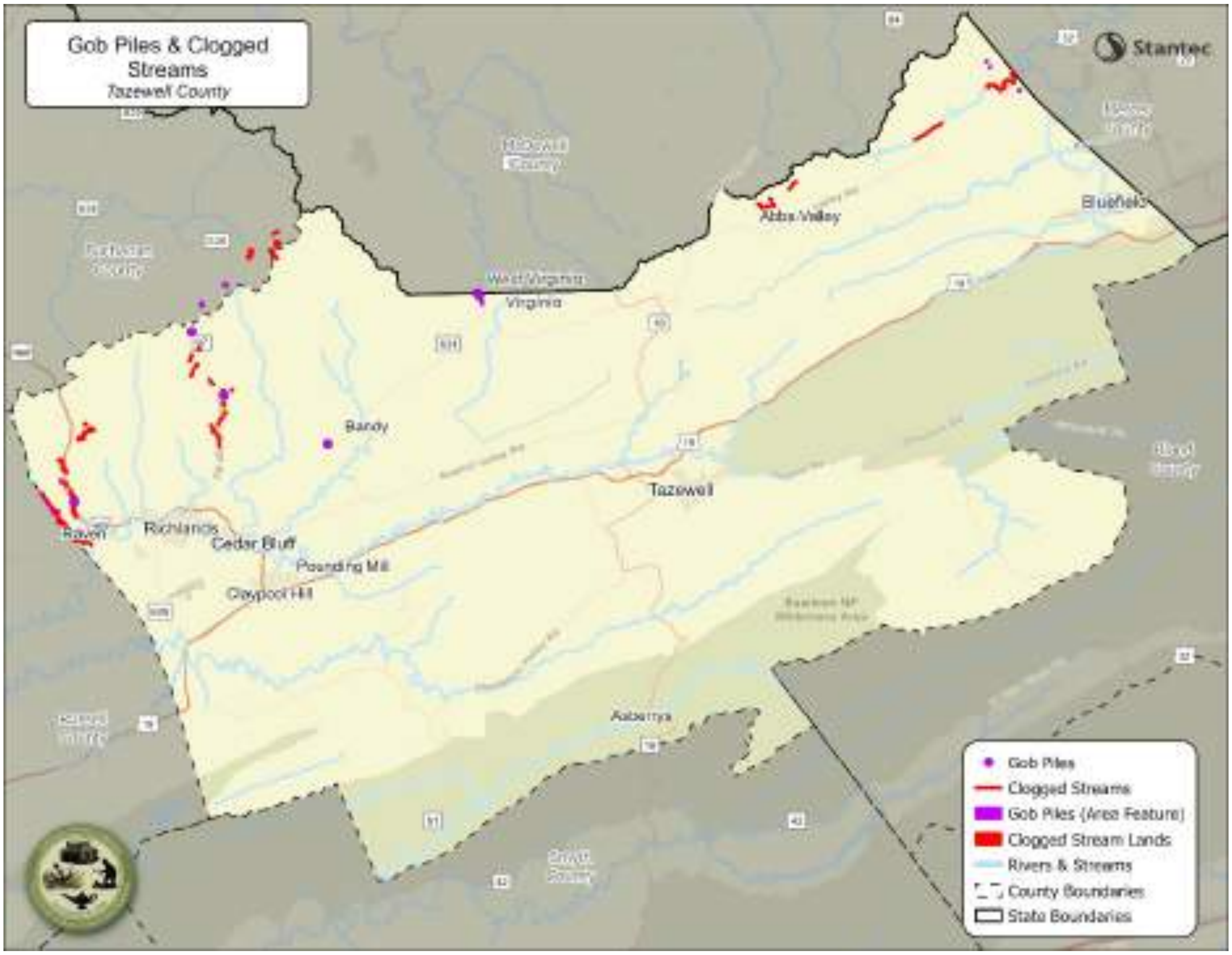


Figure 618: Tazewell County Gob Piles and Clogged Streams[30]

Abandoned mines also create a potential flooding hazard after they fill with water or have standing water. The pressure produced by this water can cause a mine blowout, sending water rushing out of the underground cavern and down the mountain. Many abandoned mines, especially those that have been mapped, have mechanisms in place to allow water to drain as the mine fills with water; however, these mechanisms may become clogged with sediment and debris when not maintained properly, contributing to the likelihood of a blowout.

Figure 619 provides a map of various mine openings (any opening or entrance from the surface into an abandoned, underground mine) identified by VA Energy. These openings allow precipitation and runoff to enter underground mines, potentially leading to a mine blowout. It is likely that there are more mine

[30] Virginia Department of Energy (VA Energy). (n.d.) Abandoned Mine Land. Retrieved on April 2, 2023 from [Abandoned Mine Land (virginia.gov)]

openings and portals in the western portion of the county that have not been mapped. It is worth noting that mine blowouts have not been brought up as a significant issue during meetings with the Planning Team or the public, but that does not mean they do not occur or are not possible in the county.

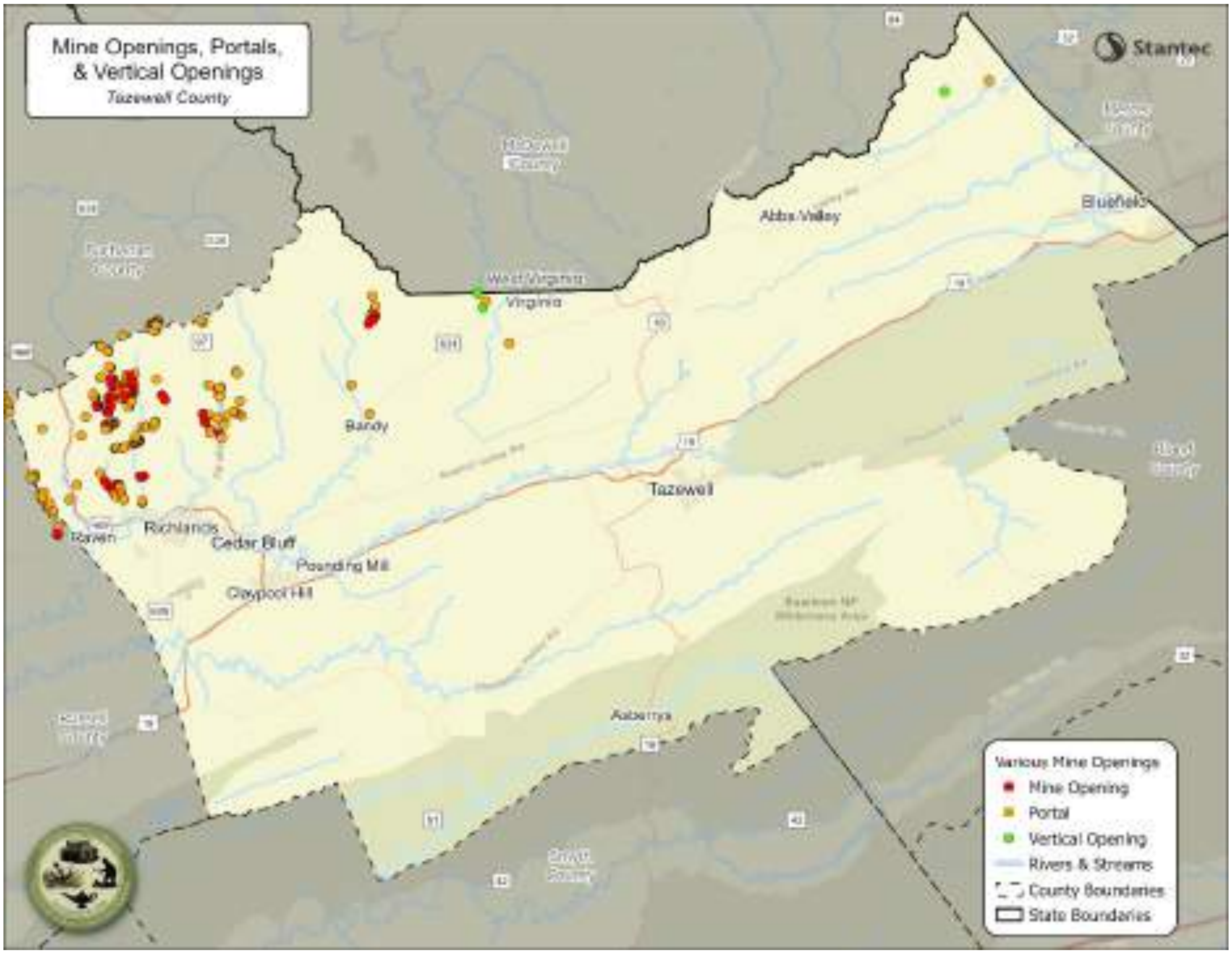


Figure 619: Mine Openings In and Adjacent to Tazewell County[31]

More recent legislation at the state and federal level has been passed in an effort to reduce these impacts through reclamation and revitalization practices. Reclamation laws enacted by the Virginia General Assembly in the 1960s and 1970s were put in place to minimize the impacts of past mining practices on the environment and public health and safety. In the 1970s, the Abandoned Mine Land (AML) Program was established to reclaim sites that were mined prior to December 15, 1981.[32] VA Energy also has the Mined Land Repurposing program which applies annually for federal money to reclaim high priority AML sites. The federal program is the Abandoned Mine Land Economic Revitalization Program and has provided Virginia $10 million every year since 2017 to develop and repurpose abandoned mines.

[31] Virginia Department of Energy (VA Energy). (n.d.) Abandoned Mine Land. Retrieved on April 2, 2023 from [Abandoned Mine Land (virginia.gov)](https://energy.virginia.gov)

[32] Virginia Department of Energy. (2021). Abandoned Mine Land. Retrieved March 14, 2023 from https://energy.virginia.gov/coal/mined-land-repurposing/abandoned-mine-land.shtml.

The federal government also recently approved further legislation to help fund AML revitalization projects. The Infrastructure Investment and Jobs Act, passed in 2022, appropriated $11.293 billion for deposit into the Abandoned Mine Reclamation Fund and included provisions to extend the AML fee collections and mandatory AML Grant distributions.[33]

Previous Flood Occurrences

Tazewell County's history includes many damaging floods. Several data sources were used to identify and assess past flood events in the county, such as the CPPDC Hazard Mitigation Plan, the National Centers for Environmental Information's (NCEI) Storm Events Database, and Disaster Declarations. Based on these sources, 42 damaging flood events were reported in Tazewell County in the last 161 years. These events are presented in Table 4-3 within *Section 4: Existing Conditions* of this plan. It is likely that flood events that occurred longer than several decades ago, before many reporting mechanisms began, are not well documented.

In addition to reported flood events, United States Geological Survey (USGS) stream gauges provide a historic record of peak streamflows on most waterways in the U.S. There are two USGS stream gauges located in or near Tazewell County, shown below in Figure 620. Streamflow of the Bluestone River has been recorded at Falls Mills, VA since 1981. Streamflow of the Clinch River has been recorded at the Town of Cleveland, VA (just downstream of Tazewell County, in Russell County) since 1921.

[33] Office of Surface Mining Reclamation and Enforcement. (2022). Guidance on the Bipartisan Infrastructure Law Abandoned Mine Land Grant Implementation. Retrieved March 15, 2023 from https://www.osmre.gov/sites/default/files/inline-files/BIL_AML_Guidance_7-19-22.pdf

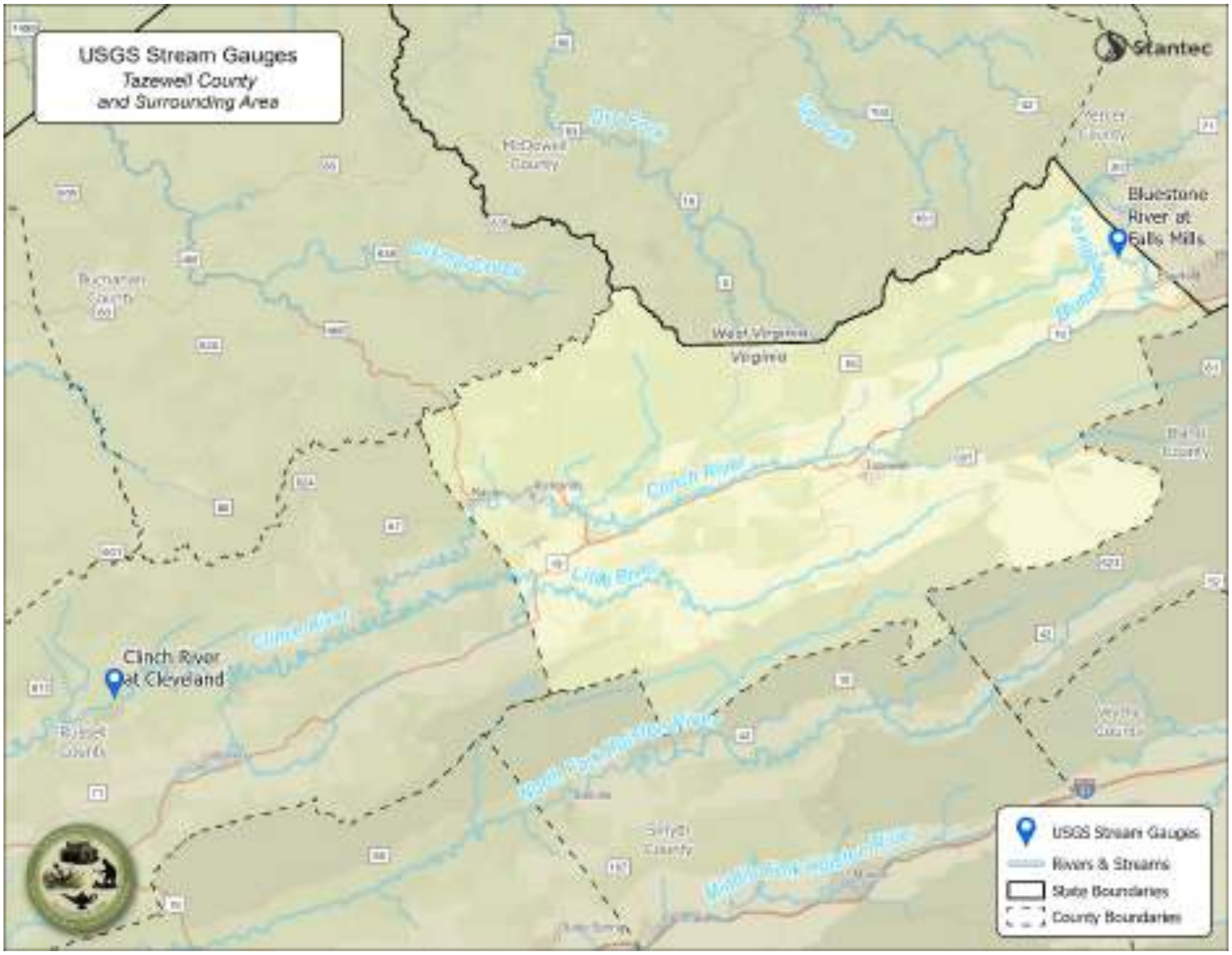


Figure 620: USGS Stream Gauges in Tazewell County and Surrounding Area

The Bluestone River's headwaters begin near Springville, VA, in north-central Tazewell County, and the river flows northeast to Bluefield, where the bends to the northwest and travels towards Falls Mills. The river then flows northeast into West Virginia. Flooding from the Bluestone River has impacted both Bluefield and Falls Mills.

The headwaters of the Clinch River begin southwest of Springville, VA and the river flows south to southwest through most of Tazewell County. The Clinch River has produced most of the significant flooding events that have impacted the more densely populated areas of Tazewell County. The river flows through North Tazewell, Tazewell, Pounding Mill, Cedar Bluff, Richlands, Doran, and Raven.

The peak streamflows of the USGS stream gauge in Cleveland, VA provides insight into when previous flooding events along the Clinch River have occurred. The annual peak streamflow has been recorded since 1921, with four additional previous peak streamflows (1862, 1902, 1907, 1918) also included in the record, dating back to 1862. The highest recording at the site was during the 1977 flood, with a height of 26.40 feet, which is considered the flood of record. Table 65 shows the 20 highest recordings at the Cleveland stream gauge. For reference, the flood stage at this location is 14 feet, moderate flood stage is 19 feet, and major flood stage is 24 feet.

Table 65: 20 highest stream height recordings at Cleveland, VA[34]

Date	Gage Height (ft)
4/5/1977	26.40
1/30/1957	24.40
Feb. 1862	22.80⬩
3/12/1963	22.70
3/18/2002	21.81
1/26/1978	20.87
8/14/1940	20.60
2/6/2020	20.43
3/1/1902	20.30
6/14/1907	20.30
12/22/1926	20.10*
3/17/1973	19.94
1/29/1918	19.90*
5/7/1984	19.46
3/30/1975	18.88
5/7/1971	18.82
3/5/2015	18.66
12/31/1969	18.63
2/11/1994	18.54
2/18/1944	17.95

⬩ Day of occurrence is unknown or not exact.
*Gauge height at different site and(or) datum.

Descriptions of recent or severe flooding events that impacted the county are provided below.

May 2023 Flooding

Heavy rainfall began coming down on the night of May 28, 2023, and by the morning of May 29th, floodwaters inundated several roads in Bluefield, Virginia and the surrounding area. Residents noted that this was the most significant flooding in the Bluefield area within the last five years.[35] In Bluefield,

---

[34] U.S.G.S. (2023). Surface Water for USA: Peak Streamflow. Retrieved on March 7, 2023 from USGS Surface Water for USA: Peak Streamflow

[35] WVNS. (2023) Flooding continues to plague southern West Virginia. Retrieved on May 30, 2023 from Flooding continues to plague south West Virginia (wvnstv.com)

floodwaters completely blocked South College Avenue (SR-102), the main throughfare through downtown, from Tazewell Avenue to Graham Avenue. The flooding, shown in Figure 621, resulted in two to four feet of standing water along South College Avenue and Spring Street.

Figure 621: May 29, 2023 Flooding in Bluefield, Virginia

February 2023 Flooding

Local residents shared information and photographs of flooding that occurred in and around the Doran Bottom area on February 6, 2023. Figure 622 shows Route 67 (Raven Road) completely inundated with water. The next week, on February 17, 2023, the National Weather Service (NWS) issued a flood warning for most of the region through the afternoon due to heavy rain that had started the previous night and carried through the morning. Upwards of two inches of rain fell in a twelve-hour period, causing the Clinch River to rise above flood stage, shown in Figure 623.

Figure 622: Route 67/Raven Road Inundated with Floodwaters on February 6, 2023

Figure 623: February 2023 Flooding[36]

[36] Photo was provided by USACE from a resident's social media post shortly after the flooding occurred.

August 2022 Flood

Afternoon thunderstorms on August 5th stalled in the Richlands area, producing prolonged heavy rainfall. Runoff from the storm resulted in small stream flooding of the Clinch River and its tributaries in the Richlands area. Little Town Hill Creek flooded across Hillcreek Road and US-460 in Doran, with the water reaching a depth of four feet on US-460. A vehicle was stranded on the highway and the occupant had to be rescued by emergency responders. Damages reported in relation to this incident were $10,000. There was also flooding reported on Burnette Street in southwest Richlands. Flood waters did not recede for two hours.[37]

July 2022 Flash Flooding

Severe flash flooding impacted the northwest portion of Tazewell County after several days of heavy rainfall, resulting in significant damage. According to local news reports, the area around Jewell Ridge received up to six inches of rainfall within just a few hours. At least 134 structures incurred structural damage in Buchanan and Tazewell Counties. The Bandy area of Tazewell County suffered the most significant flooding within Tazewell County, examples of which are shown in Figure 624 and Figure 625. Video captured by Tazewell County Emergency Management shows that several buildings in Bandy were flooded with anywhere between 6 inches and 2 feet of water from Indian Creek. Fourteen residents were displaced in Bandy after their homes were damaged or destroyed.[38] Flood waters did not recede for over eight hours. Over 2,000 power outages were reported within the area and many roadways were impassible impassable due to high water. This event resulted in the Governor of Virginia declaring a state of emergency, as well as a federally declared disaster. FEMA individual assistance was estimated at $1.96 million and public assistance, primarily due to road and bridge damages, was estimated at $14 million.[39]

---

[37] National Centers for Environmental Information (NCEI). (n.d.). Storm Events Database. NOAA/NWS. Retrieved on March 9, 2023 from Storm Events Database | National Centers for Environmental Information (noaa.gov)

[38] National Weather Service. (2022). Southwest Virginia Flooding: July 2022. Retrieved on March 9, 2023 from Southwest Virginia Flooding: July 2022 (arcgis.com)

[39] FEMA-4674-DR Preliminary Damage Assessment Report. Retrieved from FEMA-4674-DR-VA.

Figure 624: Flooding in Bandy, VA in July 2022[40]

Figure 625: Flooding in Bandy, VA in July 2022[41]

April 2020 Flood

Heavy rain began during the evening of April 12th and continued through the morning of the 13th, lasting roughly a 12-hour period. Between 1.5 and 5 inches of rain fell across Tazewell County, with isolated 5-inch amounts along the Blue Ridge Mountains. The intense rainfall rates and rapid runoff caused widespread flash flooding of small creeks and streams. The Clinch River at Richlands gauge (RLRV2)

---

[40] WDBJ. (2022). Flooding in Buchanan/Tazewell Counties, VA. Retrieved on March 9, 20223 from Flooding in Buchanan/Tazewell Counties, VA (wdbj7.com).

[41] WDBJ. (2022). Flooding in Buchanan/Tazewell Counties, VA. Retrieved on March 9, 20223 from Flooding in Buchanan/Tazewell Counties, VA (wdbj7.com).

crested at 12.77 feet, just below “Moderate” flood stage of 13 feet. This was the 12th highest on record at this gauge, with records dating back to 1944. Several roads were closed and damaged due to the flooding. Virginia Department of Transportation (VDOT) reported very significant damage to road infrastructure across numerous counties with damage totals exceeding $1.2 million. Some homes that were flooded in February 2020, were flooded again less than 3 months later. This event caused $144,896 worth of property damage in the Pounding Mill and surrounding areas.[42]

February 2020 Flood

Rainfall during a 3-day period from February 5th to February 7th produced some of the most significant flooding Tazewell County had experienced in over a decade. Numerous NWS Cooperative stations recorded one-day and two-day rainfall records. The most significant flooding within Tazewell County occurred along the Clinch River and its tributaries in the southwestern portion of the county, where a flash flood emergency was issued. However, flooding was reported throughout the county, including Burkes Garden, Raven, Richlands, and Yards.

The Richlands stream gauge (RLRV2) crested at 14.33 feet, qualifying as a “Moderate” flood stage (13 feet). This was the ninth highest record at this gauge. Flooding of low-lying areas was extensive from Cedar Bluff downstream through Richlands and into the Doran and Raven communities. News reports mentioned water up to four feet deep in parts of Richlands. There were multiple evacuations conducted and homes and businesses flooded along with roads throughout the area, some of which were damaged.

Preliminary damages for Tazewell County were estimated at over $1.8 million by the Virginia Department of Emergency Management (VDEM). This included $298,300 in damage to public property, $626,100 in residential damage and $882,900 to commercial property. An additional $218,500 in road damage was reported by VDOT. A state of emergency was declared by the Virginia Governor for several counties in southwest Virginia due to the flooding, including Tazewell County.

[42] National Centers for Environmental Information (NCEI). (n.d.). Storm Events Database. NOAA/NWS. Retrieved on March 9, 2023 from Storm Events Database | National Centers for Environmental Information (noaa.gov)

Figure 626: Flooding in Richlands, February 2020

July 2015 Flooding

On July 5th slow-moving thunderstorms crossed over Tazewell County producing heavy rainfall. A flash flood warning was issued for Tazewell County by the NWS after the radar showed 1-2 inches of rain had already fallen by the early evening, with more expected. Total rainfall amounts reached 2.5-3 inches in a 3-hour period ending around 10 PM over parts of northeastern Tazewell County which produced substantial flash flooding and debris flows in several locations.

The worst flooding occurred along Laurel Fork near the Town of Pocahontas where 25 homes, 5 businesses and 2 mobile homes were damaged or destroyed. Total damage estimates reached over $4.4 million, primarily due to a single business that was uninsured and destroyed. Multiple roads across northeast Tazewell County were closed due to flooding and mudslides.

May/June 2004 Flooding

During late May and early June excessive precipitation resulted in flooding throughout the region on a number of occasions. Severe thunderstorms in western Tazewell County dumped over 5 inches of rain within a 2-hour period beginning late in the evening of May 24th and continuing through the early morning hours of May 25th. This resulted in flooding along the Clinch River and its tributaries in Cedar Bluff and the areas downstream through Raven. Water inundated several major roads, including State Route 67 and US-460 and mudslides blocked or damaged a number of roads in the area. In total, the event resulted in over $800,000 worth of property damage reported via NCEI. Nearly 200 private residences were destroyed or damaged, including 44 mobile homes, 79 homes with major damage, an additional 71 homes with minor damage. Additionally, 7 businesses were destroyed or damaged and 35 vehicles received damage. Fifteen people had to be evacuated during the event.[43]

Roughly two weeks later, severe thunderstorms passed over Tazewell County again, causing more significant flooding. Flooding occurred in eastern Tazewell County on June 12, 2004. During two hours of rain, Bluefield accumulated 2.37 inches of precipitation. Preliminary flood damage indicated that at least 20 houses and 12 businesses were impacted by the flooding. Areas affected include South College Avenue, Main Street (at intersection of Beaver Pond Creek and Whitney Branch), College Avenue, Stadium Drive and Leatherwood Lane.[44] In western Tazewell County, the community of Short Gap experienced flooding and mudslides. Flooding was also reported in the Doran area and along Town Hill Creek.

The culmination of events resulted in a federal disaster being declared (DR-1525) for flooding events that occurred between May 24th and June 26th, 2004.

November 2003

Moderate to heavy rain fell over most of Tazewell County and the region beginning the night of November 18th through the morning of November 19, 2003. The Bluefield area experienced significant flooding that damaged a number of businesses. The heavy precipitation caused the Clinch River to surpass flood stage and water continued to rise during the day on November 19th. This resulted in flooding all along the Clinch River and its tributaries throughout Tazewell County. In the Town of Tazewell a car lot flooded and there was damage to local roads. Route 637 was closed due to flooding in portions of the county and Second Street in Richlands was blocked for the first time since 1977. 26 homes were destroyed, 14 had major damage, and 5 had minor damage. One business was destroyed, 5 others had major damage, and 17 cars were flooded. In total, there was over $10 million worth of property damage in the county. The event resulted in a federal disaster (DR-1502) being declared for several counties in the region, including Tazewell County.

March 2002

Heavy rains on March 18, 2002, produced major flash flooding across the region. In Tazewell County, numerous roads were flooded and some received damage from wash outs. Forty-two homes in the county suffered major damage and several cars were flooded. Fifty people had to be evacuated during the event. The event resulted in a federal disaster declaration for the region (DR-1406). The total estimated damage in Tazewell County was nearly $2.8 million worth of damage.

July 2001

Severe thunderstorms impacted Tazewell County starting the morning of July 8, 2001. The storms produced damaging winds and major flash flooding across the county, with the most significant damage occurring in the Richlands area. Over 1,700 homes and business received major damage, including a large automobile dealership that received damage to the building and several vehicles. Numerous roads were closed throughout the county, and some were damaged by flooding and/or mudslides. The event

---

[43] National Centers for Environmental Information (NCEI). (n.d.). Storm Events Database. NOAA/NWS. Retrieved on March 9, 2023 from Storm Events Database | National Centers for Environmental Information (noaa.gov)

[44] Cumberland Plateau Planning District Commission. (2018). Hazard Mitigation Plan Update. Retrieved March 10, 2023 from http://cppdc.org/Reports/Mitigation%20Plan%20Edit.pdf.

caused over $28 million worth of damage in the county, with over $950,000 worth of property damage reported in the Richlands area alone.

April 1977

In early April of 1977, heavy rainfall across the region resulted in one of the worst flooding events ever recorded in the area. The flood serves as the flood of record on the Clinch River and all subsequent flood events are compared to this event. The flooding caused over $11 million in damages in the area, including heavy agricultural losses. The event resulted in a federal disaster declaration (DR-530) for the region.

The event produced flooding in all low-lying areas of Tazewell County, including along the Clinch River and the Bluestone River. In Bluefield, the business district was incapacitated due to flooding. Virginia Street and College Avenue were some of the areas affected by the rain event. Traffic rerouted to the side streets, with voluntary evacuation of residents.

Flood Hazard Analysis

Location

Tazewell County falls almost entirely in the Valley and Ridge Province of the Appalachian Highlands. The Valley and Ridge Province is bounded by the Appalachian Plateau to the west and the Blue Ridge Mountains to the east, as shown in Figure 627.

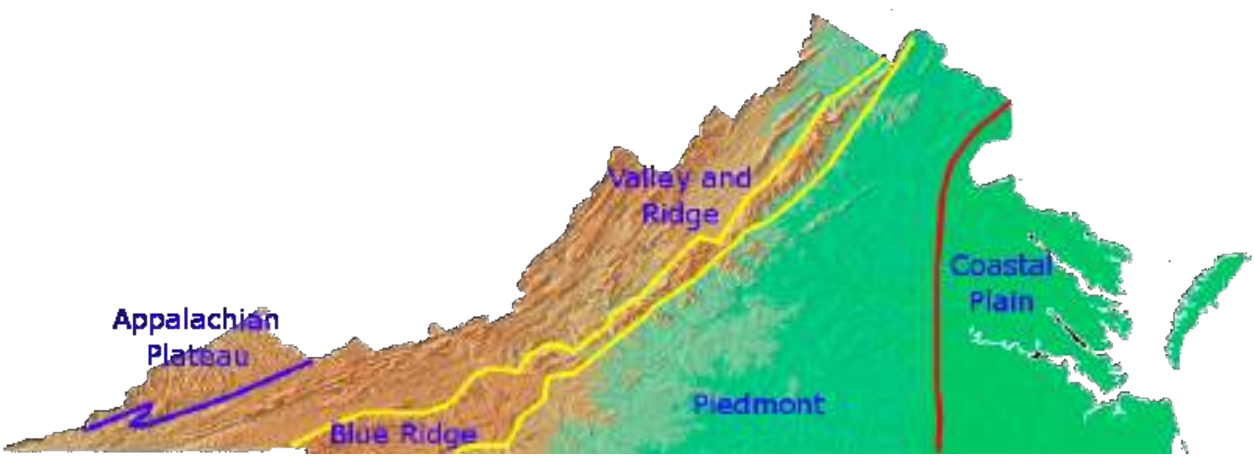


Figure 627: Virginia Physiographic Provinces[45]

The county's topography is shown in Figure 628.[46] The Appalachian Plateau forms high ridges along the northwestern and northern borders of Tazewell County. Jewell Ridge, Bear Wallow, Pocahontas, and Bluefield are some of the communities in found in these areas. The rest of the county is comprised of long mountain ridges that travel in a southwest to northeast direction, separated by valleys. This portion of the county is home to the headwaters for a number of rivers, including the Clinch River, the Holston

[45] Earth Science Review. (n.d.) Virginia's Physiographic Provinces. Retrieved on March 8, 2023 from Physiographic Provinces - Earth Science Review (weebly.com)

[46] Virginia Geographic Information Network (VGIN). (2019). Virginia Most Recent Imagery MrSID and DEM Download. Retrieved on March 8, 2023 from Virginia Most Recent Imagery MrSID and DEM Download (arcgis.com)

River (North Fork), the Dry Fork (feeds into Tug Fork in West Virginia), and the Bluestone River. Clinch Mountain, Garden Mountain, and the East River Mountain form the high ridges in the south and eastern areas of the county.

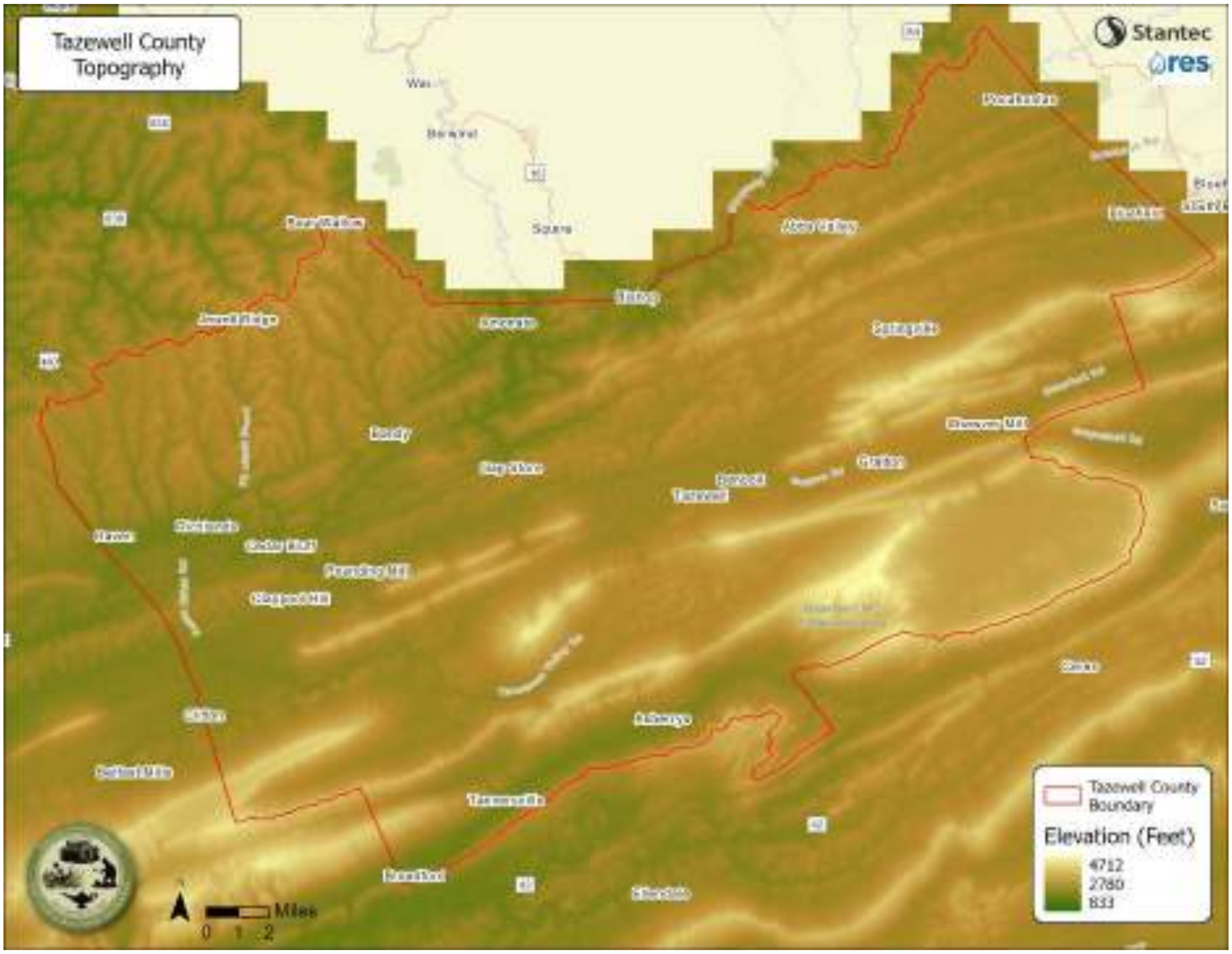


Figure 628: Tazewell County Topography

Tazewell County is characterized by high mountain ridges with steep slopes, interspersed with valleys. Throughout much of the county, the only flat land is found on valley floors. Due to the topography of the county, development typically occurs in the valleys, often along the county's rivers and streams. FEMA produces maps of special flood hazard areas based on riverine flooding. These include the areas with a 1.0% and 0.2% annual chance of flooding (the 100-year flood and 500-year flood zones, respectively). Given the county's development patterns, a substantial amount of development falls within one of these zones. Figure 629 shows the 100-year and 500-year flood zones located throughout the county.

In addition to flooding that occurs in the mapped flood hazard areas, county officials noted that flooding is possible within most low-lying areas of the county, depending on where rainfall occurs. This is also evident from recent flooding events, as well as conversations held during meetings with residents and county officials. The North Tazewell and Tazewell communities were highlighted as areas where flooding has occurred outside of the special flood hazard areas. Other communities throughout the county are likely vulnerable to similar flooding incidents, where localized heavy precipitation or clogged streams may produce flooding outside of expected areas.

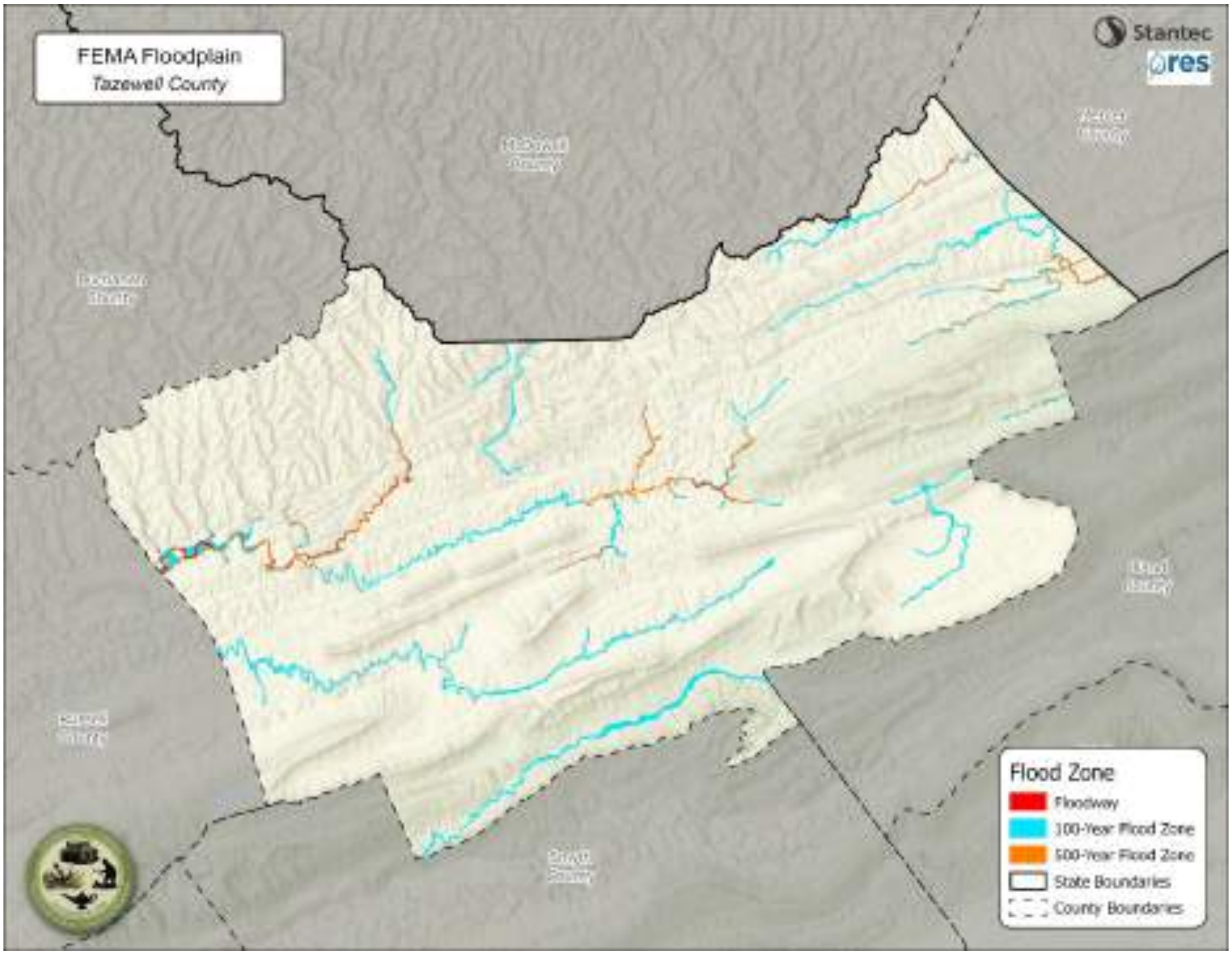


Figure 629: Tazewell County FEMA Floodplain

Building and Parcel Data

Building footprint and parcel data was provided by the Tazewell County Engineering Department for use in the flood hazard analysis. These datasets were used in unison to assess potential flood risk to structures within Tazewell County. The overall flood risk was assessed by considering the likelihood a building or parcel will flood in a given year (i.e., which flood zone the building or property falls in) alongside the improvement value of at-risk parcels. In total, there are an estimated 26,271 buildings and 32,040 parcels in Tazewell County.

Critical Facilities

Critical facilities are structures or systems that provide essential services and functions for a community. These facilities are vital to continued operations and recovery following a natural disaster or public health crisis. Table 66 provides a full list of Tazewell County's critical facilities, presented by community lifeline.[47] These facilities were identified by reviewing the CPPDC's Hazard Mitigation Plan, Tazewell County's Comprehensive Plan, and input from the Planning Team comprised of County officials.

[47] FEMA Community Lifelines. Retrieved from Community Lifelines | FEMA.gov.

Table 66: Tazewell County Critical Facilities

Energy	Hazardous Materials
AEP Power Substation - Near SWCC Walking Trail	Tazewell County Landfill
Food, Water, Shelter	Bluefield Wastewater Treatment Plant
Labor of Love Mission*[1]	Falls Mills Wastewater Treatment Plant
Farm Market Fresh for Seniors (SFMNP)*[2]	Richlands Wastewater Treatment Plant
Clinch Valley Community Action*[1]	Tazewell Wastewater Treatment Plant
Appalachian Agency for Senior Citizens*[2]	Wardell Wastewater Treatment Plant
Abbs-Valley-Boissevain Elementary School	**Health and Medical**
Cedar Bluff Elementary	Clinch Valley Medical Center
Dudley Primary	Carilion Tazewell Community Hospital
Graham Middle School	Tazewell County Health Department
Richlands Elementary School	**Safety and Security**
Richlands High School	Tazewell County Sheriff's Office
Richlands Middle School	Richlands Police Department
Tazewell High School	Pocahontas Police Department
Tazewell Intermediate School	Cedar Bluff Police Department
Tazewell Middle School	Bandy Fire Department Fire and Rescue
Tazewell Primary School	Bluefield Fire Department
Southwest Virginia Community College (SWCC	Pocahontas Fire Department
Four Seasons YMCA	Thompson Valley Fire Department
Bluefield Water Treatment Plant	Richlands Rescue
Richlands Water Treatment Plant	Tazewell County EMS Station 1
Pocahontas Water Treatment Plant	Tazewell County EMS Station 2
Bandy Community Center	Town of Tazewell EMS
Thompson Valley Community Center	Tannersville RS
Burke's Garden Community Center	Tazewell County Emergency Management
	Tazewell County District Court
	Virginia State Police Area 28

[1],[2] – Co-located with another critical facility, indicated by a matching number.

Riverine Flood Analysis

Riverine flooding presents a risk to buildings and infrastructure (including critical facilities) as well as populations, especially when development occurs on land within the floodplain. In Tazewell County, the steep relief of the mountainous terrain led to most development occurring in valleys, often within the floodplain. Pairing FEMA special flood hazard area data with spatial data for the county's structures, critical facilities, and socially vulnerable populations, the project team conducted a spatial analysis to identify structures, facilities, and populations potentially at-risk to flood.

Buildings and Parcels

A structure's flood risk is associated with several factors, such as its location within flood hazard areas, and any implemented mitigation, such as first floor elevation, dry floodproofing, or presence of flood control structures. For example, buildings constructed to modern building codes, after the adoption of the county's Flood Damage Prevention Ordinance, may carry less risk than older structures due to how they were constructed. Table 67 presents the results of the spatial analysis of buildings within FEMA mapped flood hazard areas. This analysis does not account for building elevations or other structure-level mitigation measures. It should also be noted that flooding occurs outside of mapped floodplains.

Table 67 presents a summary of the buildings that are within FEMA flood zones and the percentage of total structures found in each flood zone. Table 68 presents a summary of the parcels located in the various FEMA flood zones within Tazewell County. Each building or parcel is only included in one of the FEMA flood zones to prevent double counting. If a building is located in more than one FEMA flood zone, it was counted in the FEMA flood zone with a higher associated risk (i.e., a building in both the 0.2% Annual Chance Flood Zone and the 1% Annual Chance Flood Zone would only be counted in the 1% Annual Chance Flood Zone.)

Table 67: Building Footprints in FEMA Flood Zones

FEMA Flood Zone	Total # of Structures	Percentage of All Structures
0.2% Annual Chance (500-year)	525	2%
1% Annual Chance (100-year)	1,996	8%
Floodway	387	1%
Total # of Structures at Risk	2,908	11%

**Each building is only included in one of the FEMA Flood Zones to prevent double counting.*

Table 68: Parcels in FEMA Flood Zones

FEMA Flood Zone	Total # of Parcels	Total Improvement Value of Parcels**	Percentage of All Parcels
0.2% Annual Chance (500-year)	435	$ 274,915,300	1%
1% Annual Chance (100-year)	2,775	$ 217,542,200	9%
Floodway	1,594	$ 32,042,700	5%
Total	4,804	$ 524,500,200	15%

**Each parcel is only included in one of the FEMA Flood Zones to prevent double counting.*
***Value of improvements may exclude the value of tax-exempt improvements.*

The parcels layer was used to estimate the value of property at risk to riverine flooding. These values are based on tax assessor data provided by Tazewell County and does not include the value of the land, only the improved structures on impacted parcels. It should be noted that some parcels included in the table above may be partially within a flood zone, and that the improvement (e.g., structure) on the parcel may be located outside of the flood hazard area. As noted in Table 68, the estimated total value associated with improved parcels within flood hazard areas is nearly $525 million.

Figure 630 – Figure 639 show areas throughout the Tazewell County where there are clusters of buildings located in the FEMA flood zones.

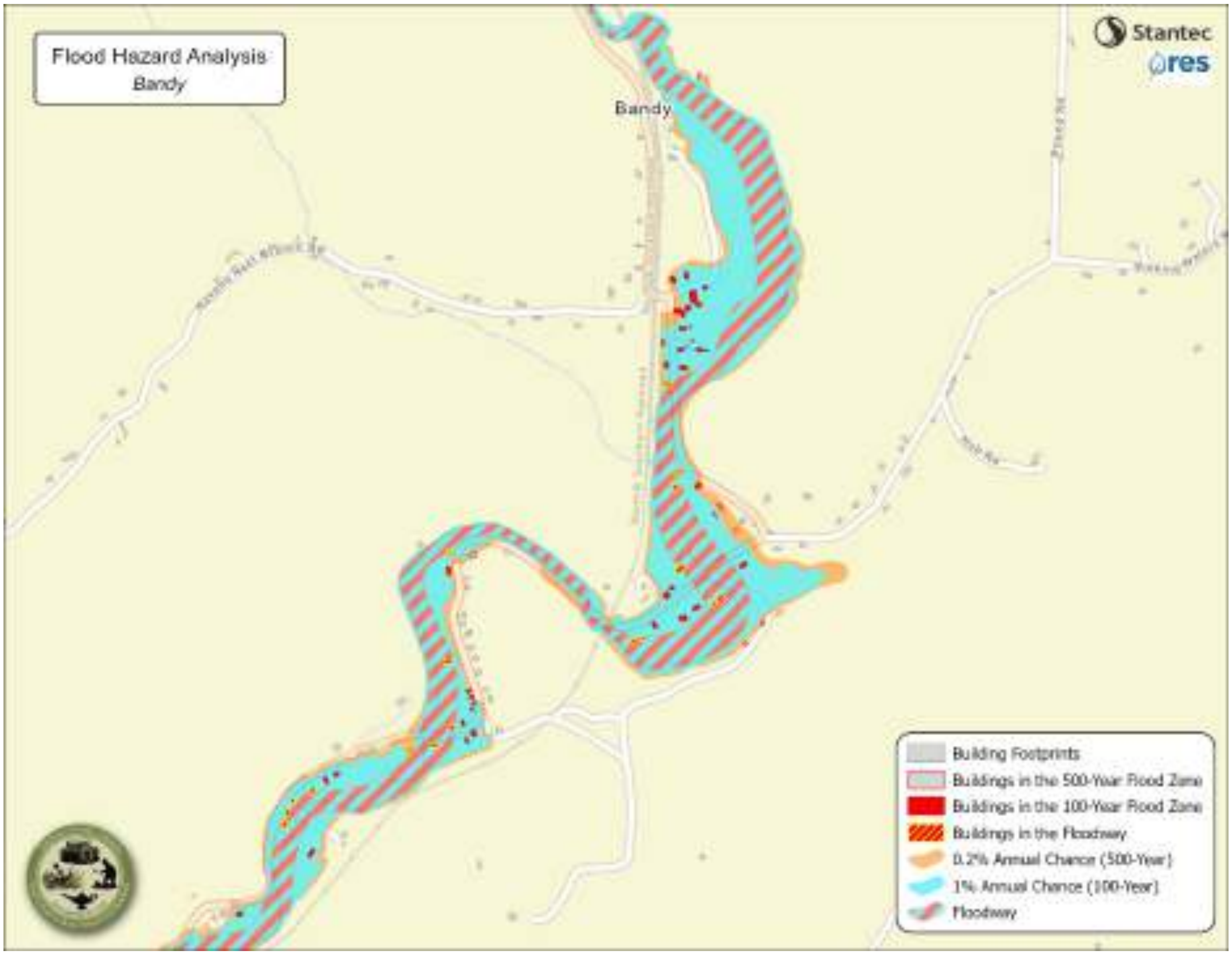


Figure 630: Flood Hazard Analysis – Bandy Area

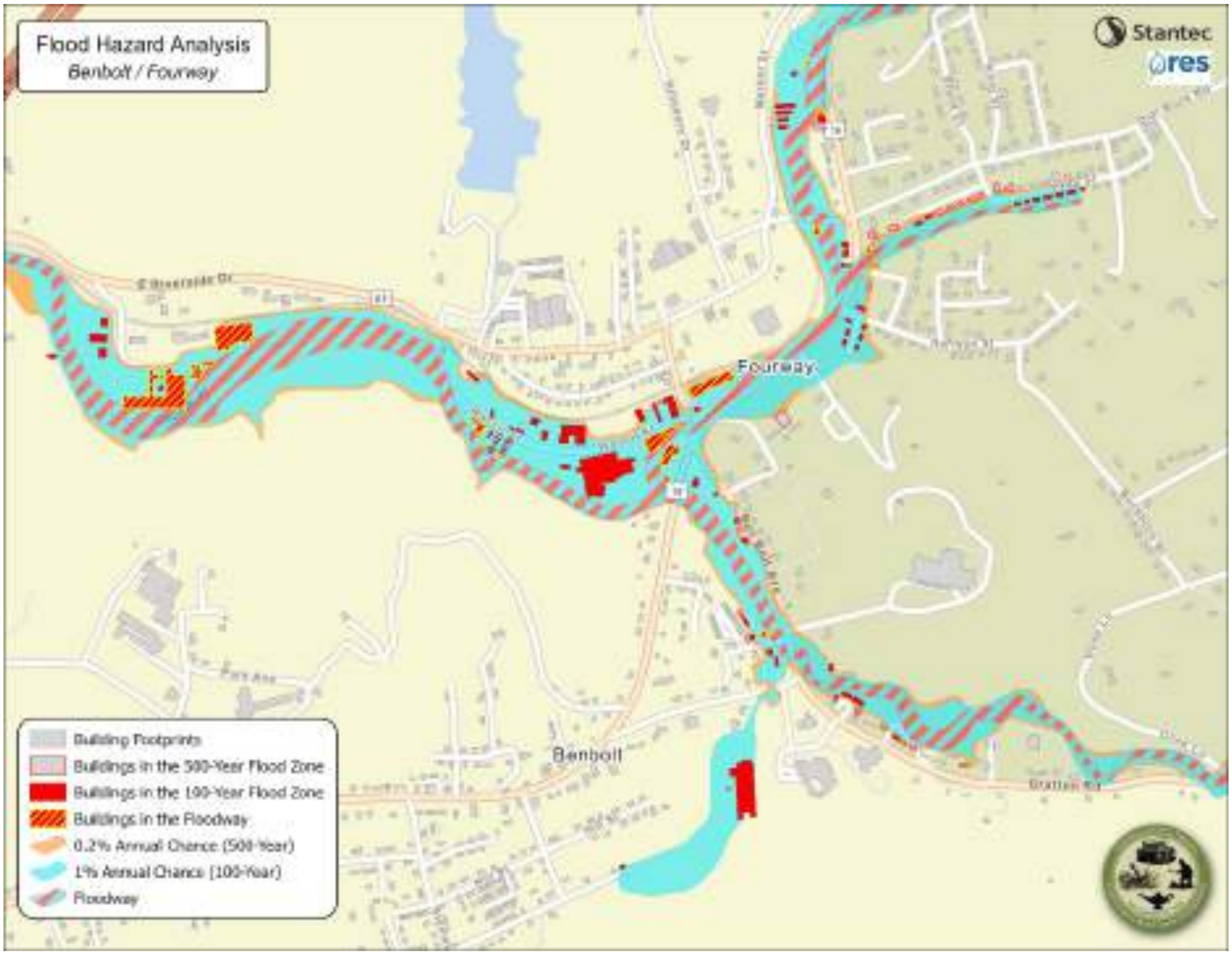


Figure 631: Flood Hazard Analysis – Benbolt/Fourway Area

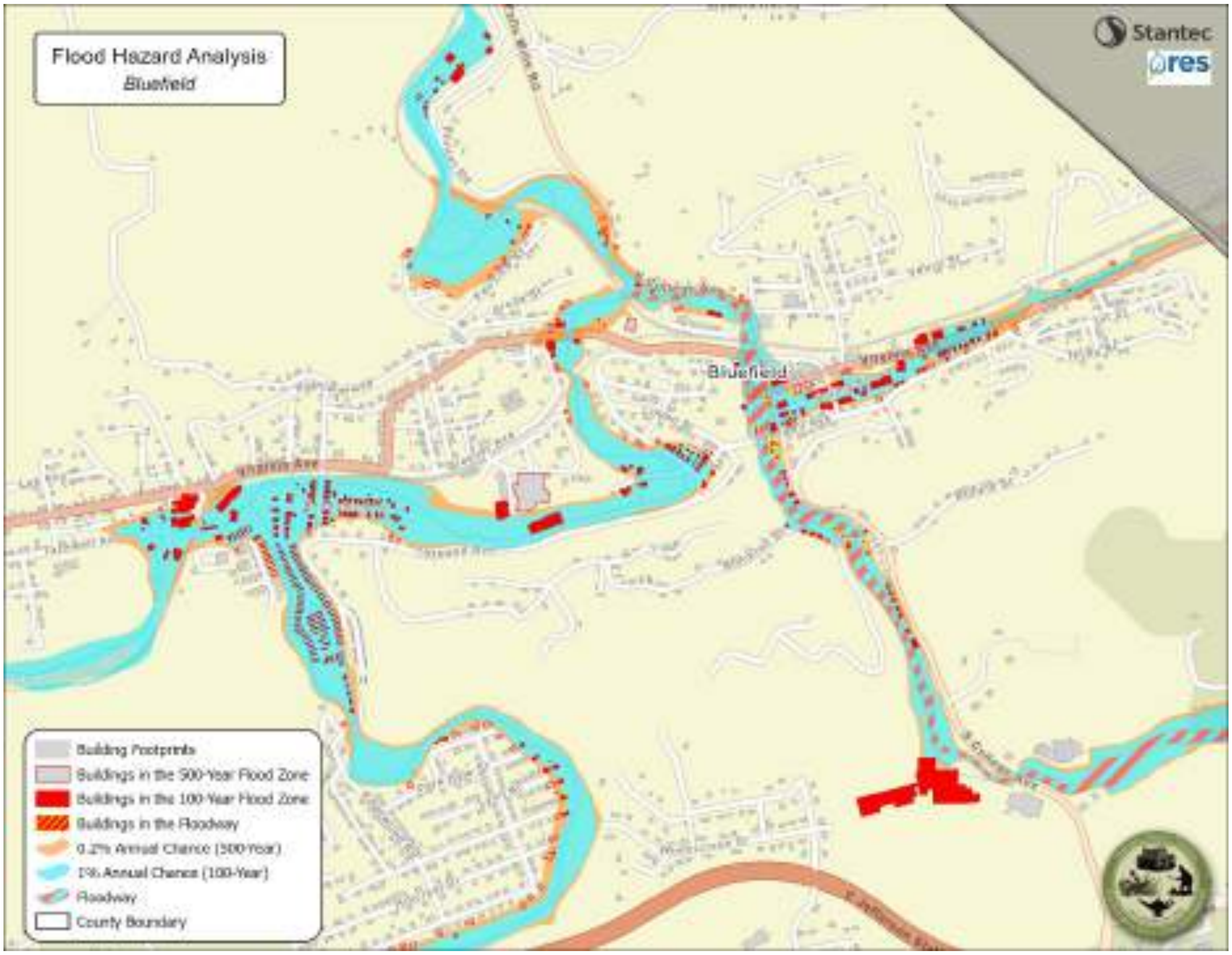


Figure 632: Flood Hazard Analysis – Bluefield Area

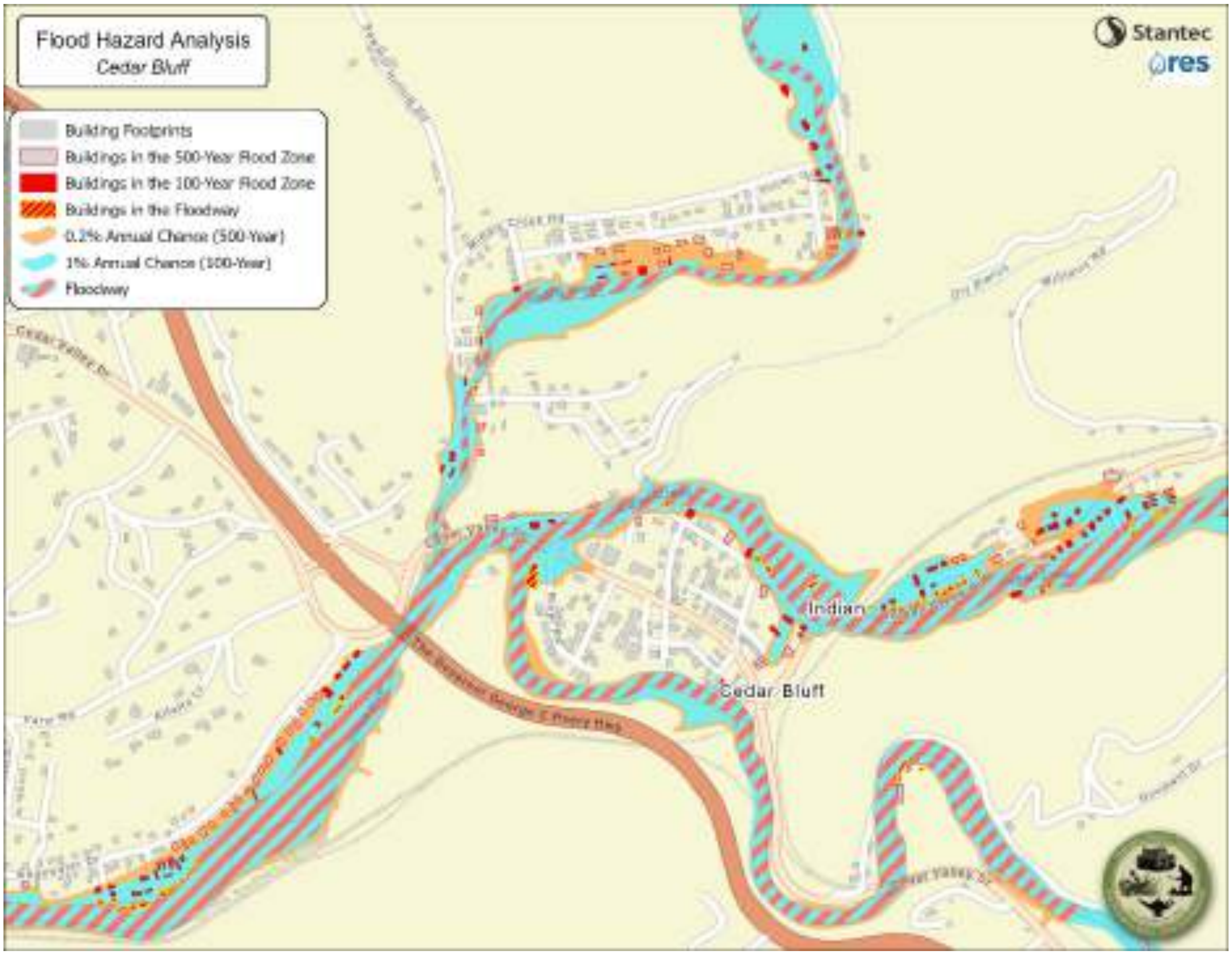


Figure 633: Flood Hazard Analysis – Cedar Bluff Area

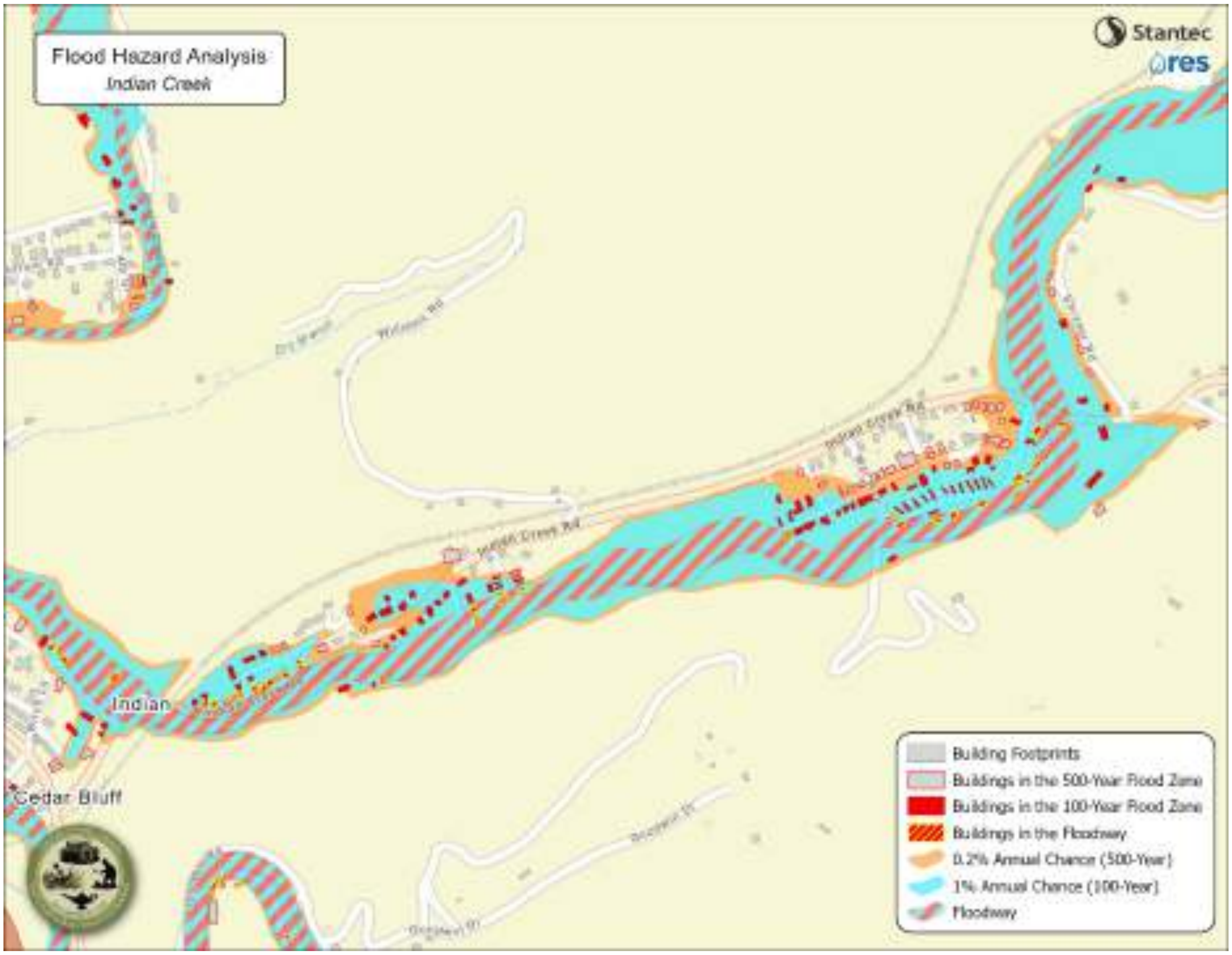


Figure 634: Flood Hazard Analysis – Indian Creek Area

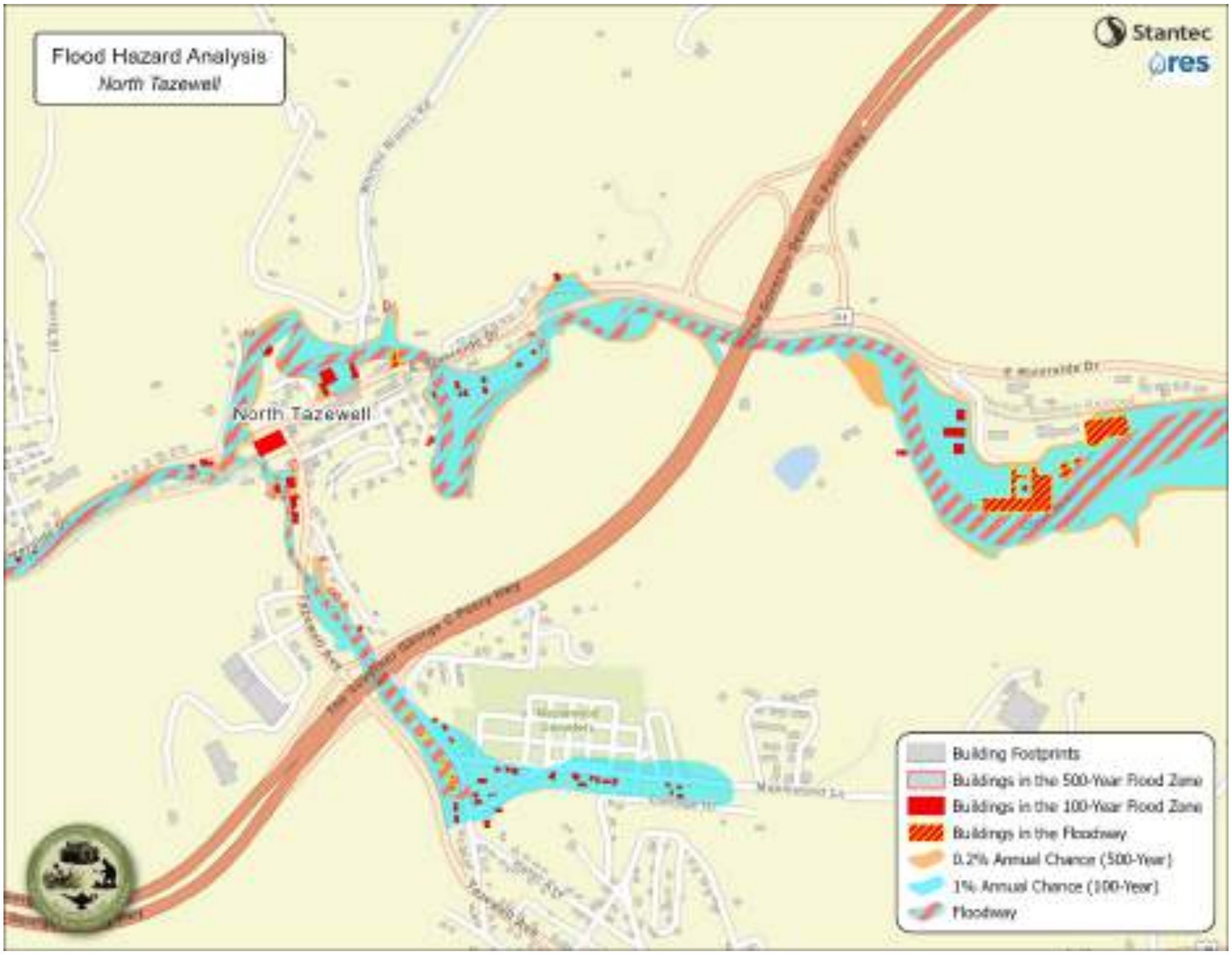


Figure 635: Flood Hazard Analysis – North Tazewell Area

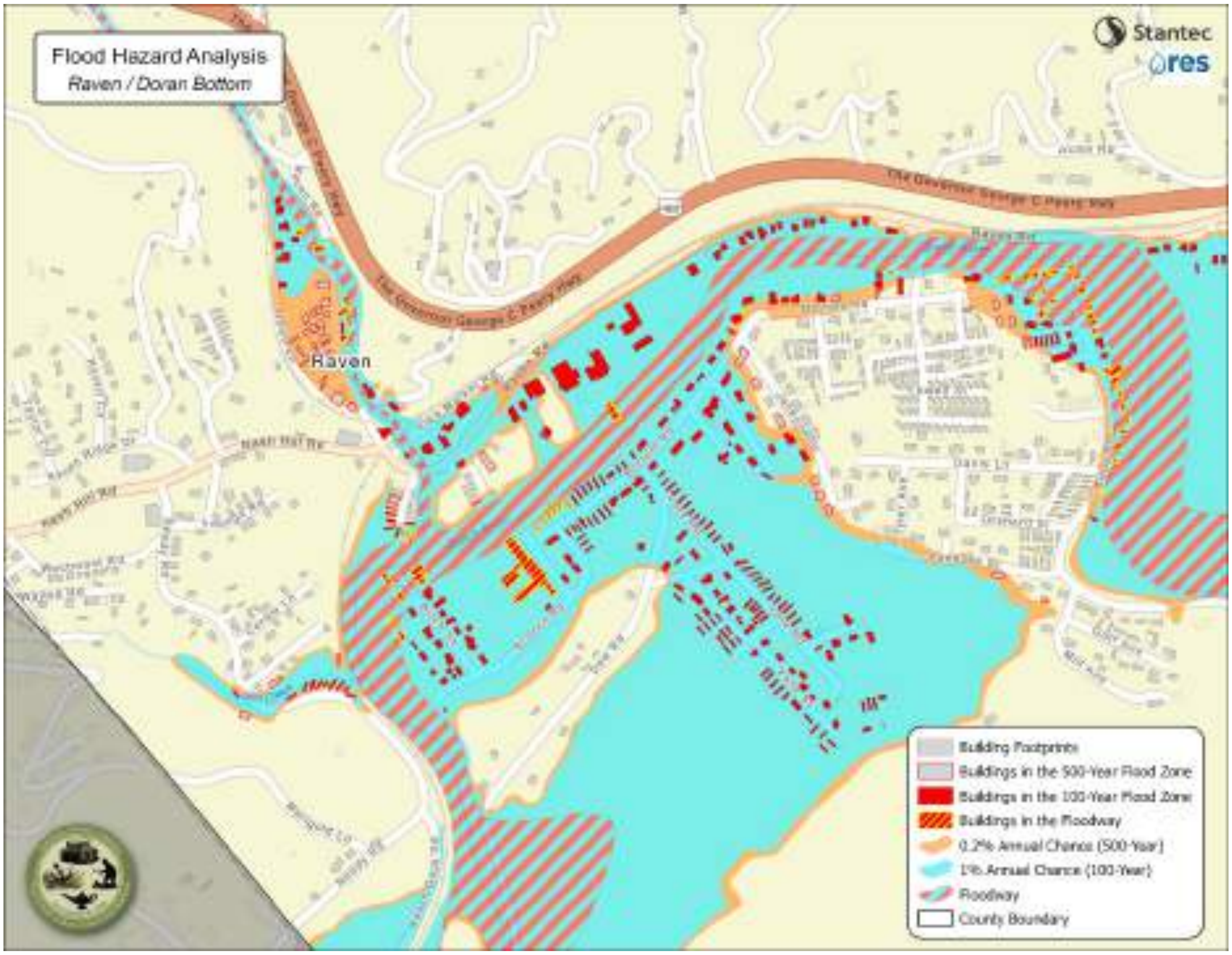


Figure 636: Flood Hazard Analysis – Raven/Doran Bottom Area

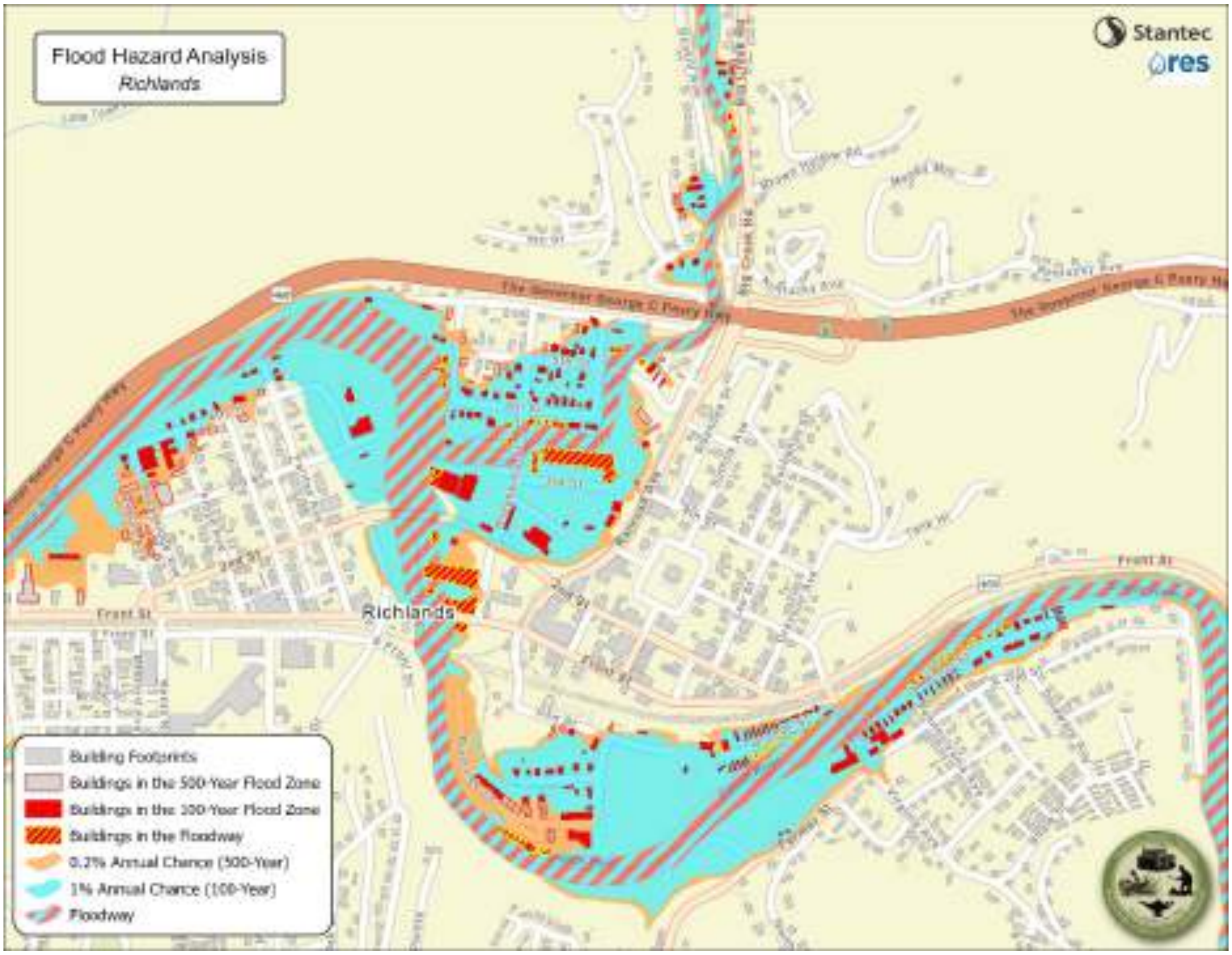


Figure 637: Flood Hazard Analysis – Richlands Area

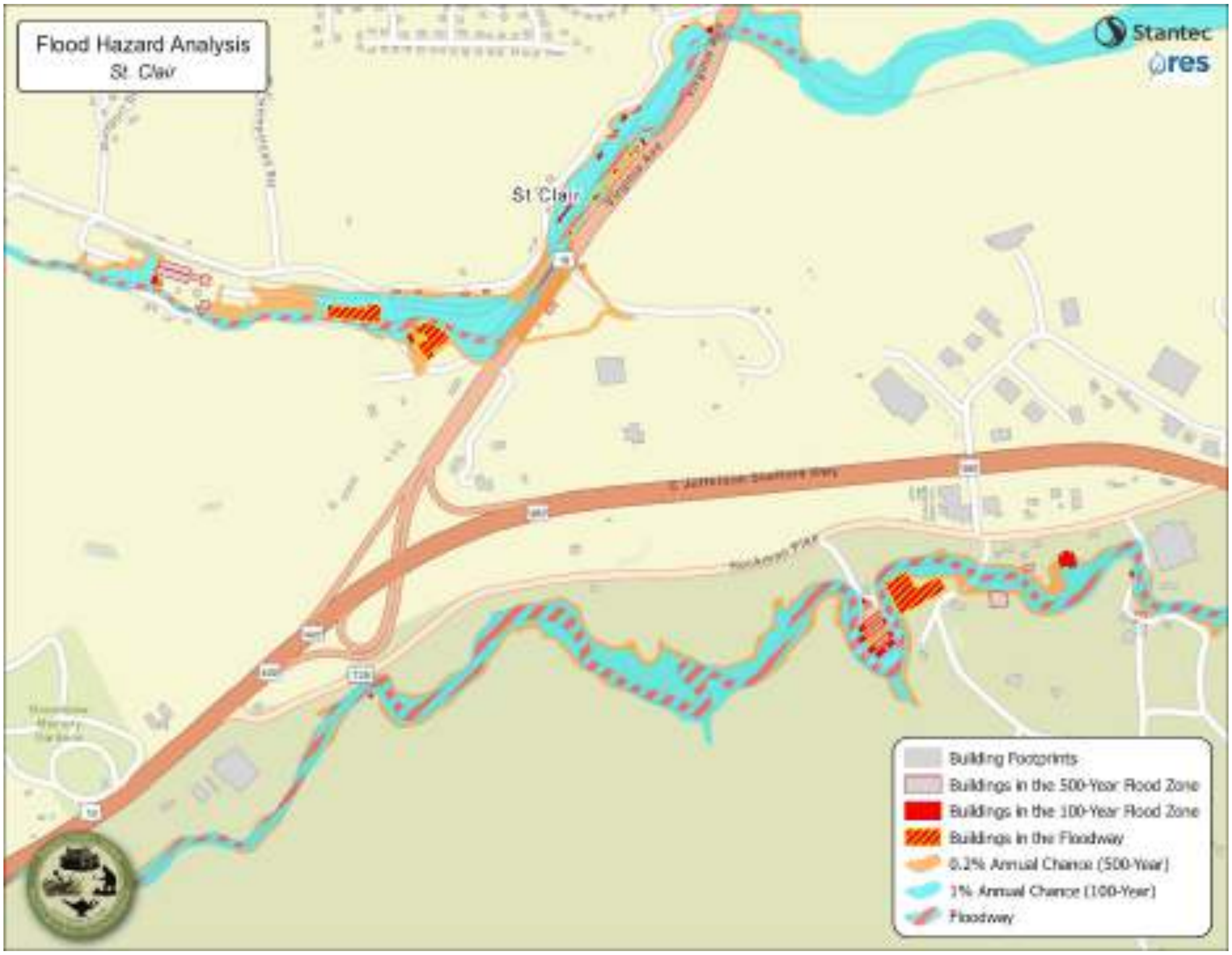


Figure 638: Flood Hazard Analysis – St. Clair Area

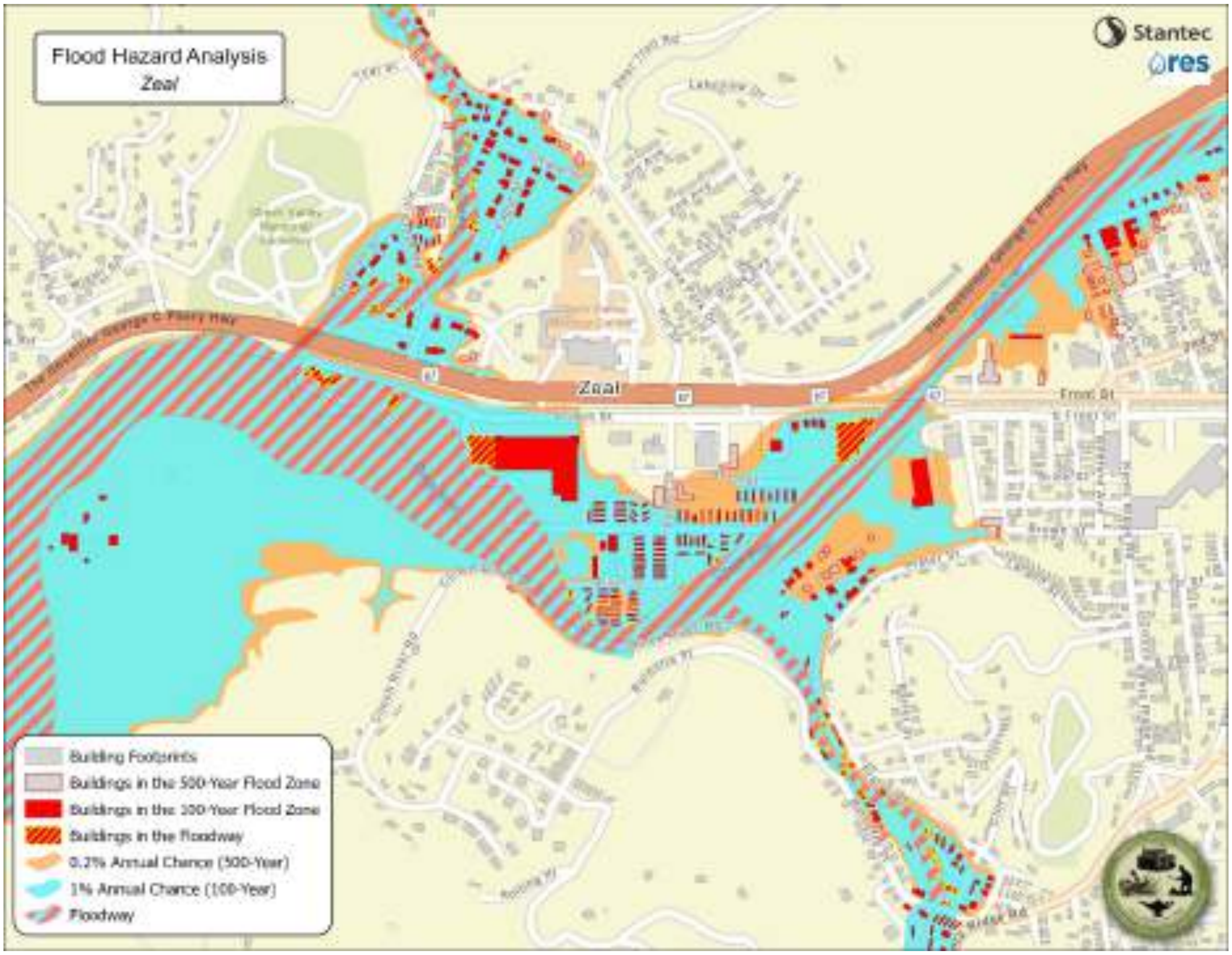


Figure 639: Flood Hazard Analysis – Zeal Area

Critical Facilities

GIS analysis was used to determine the number of critical facilities within flood hazard areas. Many of the county's critical facilities fall in special flood hazard areas or have been impacted by past flooding events.

In all, there are 12 out of 49 identified critical facilities located in FEMA flood hazard areas; all 12 identified critical facilities fell in the FEMA 1.0% annual chance (100-year) floodplain. Table 69 has the at-risk critical facilities within or partially within flood hazard areas highlighted in yellow.

Table 69: Critical Facilities Flood Risk Analysis

Energy	Hazardous Materials
AEP Power Substation	Tazewell County Landfill
Food, Water, Shelter	Bluefield Wastewater Treatment Plant
Labor of Love Mission*[1]	Falls Mills Wastewater Treatment Plant◆
Farm Market Fresh for Seniors (SFMNP) *[2]	Richlands Wastewater Treatment Plant
Clinch Valley Community Action*[1]	Tazewell Wastewater Treatment Plant
Appalachian Agency for Senior Citizens*[2]	Wardell Wastewater Treatment Plant
Abbs-Valley-Boissevain Elementary School	**Health and Medical**
Cedar Bluff Elementary	Clinch Valley Medical Center
Dudley Primary	Carilion Tazewell Community Hospital
Graham Middle School	Tazewell County Health Department
Richlands Elementary School	**Safety and Security**
Richlands High School	Tazewell County Sheriff's Office
Richlands Middle School	Richlands Police
Tazewell High School	Pocahontas Police Department
Tazewell Intermediate School	Cedar Bluff Police Department
Tazewell Middle School	Bandy Fire Department Fire and Rescue
Tazewell Primary School	Bluefield Fire Department
Southwest Virginia Community College	Pocahontas Fire Department◆
Four Seasons YMCA	Thompson Valley Fire Department
Bluefield Water Treatment Plant	Richlands Rescue
Richlands Water Treatment Plant	Tazewell County EMS Station 1
Pocahontas Water Treatment Plant	Tazewell County EMS Station 2
Bandy Community Center	Town of Tazewell EMS
Thompson Valley Community Center	Tannersville RS
Burke's Garden Community Center	Tazewell County Emergency Management
-	Tazewell County District Court
-	Virginia State Police Area 28

[1],[2] – Co-located with another critical facility, indicated by a matching number.

◆ – Not included in the flood hazard analysis (unknown location).

Socially Vulnerable Populations

In the U.S., low-income and minority populations are more likely to live in flood zones.[48] One way to consider exposure of socially vulnerable populations to flood risk in Tazewell County is by assessing the number of buildings at-risk to flood within census tracts with high social vulnerability. The U.S. Agency for Toxic Substances and Disease Registry (ATSDR), in conjunction with the Centers for Disease Control and Prevention (CDC), has published a social vulnerability index (SVI). The SVI uses 16 U.S. Census statistics to map socially vulnerable populations. The intent of the program is to plan support for communities that will most likely need support before, during, and after a public health emergency or a natural disaster. The statistics used include poverty, lack of vehicle access, and housing conditions, among others, which are collected at a census tract level and grouped into four themes. Each tract receives a separate ranking for each of the themes, as well as an overall ranking of social vulnerability.[49] Figure 640 shows the overall social vulnerability ranking, compared statewide across Virginia, for Tazewell County's 13 census tracts. The majority of Tazewell County's census tracts are categorized as having medium-high socially vulnerability, with two census tracts categorized as having high social vulnerability. These two tracts include the area between Jewell Ridge Road and US-460, as well as Richlands, Claypool Hill, and Wardell.

[48] Laura A. Bakkensen et al, Sorting over flood risk and implications for policy reform, *Journal of Environmental Economics and Management* (2020). DOI: 10.1016/j.jeem.2020.102362

[49] Agency for Toxic Substance and Disease Registry. (2022). At A Glance: CDC/ATSDR Social Vulnerability Index. Retrieved April 12, 2023 from At A Glance: CDC/ATSDR Social Vulnerability Index | Place and Health | ATSDR.

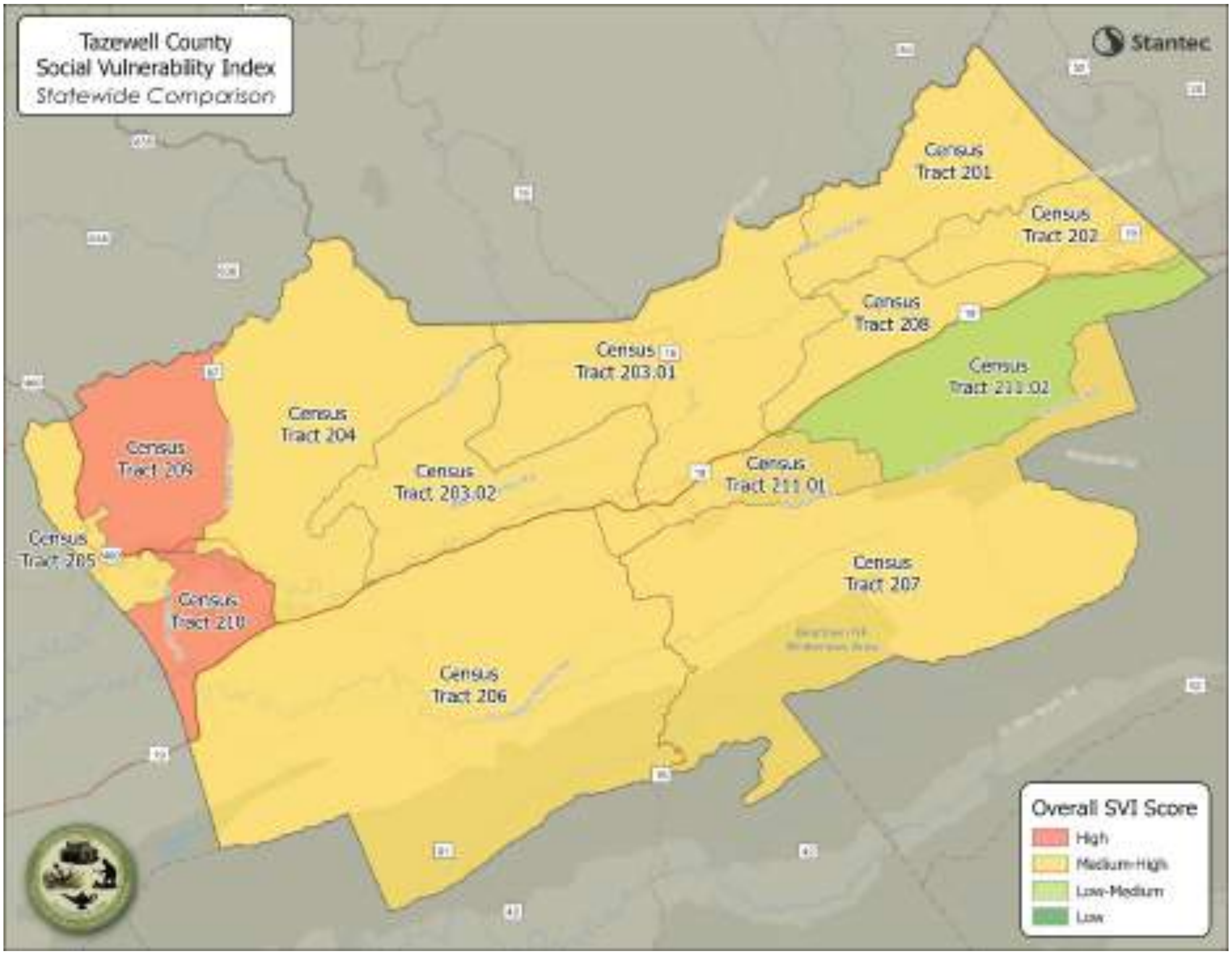


Figure 640: Tazewell County SVI[50]

A GIS-based intersect analysis was performed using buildings within flood risk areas (FEMA Floodway, 1.0% annual chance, and 0.2% annual chance flood zones) and social vulnerability census tract ratings from the CDC/ATSDR. Results show that the majority of buildings in Tazewell County within flood hazard areas are located in census tracts defined as having medium-high or high social vulnerability. Of the 2,908 buildings at risk from flood, 601 (21%) are located within tracts with “high” social vulnerability and 2,236 (77%) are located within tracts with " medium-high" social vulnerability. Table 610 shows the total number and percentage of buildings within a flood hazard area separated by CDC/ATSDR social vulnerability rating. The Number of Structures At-Risk to Flooding provides the number of structures within each SVI category within FEMA’s flood hazard areas (floodway, 100-year floodplain, and 500-year floodplain). The Percent of Total Buildings At-Risk to Flooding provides a percentage of the total number of at-risk structures within Tazewell County.

[50] Agency for Toxic Substance and Disease Registry. (2022). At A Glance: CDC/ATSDR Social Vulnerability Index. Retrieved April 12, 2023 from CDC/ATSDR Social Vulnerability Index (SVI)

Table 610: Social Vulnerability of Buildings At-Risk to Flooding

Social Vulnerability of Buildings At-Risk to Flooding

SVI Rating	Census Tract(s)	Number of Structures At-Risk to Flooding	Percent of Total Buildings At-Risk to Flooding:
Low-Medium:	211.02	81	3%
Medium-High:	201, 202, 203.01, 203.02, 204, 205, 206, 207, 208, 211.01	2,226	77%
High:	209, 210	601	21%
Total:		2,908	100%

Table 611 and Table 612 provide even further breakdown of the at-risk buildings within the two census tracts within the county with high social vulnerability. The percentage of structures at-risk for these tracts is comparable to the overall percentages for the county.

Table 611:Breakdown of At-Risk Buildings in Census Tract 209

Census Tract 209		
FEMA Flood Zone	**Total # of Structures**	**Percentage of All At-Risk Structures**
0.2% Annual Chance (500-year)	64	2%
1% Annual Chance (100-year)	130	4%
Floodway	42	1%
Total # of Structures at Risk	236	8%

Table 612: Breakdown of At-Risk Buildings in Census Tract 210

Census Tract 210		
FEMA Flood Zone	**Total # of Structures**	**Percentage of All At-Risk Structures**
0.2% Annual Chance (500-year)	65	2%
1% Annual Chance (100-year)	235	8%
Floodway	65	2%
Total # of Structures at Risk	365	13%

In addition to looking at the CDC/ATSDR data to assess flood risk to socially vulnerable populations, Tazewell County staff and the planning team met with several members of the Blacksburg Street community in North Tazewell during a public meeting (see Section 3: Planning Process). The Blacksburg Street community is a historically Black neighborhood that is located along the Clinch River. In the past, the community was a vibrant, close-knit neighborhood; there were several small homes and a church along the roughly quarter-mile street. Community members voiced that previous and current residents share a great love for the community and are proud to be a part of the neighborhood. Unfortunately, the community is located along a low-lying point bar that has experienced significant flooding over the years. Figure 641 below shows the location of the Blacksburg Street community and highlights some causes of the flooding in the neighborhood.

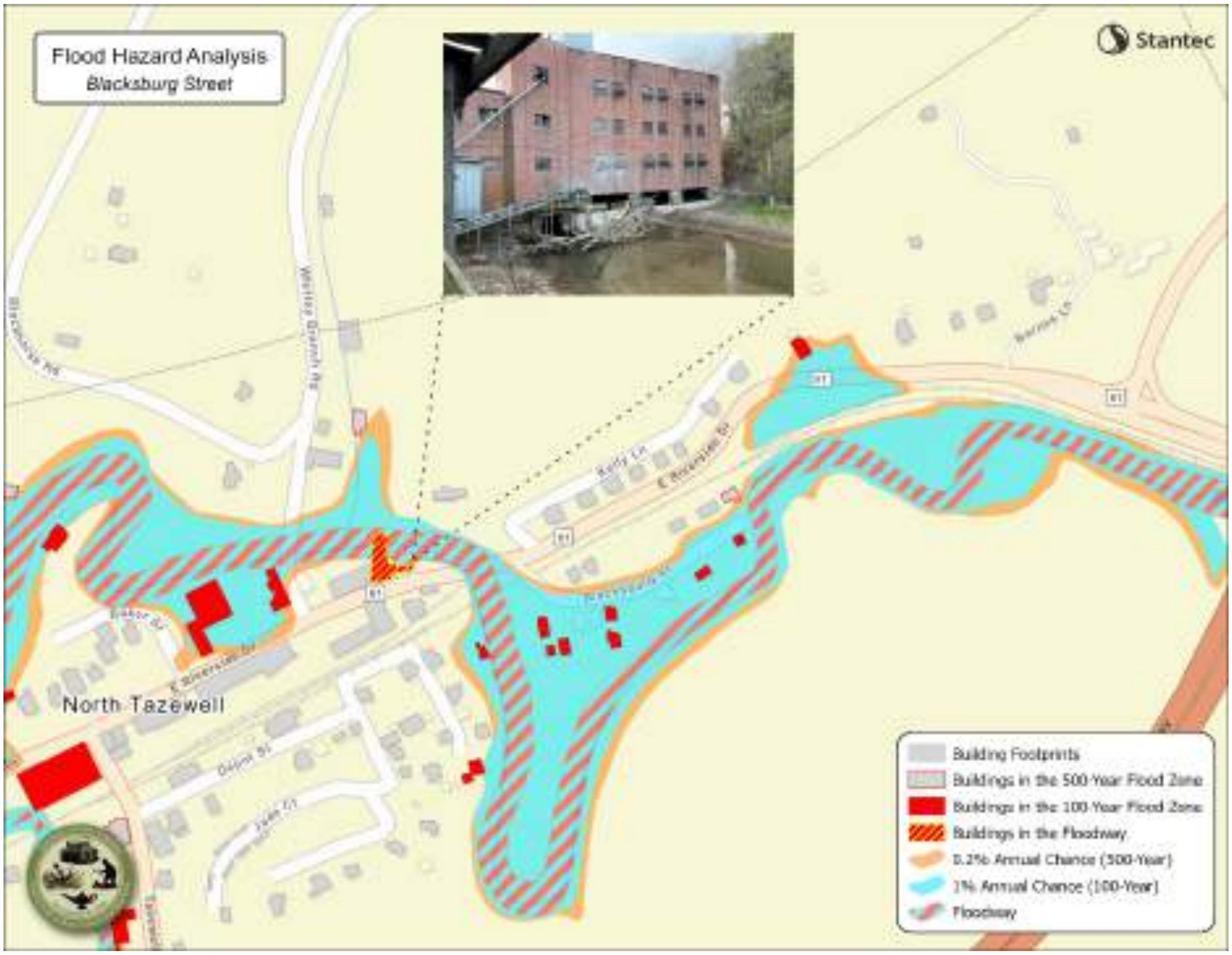


Figure 641: Flood Analysis of Blacksburg Street Neighborhood

Previous flooding events have led to a reduction in the number of homes located in the community. In total there are 12 homes currently located along Blacksburg Street. Seven of the 12 homes are located in the 100-year flood zone, and 1 additional home is located in the 500-year flood zone. In addition to being located in the FEMA flood zones, flooding intensity and/or frequency is potentially increased by the large, abandoned mill building that is located in the floodway downstream. This building, shown in Figure 641, is built in a way that greatly hinders the natural flow of the Clinch River. The water is channeled through a small concrete passageway under the building that was once used to power the mill. Furthermore, the passageway is not large enough to allow large debris to pass underneath the building. This is shown in more detail in Figure 642.

Figure 642: Debris Gathered on Upstream Side of Abandoned Mill Building in North Tazewell

During past flood events, floodwaters have overtopped the bank of the Clinch River at the east end of Blacksburg Street and travelled up the road to the west. This is a regular occurrence and is shown in Figure 643 in a photograph provided by a resident of the community. Flooding impacts all the homes located along the south side of the street. In a public meeting with Blacksburg Street residents, many community members voiced that they have to move their vehicles out of the area when heavy rainfall is predicted and most are concerned that their homes will eventually be severely damaged during a severe flooding event.

Figure 643: Floodwaters on the East End of Blacksburg Street

Flooding Impacts

Given its history of severe flood events and projected future conditions, Tazewell County is susceptible to flooding. Aware of the risk, Tazewell County has adopted a Flood Damage Prevention Ordinance, and participates in several programs aimed at reducing flood risk. These efforts are detailed in *Section 5: Capability and Capacity Assessment*. Despite these steps, Tazewell County remains vulnerable to flooding, as demonstrated through recent events and through results of the flood hazard analysis. Additionally, flooding concerns within the county's watersheds are increasing as the climate changes, as detailed in the *Weather and Climate* subsection.

Floods have a variety of impacts and effect people, structures, and infrastructure in different ways, with both immediate and long-term consequences. Flood impacts to buildings, infrastructure, the economy, public health, and life safety, including impacts on socially vulnerable populations, are described below. Cascading hazard impacts, such as flooding-induced mudflows, are also described.

Buildings

Structures exposed to flooding, including critical facilities, can be severely damaged by floodwaters. Building contents can be lost, damaged, or destroyed, and structures themselves can be compromised by floodwaters. After a flood, wooden structures may rot. Pressure from floodwater, especially as seepage through soil, can damage building foundations. Furthermore, the force of rushing floodwaters can push whole structures off their foundations. Mobile homes and manufactured homes that are not elevated or properly anchored to a permanent foundation are more susceptible to being lifted up and carried hundreds of feet during a flood event, as illustrated in Figure 644. When this occurs, not only is the structure itself damaged or destroyed, but the structure then becomes a threat to other structures, property, and residents as it travels downstream.

Figure 644: Mobile Home that was Destroyed during the July 2022 Flood Event in Bandy, VA[51]

Infrastructure

Infrastructure throughout the county has the potential to be impacted by flooding, including roads, railroads, bridges, dams, electrical systems, and water / wastewater systems. Potential infrastructure impacts are detailed in Table 613 below.

[51] Robert Castillo via WVVA News Bluefield, WV.

Table 613: Infrastructure Flood Impacts

Infrastructure Type	Vulnerability to Flooding
Railroads	Flooding can result in the need to divert trains due to high waters, or even result in train derailments from washed-out tracks. In Tazewell County, railroads often hug streambanks within narrow valleys. No damage to railroads within the county were noted by officials from previous events.
Highways	Floods can wash out roads, causing long-lasting access issues. An example of flood damage on College Road in Bluefield, VA is shown in Figure 645. High, quick-moving floodwaters on highways can sweep up vehicles and pedestrians. Flooding on major roads can interfere with evacuations. Flooding-induced landslides and mud/debris flows can block and damage roads. County officials noted several areas within the county where roadways routinely flood, including Bottom Road, State Road 631 (Indian Creek Road), Allegheny Street, and State Road 102 (South College Avenue). Furthermore, in Tazewell County, precipitation-induced landslides, mudflows, and debris carried down steep slopes by runoff can cause damage to highways, as shown in Figure 646 and Figure 647.
Bridges	Bridges can be washed out or inundated during flood events. In Tazewell County, bridge washouts (both private bridges and state or local bridges) are common during flood events, when quick-moving water rushes through narrow channels. Washed-out bridges can be carried downstream and contribute to debris that blocks channels. Further, bridges that do not fail may be exposed to scouring and become unsafe for future use. Bridges also act as chokepoints during flood events, at which debris carried in floodwaters collects at the bridge and has a damming effect. Tazewell County also has a high number of bridges that are constructed by private property owners; these bridges are less likely to go through the permitting process or meet current design standards.
Dams	Dams are vulnerable to failure during flood events. Failed dams can result in damage to the dam itself, as well as increased flooding downstream. Further, failure at dams that impound hazardous materials, such as slurry or coal ash, may have severe environmental and public health impacts. None of the dams listed within the county are associated with mining; however, there may be small impoundment dams that are not reported.
Electric	Electric systems can be damaged during flood events, causing costly repairs and prolonged service outages. Floodwaters may damage substations and utility poles. In public meetings held near Bluefield, residents brought up concerns about a substation that was being developed in an area that was at risk for flooding. This substation may present an issue in the future.

Infrastructure Type	Vulnerability to Flooding
Water / Wastewater	Water and wastewater systems and facilities have the potential to be impacted by flooding, resulting in costly damages and prolonged service outages. Treatment facilities may become inundated or inaccessible due to floodwaters. Pump stations may become damaged. When roads are washed out, or during landslides, underground watermains and sewage conveyance systems may break. During main breaks, bacteria may be introduced to drinking water systems or low pressure may cause service disruptions. Further, the Town of Richlands Wastewater Treatment Plant (WWTP) has experienced issues with stormwater infiltration and overflows. During heavy precipitation events, stormwater infiltrates the sewer lines, increasing the flow into the Richlands WWTP and leading to untreated wastewater entering the Clinch River.

Figure 645: Road Damage in Bluefield, VA from Flooding in March 2023

Economy

Businesses disrupted by floods often have to close, temporarily and even permanently. They lose their inventories, customers cannot reach them, and employees are often busy protecting or cleaning up their flooded homes. Business can be disrupted regardless of the business being located in the floodplain when customers and clients cannot reach their location, such as when roads are flooded. This is especially true in mountainous areas such as Tazewell County. Like the buildings and homes throughout the county, the county's road network is generally confined to the narrow valley floors along streambanks. Paired with a lack of alternative routes, a flooding event will isolate individuals, neighborhoods, or entire communities in the county.

Business interruption means forgone sales tax revenue for the county. As with flooded roads, public expenditures on flood preparation, response, and recovery, including sandbags, public works, emergency calls, debris clean-up, and repairs to damaged public property affect all residents of the county, not just those in the floodplain. Further, some residents may choose to leave the county after their homes have been flooded; it was noted as both public meetings that residents who relocated after being impacted by floods did not move back. Emigration of residents can impact property values, businesses, and tax revenues for the county.

Public Health Impacts

Floodwaters often contain contaminants such as bacteria and chemicals. Flooding may cause combined sewer overflows, resulting in sewage in floodwaters. Individuals traversing floodwaters or children playing in floodwaters could contract diseases, injuries, and infections.

Structures exposed to floodwaters can also present public health hazards. Damaged electrical systems and natural gas tanks present risk of fire and explosions. Structures exposed to flooding may develop mold or wood rot. People with asthma, allergies, or breathing conditions may be at a higher risk to mold.[52]

Trains or trucks carrying hazardous materials during flood events have the potential to spill or release hazardous materials due to crashes or derailments, which could negatively impact public health. Fixed sites, such as factories or industrial facilities, can also release hazardous materials when their facilities flood.

Life Safety

The public often underestimates the dangers presented by floodwaters. Flooding is often localized to certain parts of a community (e.g., certain roads, intersections, or neighborhoods), and floodwaters can prevent normal access to buildings and facilities. This presents a danger when motorists and pedestrians attempt to traverse floodwaters. Motor vehicles and pedestrians can get swept up in flood currents, increasing the risk for drowning. Even in shallow waters, fast-moving currents can carry individuals or vehicles into deeper waters, where pressure from flowing water can prevent drivers from escaping submerged vehicles. As little as six inches of floodwater can move a vehicle, and as little as two inches can move a person. In addition, floodwaters often conceal conditions that are a danger to those on foot, including electrical wires, debris, nails, and open manholes hidden beneath the surface. In addition, roads and bridges can be weakened by flood impacts, making them unsafe for travel. Flood conditions necessitate warnings, such as flash flood warnings, road closure warnings, and flood advisories. Evacuations may be necessary, as was the case in both the 2020 and 2022 events in the county. Moving vehicles in advance of predicted heavy rainfall events was mentioned in a few of the public meetings.

52 The Centers for Disease Control and Prevention. (2020). Mold after a disaster. Retrieved April 11, 2023 from https://www.cdc.gov/disasters/mold/.

Although, this mitigates the risk of flood damage to the vehicles, it does highlight some concerns with public education and/or notification methods used to ensure residents evacuate when necessary.

Socially Vulnerable Populations

Floods have the potential to disproportionately impact socially vulnerable populations. Economically constrained households (homeowners and renters) may have trouble affording flood insurance premiums. In the event of a flood, these households have a diminished capacity to repair homes, remediate mold, and replace destroyed belongings. Further, economically constrained households may not be able to afford mitigative measures, such as structure elevation, backwater check valves or sump pumps. Individuals that do not have paid time off or are unable to work remotely (such as those in food service and hospitality) may attempt to traverse floodwaters to commute or may lose income in the event they cannot report to work due to a flood.

Certain populations may face difficulty evacuating during an extreme flood event, such as the elderly, disabled, or those who are otherwise mobility challenged. This may be particularly relevant to Tazewell County due to an aging population; approximately 22% of the county's population is 65 years or older, compared to 16% for the Commonwealth of Virginia.[53] Non-English speakers may also have difficulty understanding flood warnings and evacuation notices.

During public meetings, it was noted that several older individuals within the Blacksburg Street community were very concerned with the how quickly floodwaters can surround their neighborhood. Due to the location of the community and other contributing factors, the area is provided minimal warning when flooding events will occur. Some residents would require assistance from neighbors or family to safely evacuate. Many of the residents are fearful of a flooding event occurring at night and not being able to evacuate or get help evacuating before being stranded in their home.

Cascading Hazards

Flood events may lead to cascading hazards, or events where a primary hazard, such as extreme precipitation or flooding, results in subsequent hazard events. Extreme precipitation and flooding are known to trigger landslides, mudslides, and debris flows in Tazewell County. During a rainfall event, water fills the small pockets of air that naturally occur within soil, increasing the potential for a landslide. During a flooding event, flood waters can erode and, eventually, can undercut the base of the slope, carrying away a section of earth. With a portion of the slope base removed, the strength of the entire slope is now compromised, leaving it far more susceptible to a landslide.

As recently as February 2023 heavy rainfall led to a landslide event in southwestern Tazewell County. The incident, shown in Figure 646 and Figure 647, occurred near Tannersville, VA and caused State Route 91 to be reduced to one lane. The landslide caused significant damage to the roadway and no timeframe for getting the repairs completed was provided.

[53] United States Census Bureau. (2021). Tazewell County, Virginia. US Department of Commerce. Retrieved on March 10, from [Tazewell County, Virginia - Census Bureau Profile]

Figure 646: Landslide Event on Route 91, near Tannersville, VA

Figure 647: Damage from Landslide Event on Route 91

Furthermore, slopes with little or no vegetation as a result of mining operations, development, or a previous wildfire have elevated risk of landslides or mudslides.[54] Lands impacted by abandoned mines may also be more prone to slides.

Flood events may also lead to hazardous materials releases, when facilities containing hazardous materials, such as water/wastewater treatment facilities or industrial facilities, flood. This can cause

[54] Cumberland Plateau Planning District Commission. (2018). Hazard Mitigation Plan Update. Retrieved October 10, 2022 from http://cppdc.org/Reports/Mitigation%20Plan%20Edit.pdf.

environmental and public health emergencies, necessitating response, clean up, and/or evacuation measures.

Areas Prioritized for Risk Reduction

At the outset of this project, 12 initial flooding hotspots were identified as areas that had historically experienced severe flooding in the past. These initial hotspots guided planning team discussions and served as a starting point for the identifying problem areas throughout the county. These initial flooding hotspots are shown in Figure 648.

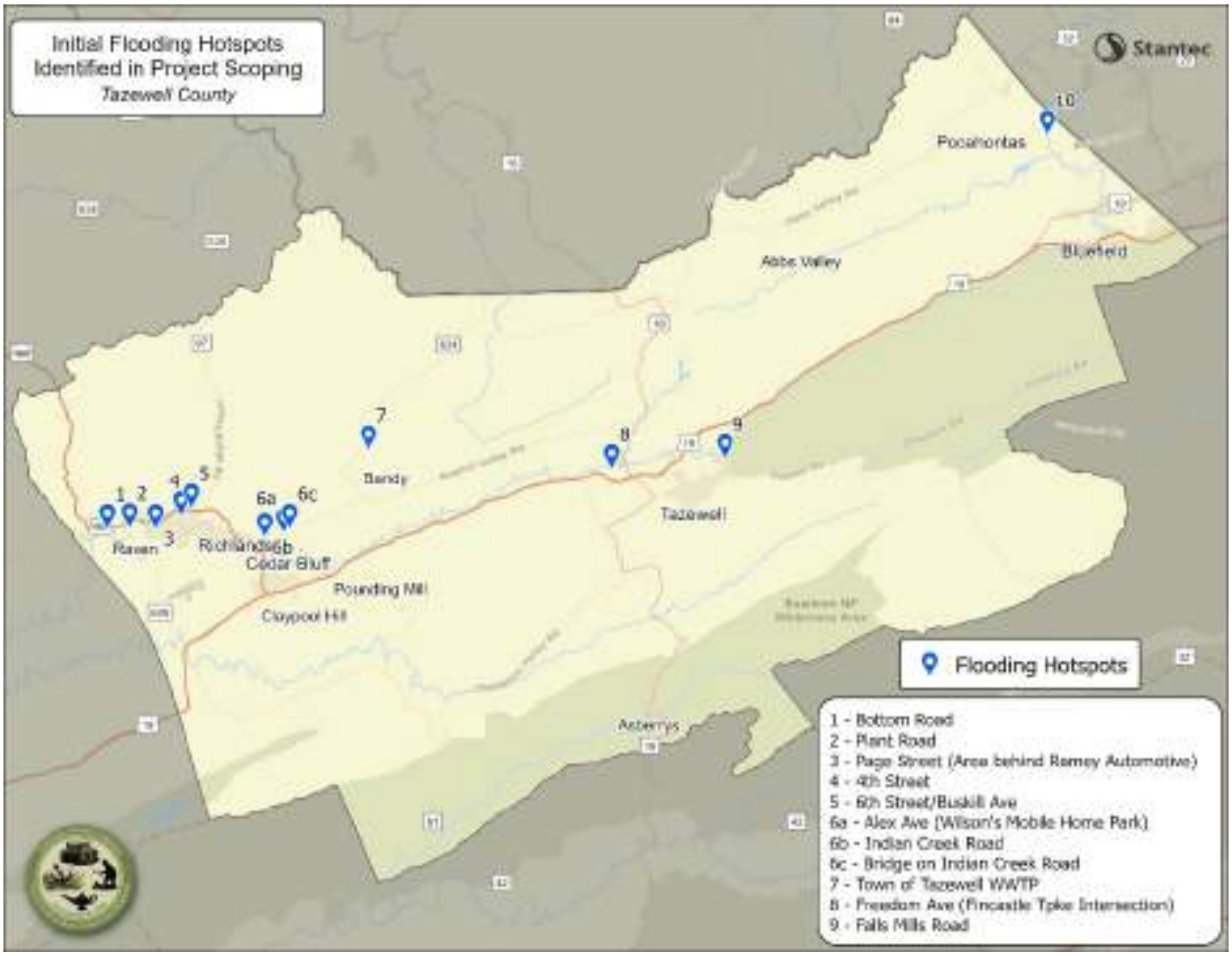


Figure 648: Initial Flooding Hotspots Identified in Project Scoping

Throughout the development of this risk assessment, the project planning team met several times to discuss flooding in locations across the county. The project planning team consisted of Tazewell County staff members from the Emergency Management and Engineering Departments and members of the Tazewell County Board of Supervisors, as well as members from municipalities throughout the county including the Town of Richlands, Town of Tazewell, and the Town of Bluefield. Project planning team members provided decades of experience and first-hand accounts flooding issues in Tazewell County.

In addition to conducting planning team meetings, 3 public meetings were held during the development of this Risk Assessment. The date and locations are listed here:

1. Town of Richlands Public Meeting, February 28, 2023
2. Town of Tazewell Public Meeting, March 23, 2023
3. Town of Bluefield Public Meeting, May 2, 2023

At each of these public meetings, the project planning team met with members of the public to discuss their concerns and collect information and data on previous flooding events. This included collecting more flooding hotspot information from members of the public, both to verify the 12 initial flooding hotspots identified but also to ensure the concerns of the public were considered when considering areas at risk and where to prioritize future risk reduction projects. In total, 86 flooding hotspots were identified throughout the development of the plan. A breakdown of each source is provided below in Table 614. The majority of these hotspots are located along the Clinch River from Raven to Cedar Bluff, near North Tazewell, in or near Bluefield, and in the Falls Mill area. The locations of the identified flooding hotspots are shown in Figure 649 – Figure 652.

Table 614: Identified Flooding Hotspots by Source

Flooding Hotspot Source	Total Number of Hotspots Identified
Initial Project Documentation	12
Planning Meetings / Planning Team	28
Public Meetings	46
Total	**86**

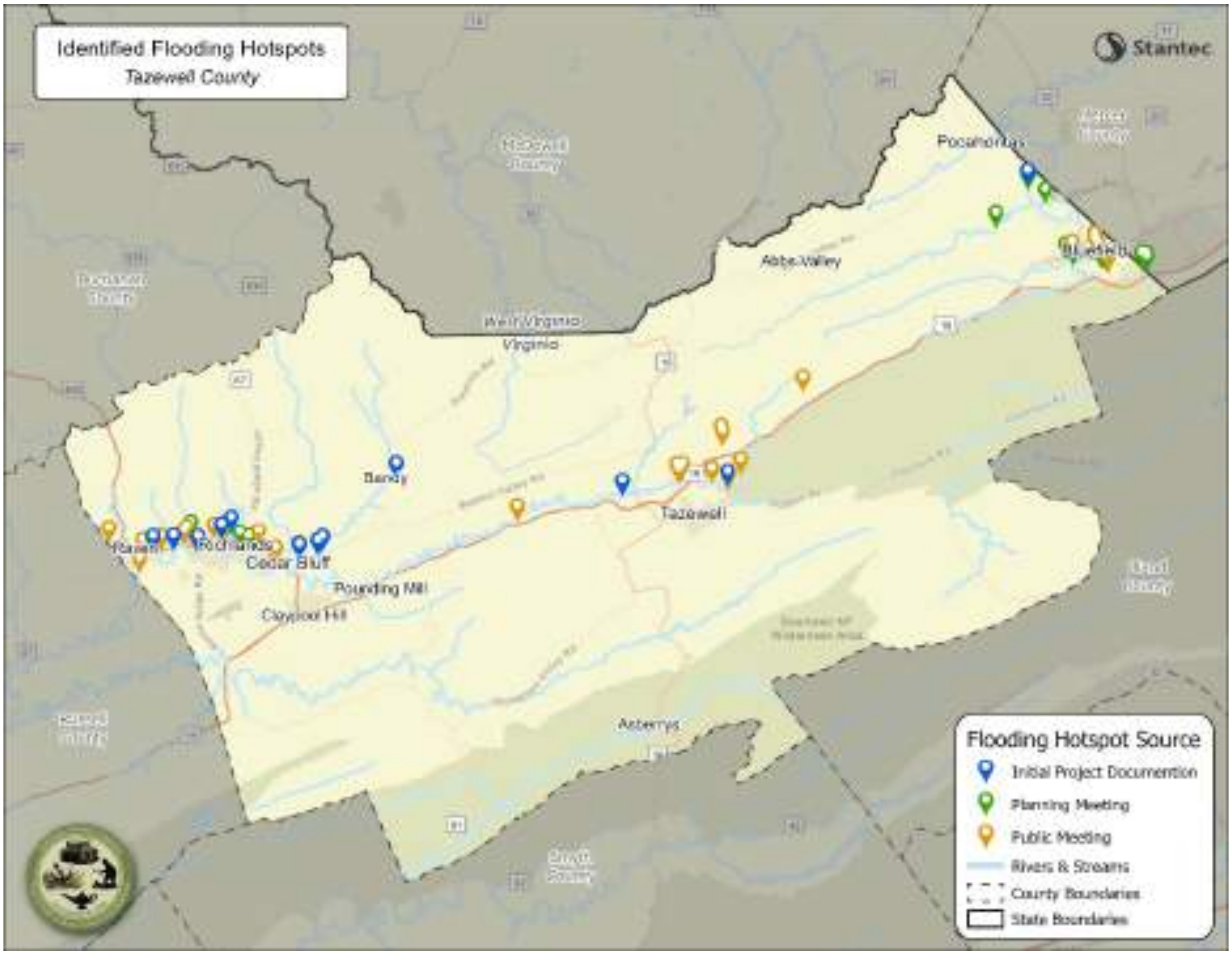


Figure 649: Identified Flooding Hotspots in Tazewell County by Source

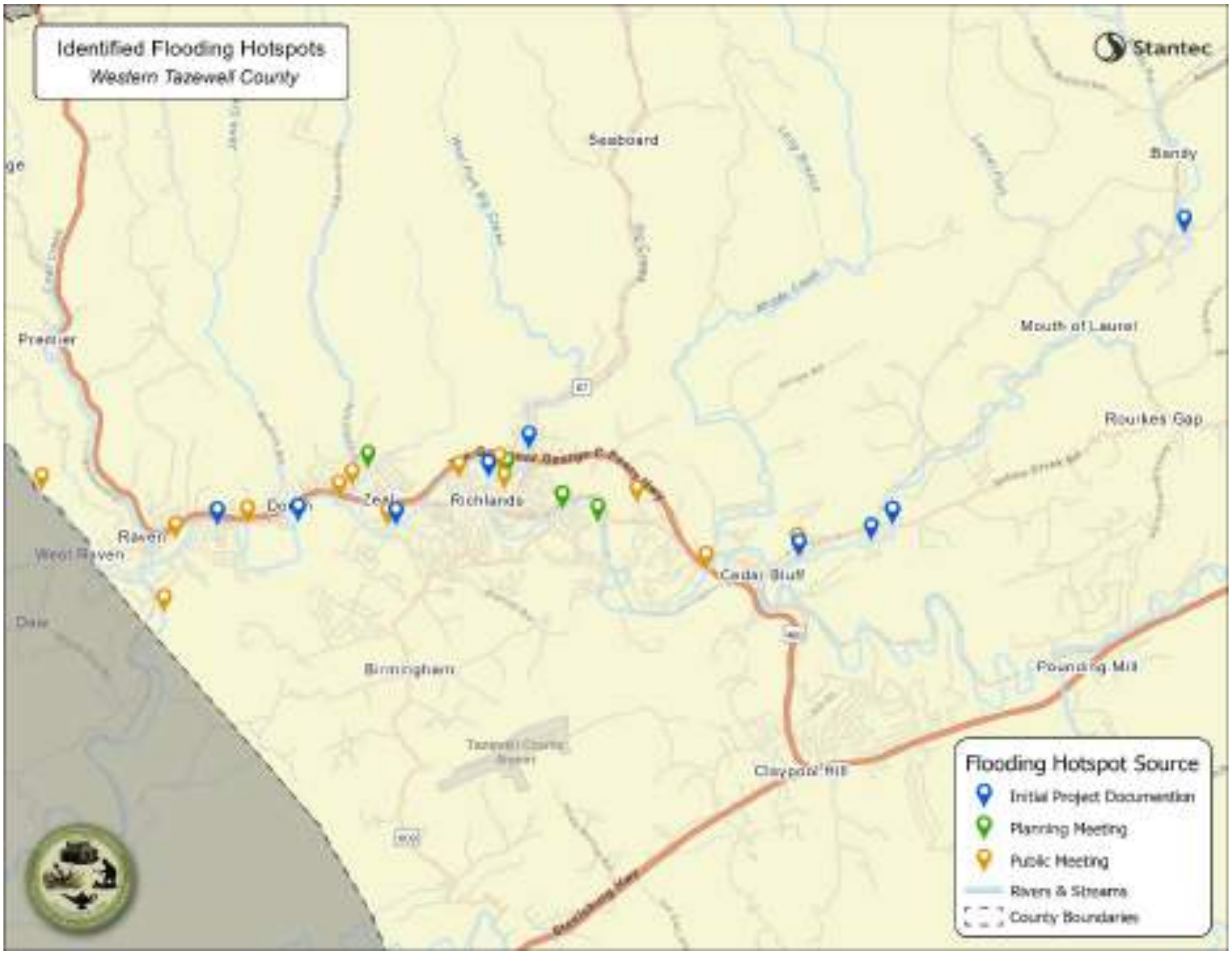


Figure 650: Identified Flooding Hotspots - Western Tazewell County

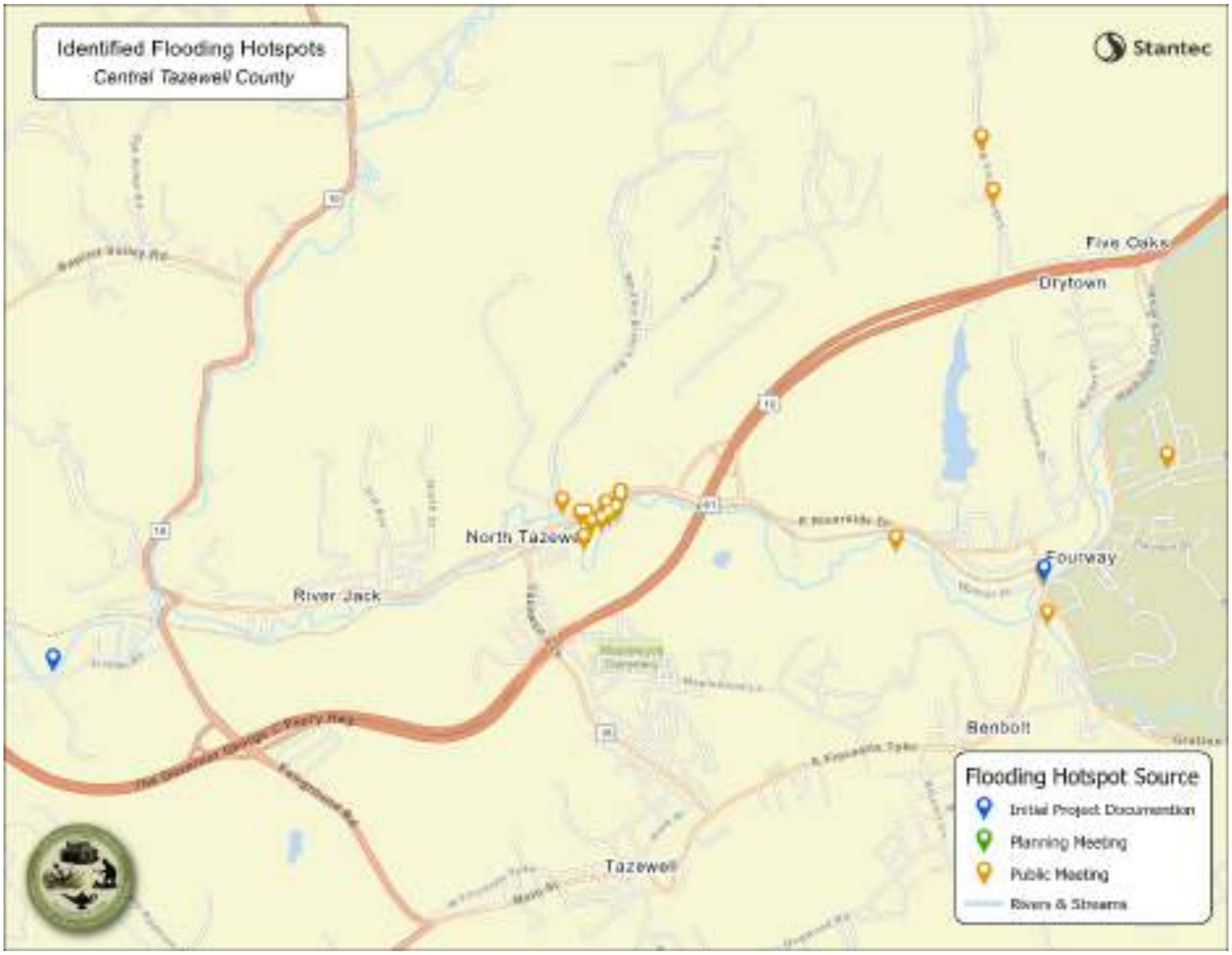


Figure 651: Identified Flooding Hotspots - Central Tazewell County

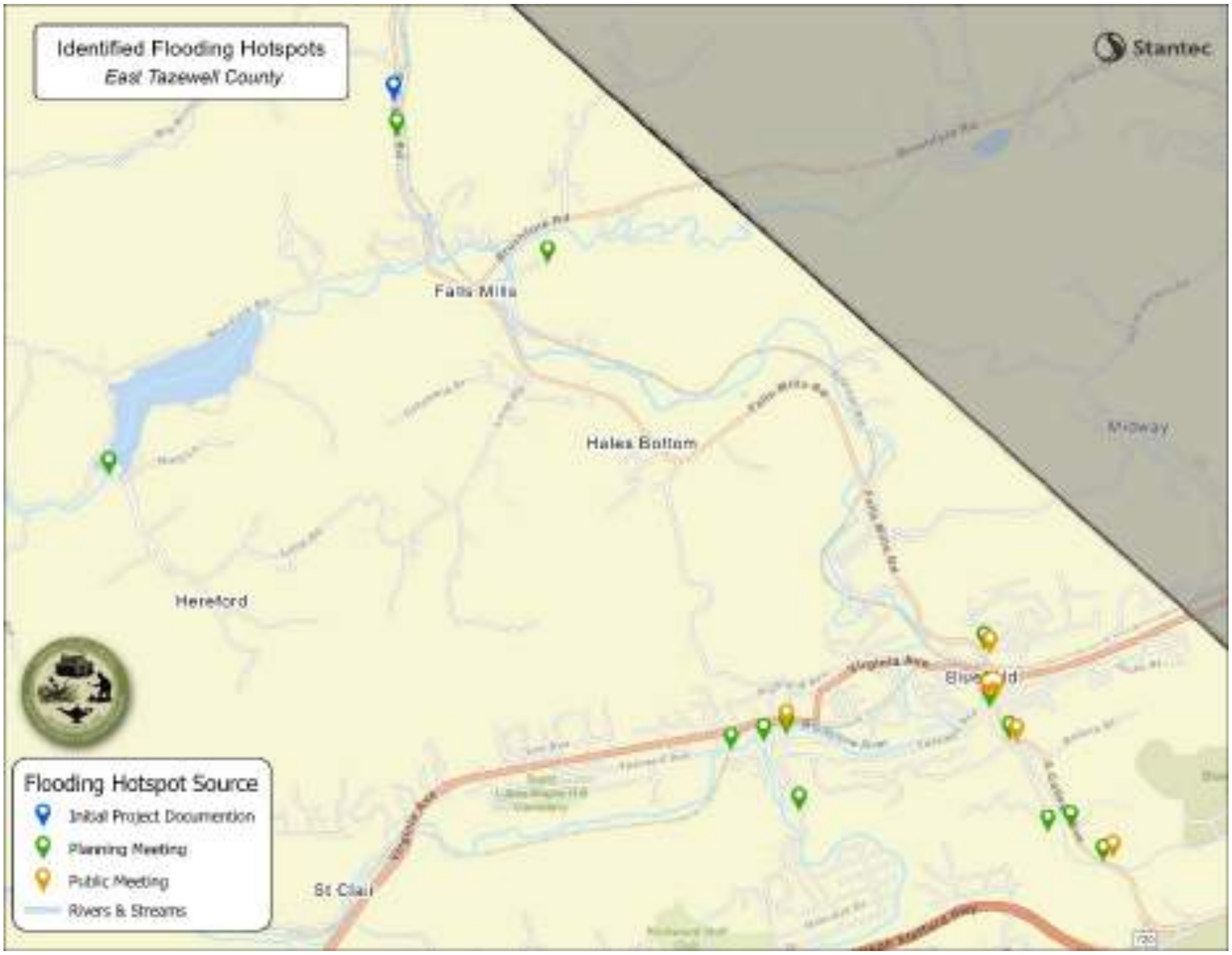


Figure 652: Identified Flooding Hotspots - Eastern Tazewell County

It is acknowledged that most developed areas of Tazewell County, especially low-lying areas adjacent to stream channels, are at risk to flooding. Areas that have not previously been impacted by a major event may be impacted in the future. However, a number of prioritized actions were identified in order to support implementation of risk reduction projects. The results of the flood hazard analysis and the impacts of flooding outlined above informed the flood risk reduction actions presented in *Section 7: Flood Risk Reduction Action Plan*. Areas prioritized for risk reduction were identified based on previous flood events, results from the flood hazard analysis, and input from the Tazewell County Planning Team and the public.

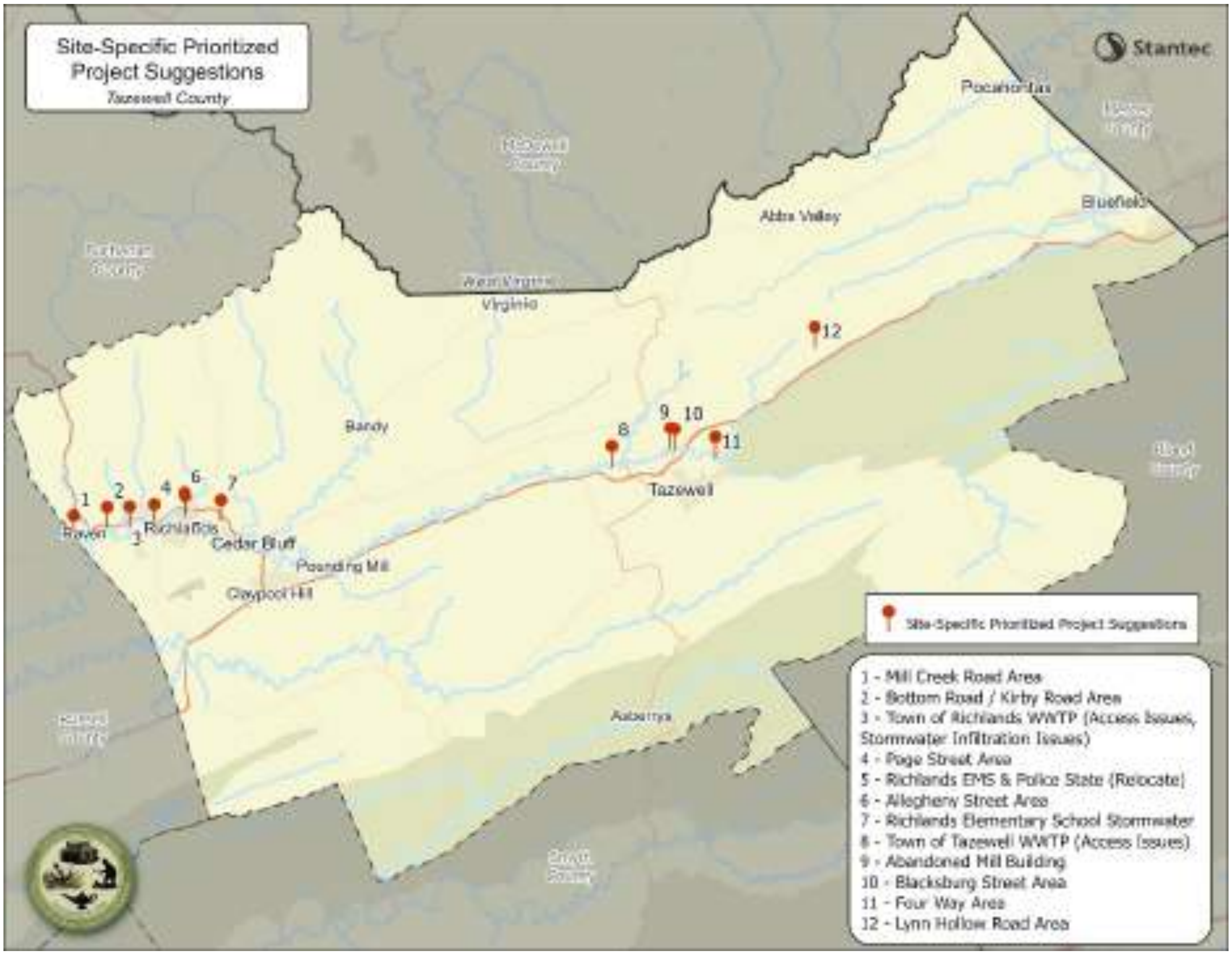
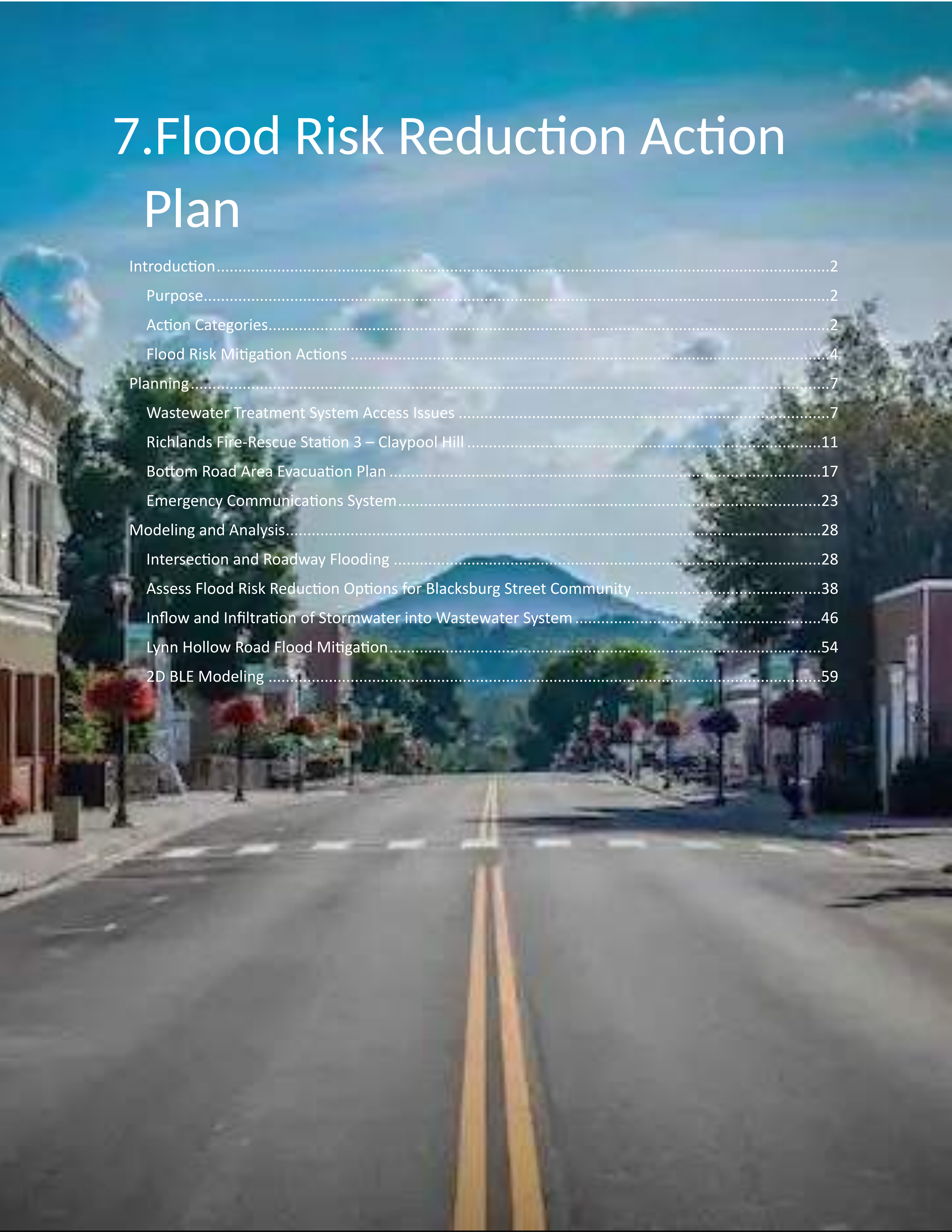


Figure 653: Site-Specific Prioritized Project Suggestions



7.Flood Risk Reduction Action Plan

Introduction

Purpose

The Flood Risk Reduction Action Plan is a product of the input and analyses completed during the planning process. It is developed from stakeholder input, risk analysis, and capability and capacity assessment results, and is intended to guide the county in implementing actions to risk current and future flood risk. The purpose of the Flood Risk Reduction Action Plan is to provide Tazewell County with strategies to reduce the impact of flood hazards. It is designed to be targeted, strategic, and functional in nature:

- In being **targeted**, the action plan focuses on actions the County can take to reduce unique flood risks identified in the plan's risk assessment (Section 6) with consideration to the County's capabilities and capacity (Section 5) and previous or ongoing flood mitigation efforts.

- In being **strategic**, the action plan ensures that the actions are presented in a logical manner. Actions are designed to build off the capabilities gained by achieving a prior action. This structure aims to minimize potential roadblocks and improve the potential for successful implementation.
- In being **functional**, each prioritized action, when possible, is broken down into implementable steps. When available, funding sources are identified that may assist in project implementation.

Developing the Flood Risk Reduction Action Plan involves the identification, consideration, and analysis of available flood mitigation measures (i.e., activities, policies, projects, etc.) that will reduce flood risk within Tazewell County.

Action Categories

The flood risk mitigation actions represent a variety of projects that can be implemented to reduce flood risk for Tazewell County. The actions can vary including programs, infrastructure, public education, policies, emergency planning, and studies.

When implementing infrastructure projects, there is typically a project lifecycle that is followed from the identification of the problem to the implementation of the project intended to address the problem. First, the **problem is identified** in a community. Next, the **planning** phase is taken on to understand the scope of the problem, identify preliminary solutions, identify stakeholders for engagement, and start procuring funding. After the planning phase, further studies are often needed to understand the potential impacts of the proposed solutions such as flood **modeling** or further **analysis** by an engineer. This step in the lifecycle is key to understanding whether identified solutions are expected to have the desired impact, and to understand potential unintended consequences of projects aimed at reducing risk. For larger projects, a **feasibility** study may need to be completed to confirm the conditions are correct for the implementation of the solution. Often, this is when project alternatives may be studied and compared, or when a project benefit-cost analysis is performed. Once the further analysis or a feasibility study confirms a preferred solution, an engineer can **design** the solution and obtain necessary permits to implement the solution. Following the design phase, a contractor can be hired to **construct** and implement the solution. Finally, the solution will need to be **maintained** and **monitored** to ensure it is functioning at full capacity and is solving the identified problem. The project lifecycle is shown in **Figure 71**.

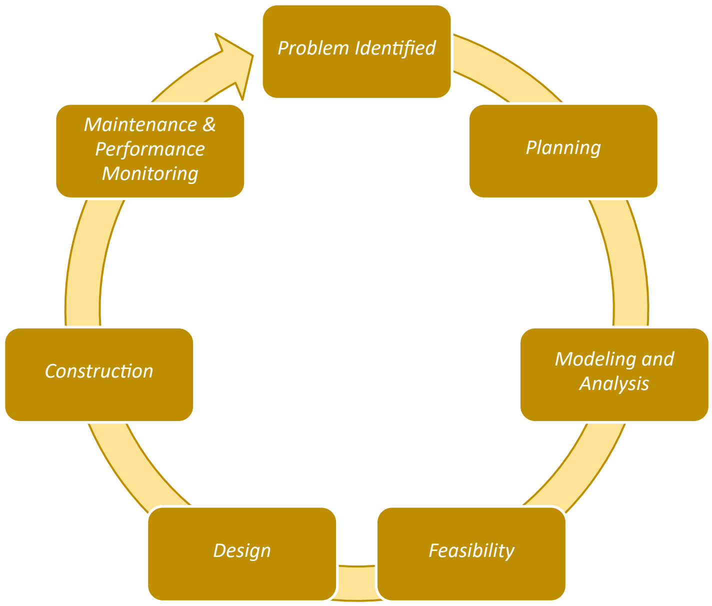


Figure 71: Infrastructure Project Lifecycle

Throughout the planning process, flood risk mitigation actions were identified to reduce flood risk in Tazewell County. The actions are broken into four categories depending on the current progression of the action through the project lifecycle. Each action is intended to go through the entire project lifecycle to reach implementation; however, some require more initial planning and modeling/analysis to better guide implementation. Planning and modeling/analysis help inform implementation by ensuring the correct problem is being solved, the solution is feasible, and the selected solution will have the anticipated benefits. Some actions are needed on an ongoing basis or at many locations throughout the County. These actions have been summarized into programmatic actions to expedite the project lifecycle for each implementation and/or provide the administrative support needed to implement flood mitigation actions. The four categories are described in **Figure 72**.

Planning

- Flood Risk Mitigation Actions where a problem has been identified, but further planning efforts are needed to recommend the analysis to identify possible solutions.

Modeling and Analysis

- Flood Risk Mitigation Actions where the problem has been identified and likely sources have been identified through a planning phase. Specific models and analysis are recommended to test and select an alternative for implementation.

Confirm Feasibility, Design, and Implement

- Flood Risk Mitigation Actions where a preliminary solution has been identified. Studies will be needed to confirm the solution and move into design.

Programmatic

- Flood Risk Mitigation Actions that are needed throughout the County in several areas. These have been developed into programs for the County to apply on a large, reoccurring basis. Actions based in public outreach/ education or those that are regulatory and policy-based fall into this category.

Figure 72: Flood Risk Mitigation Action Categories

Flood Risk Mitigation Actions

Overall, 16 Flood Risk Mitigation Actions were identified for Tazewell County. The actions are summarized by category in **Table 71**.

Table 71: Tazewell County Flood Risk Mitigation Actions

Category	#	Flood Mitigation Action	Priority Actions
Planning	1	Wastewater Treatment System Access Issues	-
	2	Richlands Fire-Rescue Station 3 – Claypool Hill	-
	3	Bottom Road Area Evacuation Plan	Yes
	4	Emergency Communications System	-
Modeling and Analysis	5	Intersection and Roadway Flooding	-
	6	Assess Flood Risk Reduction Options for Blacksburg Street Community	Yes
	7	Inflow and Infiltration of Stormwater into Wastewater System	-
	8	Lynn Hollow Road Flood Mitigation	-
	9	2D BLE Modeling	Yes
Confirm Feasibility, Design, and Implement	10	Removal of Abandoned Mill Building and Associated Dam	Yes
	11	Richlands EMS and Police Station Relocation	Yes
	12	Richlands Elementary School Stormwater	Yes
Programmatic Actions	13	Beaver Management Program	-
	14	Routine Debris and Sediment Removal Program	Yes
	15	Develop Emergency Debris Management Program	Yes
	16	Acquire Undeveloped Parcels	-
	17	Acquire Developed Parcels	-
	18	Participate in Community Rating System (CRS)	-

In the following sections, each action is described in detail including a:

- problem description;
- project lead;
- action description;
- steps for implementation; and,
- potential funding sources.

Several actions were designated as priority actions which should be implemented as soon as possible. Priority actions were selected based on feedback from the community, potential for risk reduction, protection of critical facilities, life safety, and equity. When possible, an estimated time to complete and estimated costs were provided. **All costs provided in this plan are high level planning**

cost estimates. Costs were estimated based on the previous experience of subject matter experts; however, costs are likely to change depending on each unique scenario. Throughout the project lifecycle, costs should be verified with an engineer to ensure proper funding is obtained. Potential funding sources are described in further detail in **Appendix A – Funding Matrix**. It should be noted that grants often change requirements, funding cycles, and processes. All grant information should be verified with the provider before pursuing the grant. Additionally, new grants are frequently announced. The County should continue to look for grants outside of the opportunities included in this plan for flood risk mitigation.

Planning

Two Flood Risk Mitigation Actions have been identified in the Planning Category. These actions have problems that have been identified but require additional planning activities to better understand the scope of the problem, community goals, and possible solutions for further study. Identified costs, estimated time to complete, and funding sources are very high level given these actions being early in the project lifecycle.

Wastewater Treatment System Access Issues

Problem Description

The access points to both the Town of Richlands Wastewater Treatment Plant (WWTP) and the Town of Tazewell WWTP are within flood hazard areas (floodway and 1% annual chance). The planning team has noted during flooding events that staff cannot reach the WWTPs. During the 2020 floods, Richlands WWTP staff used boats to access the WWTP. The road leading to the bridge to access the Tazewell WWTP also floods, preventing access. The County reports that the WWTPs do not get flooded, but access is fully blocked. The Richlands WWTP Plant has a levee surrounding the plant. The WWTPs are shown in **Figure 73** and **Figure 74**.

Figures of Problem Area

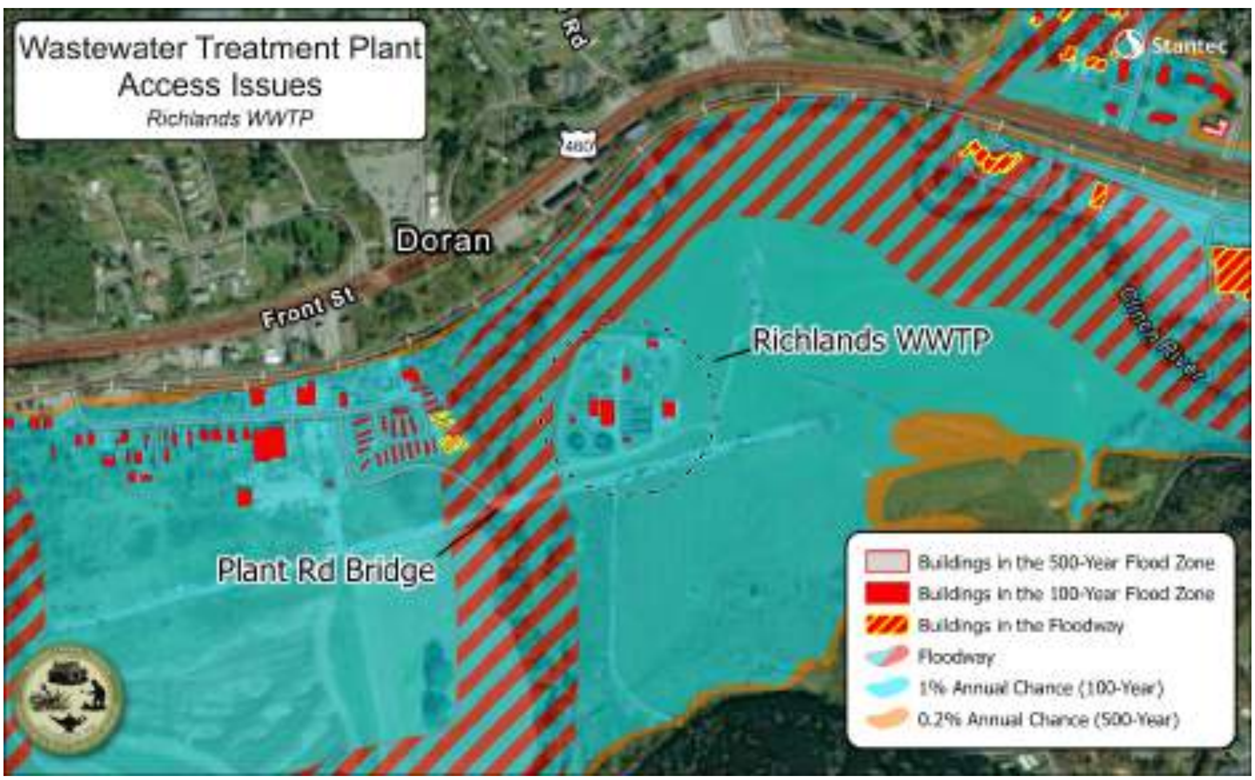


Figure 73: Richlands Wastewater Treatment Plant

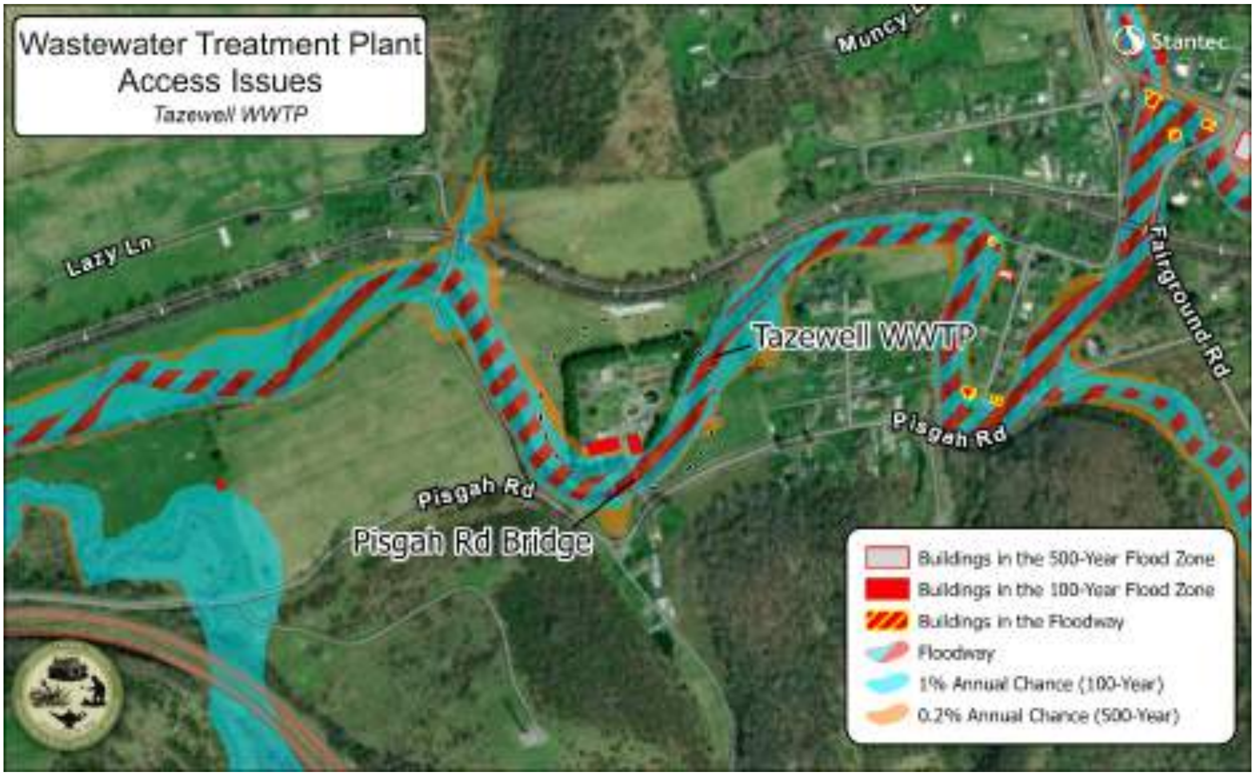


Figure 74: Tazewell Wastewater Treatment Plant

Project Type
Planning

Total Estimated Cost
Dependent on the Selected Solution

Estimated Time to Complete
5+ years

Project Lead
Town of Richlands, Town of Tazewell

Action Description
Access to the Richlands WWTP and Tazewell WWTP is a complex issue given the location of the WWTPs along the river. A series of actions will be needed to help improve access in the near term, mid-range, and long term. The U.S. Army Corps of Engineers is performing some flood modeling and surveying in Richlands. Mitigation efforts for the Richlands WWTP should utilize the modeling and survey from the U.S. Army Corps of Engineers for reference. In the near term, steps should be taken to minimize the need for personnel on site during flood events. When staff must be on site, there should be clear safety protocols.

The mid-range goal is to perform additional analysis for projects to improve access through actions such as raising roads and constructing bridges. Projects should be implemented based on the results of the analysis and a Benefit Cost Analysis (BCA) compared to relocation. A Base Level Engineering (BLE) with

2D hydrology model coupled with a stormwater infrastructure hydraulic model may be beneficial to understand the flooding and see the impacts of proposed solutions.

The long-term goal to minimize risk is to relocate the plants. While relocation may be a difficult task, when making investments in the plants and as technology progresses it should be considered. Studies may need to be performed when upgrading the plants to understand the value of investing in plants within high-risk areas or relocating the plants outside of flood hazard areas. Studies will need to be performed such as a hydraulic model to understand the implications of moving the site and a study to identify the best location for the WWTP. At their current locations, both plants are gravity-based systems. Relocating the plants will likely involve installing pumps to maintain the plants at higher elevations. These projects may be grouped together or pursued separately by each Town and/or by solution. As the long-term options are pursued, another option for project delivery is Design-Build-Operate (DBO). With DBO, there is a public-private partnership where the private entity designs, constructs, and operates the facility while the municipality retains ownership. The benefits include reduced capital and maintenance cost, more advanced equipment, shortened delivery schedules, performance guarantees, and less contracting. [1]

[1] "Design-Build-Operate Gains Populatiry in U.S. Market", Water World, Design-Build-Operate Gains Popularity in U.S. Market | WaterWorld

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By
1	**Study Plant Operations -** In the **near term**, operations should be studied to improve access to both plants. Town Staff should engage WWTP operators and staff. If the Richlands WWTP plant is going to continue to use boats to access the plant during flooding, procedures should be formalized to ensure the safety of staff. Operating tools such as SCADA with backup power should be reviewed to minimize the need for staff to be at the plant during floods. Additionally, safety	0-5 years	Town Staff Time	• Town Operating Funds • CFPF
2	**Access Improvements -** The **mid-range** goal is to perform additional analysis on access improvements to both plants and implement if warranted. For the Richlands WWTP, alternatives could include a bridge across Governor George C. Peery Highway to the northside of the treatment plant or raising sections of Route 613, Plant Road, and Clinch River Road. For the Tazewell WWTP, alternatives could include raising the bridge or providing a secondary access on the northside of the plant. For both plants. the analysis should include a BCA and include considerations for railroad permitting, environmental permitting, and changing climate conditions. Throughout this process,	5-15 years	Dependent on Selected Solution	• Area Development Program • Local Access Road Program • PROTECT • CFPF • BRIC • HMGP
3	**Facility Relocation -** A **long-term** goal could explore the relocation of one or both facilities as they age out and reach the end of their lifecycles. For the Richlands WWTP, the entire facility and most of the access roads are within the 100-year floodplain. For the Tazewell WWTP, the access bridge is aging, and parts of the treatment plant lie within flood hazard areas. As flows are projected to increase, flooding will also likely increase. Over time, flood impacts to the WWTPs should be documented to aid in decision-making in terms of facility upgrades and/or potential relocation. As equipment ages towards replacement, the Town should study and consider options for relocation. BCA's can be performed to assist with the decision-making process. Studies will need to be performed such as a	15 + years		• Area Development Program • CFPF • BRIC • WIFIA Loan • CBDG • VCWRLF • HMGP

Funding Sources

See Table

Figure of Action

N/A

Richlands Fire-Rescue Station 3 – Claypool Hill

Problem Description

The County reports that the Richlands Fire-Rescue Station 3 on Honey Rock Road floods frequently from stormwater. The County believes there are several causes of the flooding including landowners piping water off their properties onto the road and undersized drainage pipes in the area. The County notes that most stormwater pipes are eight to twelve inches underneath the road and that they exceed capacity. The road slopes towards the fire department, and so does the excess stormwater. In addition, Honey Rock Road sits in a valley with stormwater runoff flowing from the surrounding higher elevations. The area includes several businesses and a cemetery which increase the amount of impermeable surface. The front of the fire station is shown in **Figure 75**, its location is shown in **Figure 76,** and the surrounding terrain is shown in **Figure 77**.

Figures of Problem Area

Figure 75: Richlands Fire-Rescue Station 3

Figure 76: Fire station location

Figure 77: Terrain surrounding Honeyrock Road

Project Type
Planning

Total Estimated Cost
Dependent on Solution

Estimated Time to Complete
1 - 3 years

Project Lead
Town of Richlands

Action Description
Additional planning and preliminary engineering activities are needed to better understand the cause of the flooding issues before investing in potential solutions. Based on the results of the additional planning and preliminary engineering, the Town can select solutions to move towards implementation. Potential solutions may involve stormwater infrastructure improvements, policy changes and enforcement, acquisition, or retention. For example, stormwater being pumped from properties onto the roadway may be in violation of local ordinances. Depending on the existing stormwater infrastructure along Honeyrock Road, installing retention-based solutions or increasing capacity may be expensive due to stormwater modeling, alternative selection, design, property acquisition, and construction. The most cost-effective solution may be the relocation of the fire station.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Baseline and Initial Conditions Review –** Hire a consultant engineer to perform an initial assessment of the flooding issues and provide all available information about the infrastructure in the area including: as-builts of any stormwater infrastructure, as-builts of the fire station, photos from previous events, and existing hydraulic models of the area. The engineer will review the existing data, perform a site visit to provide an initial assessment of the	2 months	Dependent on Selected Solution	County Operating Funds
2	**Pursue Funding –** Based on the engineer's recommendations, the next step is for the Town to pursue funds for further study, policy development, policy enforcement, additional data collection, or relocation. If a stormwater-based solution is selected, the County should			
3	**Preliminary Hydrologic Study** - A stormwater engineer will perform a preliminary hydrologic study to identify a target reduction volume for the improvements. For the study, additional surveys and/or soil assessments may be	1 - 2 months		• SLAF • CFPF
4	**Alternative Review** - Based on the identified target reduction volume and flow study, a stormwater engineer will identify three alternatives to reach the target reduction volume. The engineer will assess the viability of each option and provide a comparison of the	2 months		
5	**Design** - After a preferred alternative is selected, the stormwater engineer will design the identified solution. Additional surveys or data may be needed to complete the design. Completed plans will allow the responsible	3-4 months		
6	**Permitting** – Depending on the solution selected, permits may be required to construct the stormwater improvements. These may include, but are not limited to environmental permits, land disturbance permits, and land use permits. There may be fees associated with the	6 months		
7	**Construction** - The selected contractor will build the selected solution based on the design.	1-2 years		

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
8	**Maintenance** - Depending on the selected and constructed solution, routine maintenance may be needed. A maintenance plan should be made including maintenance frequency, actions	Annually		

Funding Sources

See table

Figure of Action

N/A

Bottom Road Area Evacuation Plan

Priority Action

Problem Description

The Bottom Road Area in Raven/Doran has been one of the areas most impacted in Tazewell County by recent floods. During the 2020 floods, both homes and infrastructure were impacted by flooding. Bottom Road is shown in **Figure 78**. The area is a peninsula surrounded by the Clinch River and is one of the more densely populated areas in the County given its flat topography. Within the area, there are a large number of residents living in proximity to the river or within the floodplain. The main access point to the area is a VDOT bridge across the Clinch River on Bottom Road that is subjected to frequent flooding. During the 2020 floods, the National Guard performed rescues in the area, as shown in **Figure 79**. Following the 2020 floods, VDOT rehabilitated the bridge due to concerns of the bridge washing out. Additionally, Raven Road flooded during 2020 which is the road used to access the bridge as shown in **Figure 710**. When the bridge is not accessible, the only other access points to the area are an unpaved road or Daw Road, which is a narrow two-lane road approximately twice the distance to Richlands. While there are flood risk mitigation actions proposed to help minimize flooding in the area, there is also a need for an evacuation plan given the number of flooding issues, high population in the area, and access issues.

Figures of Problem Area

Figure 78: Bottom Road/ Kirby Road during the February 6, 2020 flood (Source: Donna Whittington)

Figure 79: National Guard during 2020 floods (Source: Donna Whittington)

Figure 710: Raven Road during 2020 Floods (Source: Donna Whittington)

Project Type
Planning

Total Estimated Cost
$50,000 - $150,000

Estimated Time to Complete
0 – 1 year

Project Lead
Tazewell County

Action Description
While long-term solutions are identified in the Bottom Road Area, emergency procedures need to be in place to minimize flood risk given the large number residents isolated in the area. An evacuation plan should be developed to communicate flood risk to residents, relocate residents to a safe location, and identify potential access points during flood events. Given the history of flooding of the roads leading to the Bottom Road Area, residents should be encouraged to evacuate prior to a flooding event. **The goal**

should be to evacuate residents prior to the event rather than trying to relocate them during or post-event. There should be a clear communication plan to alert residents when to evacuate and metrics to guide the decision to evacuate. The evacuation will require the coordination of several government agencies at the state, local, and county levels such as local emergency services, State Highway Patrol, and County Emergency Management. Residents should be relocated to areas outside of the floodplain until access is restored to the area.

Accessibility must remain at the forefront during the development of the plan. For example, some residents may not own cars, do not drive, may have to transport medical equipment, may have to transport children, and need to relocate pets or animals. Additionally, residents may be concerned about leaving their property behind during the flood or being unable to actively respond to flooding of their homes. As a part of the evacuation plan, resident education materials and checklists should be developed to include items to bring when evacuating, how to minimize personal property / home damage prior to flood events, and flood risk communication. The evacuation plan should be coordinated with the *Emergency Communications System* flood risk mitigation action. The proposed area to be included in the evacuation plan is shown in **Figure 711.**

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Staffing –** If County or Town staff do not have the capacity or expertise, a consultant planner should be hired to prepare the evacuation plan.		Staff Time	Operating Funds
2	**Review Existing Documents and Capabilities –** Review existing documents and procedures for emergency operations and evacuations. When procedures are not written down, staff may need to be interviewed. Additionally, perform an	1-2 Months	$50,000-$150,000	• Homeland Security Grant Program • Emergency Management Performance Grants
3	**Review Existing Transportation Conditions and Shelter Locations –** Review the existing transportation network to identify potential evacuation routes, traffic control features, flooding	1-2 Months		
4	**Community Engagement –** The community should be engaged to understand issues with evacuating, previous access issues during floods, concerns with evacuation, and needs during evacuation. An emphasis should be placed on understanding	2-3 Months		
5	**Develop Evacuation Plan –** Based on the identified community needs, an evacuation plan should be developed. Throughout the process stakeholders and the community should be engaged. The contents of the plan will vary depending on identified needs but should include evacuation phases, evacuation routes, decision tree for evacuation, evacuation shelters, communication procedures, personnel roles, and reentry conditions. The plan should also include checklists and guidance for residents evacuating on items to	2-3 Months		

Funding Sources

See table

Figure of Action

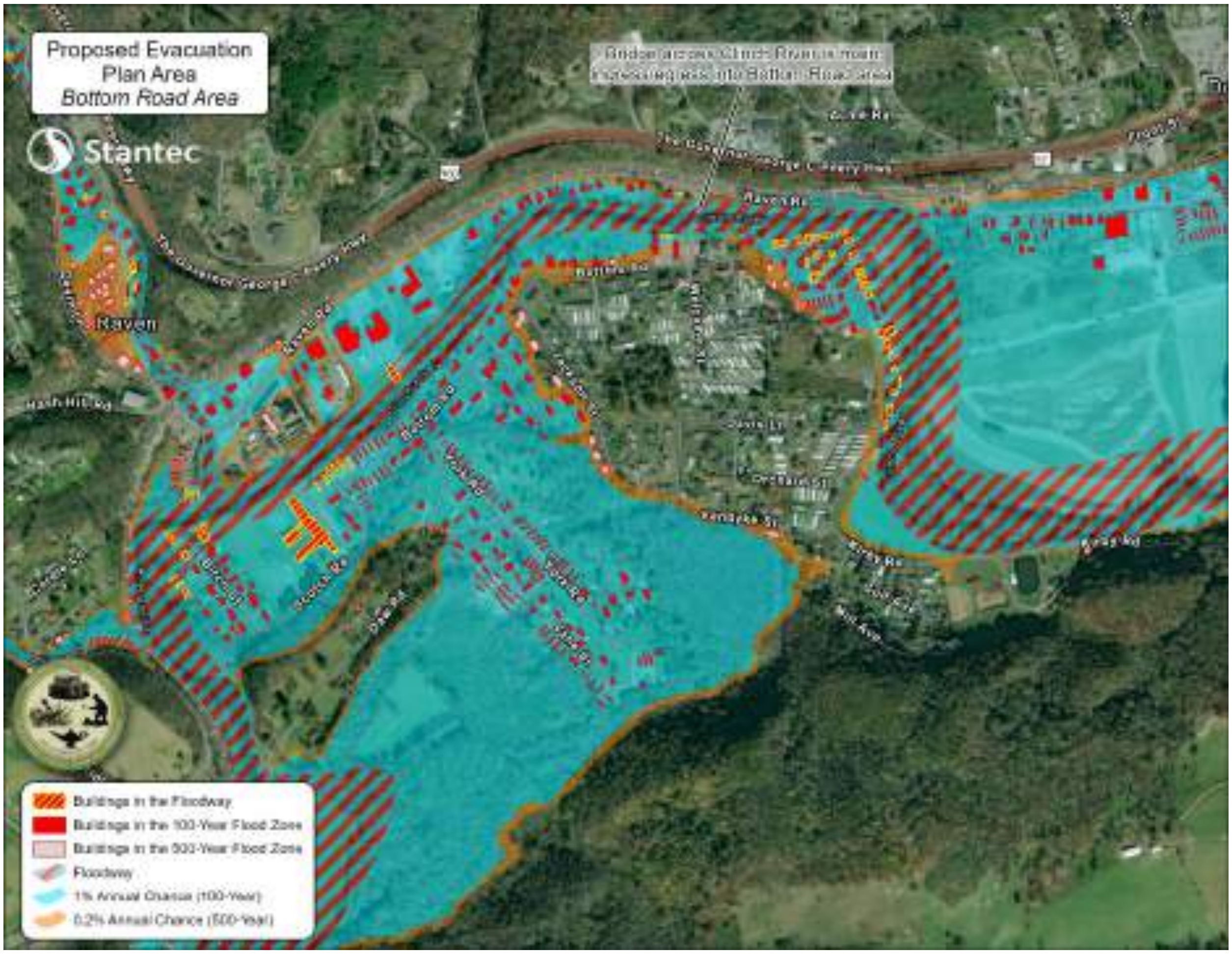


Figure 711: Proposed Evacuation Plan Area

Emergency Communications System

Problem Description

Given the frequency and severity of flooding events in Tazewell County, it is important for emergency services to be able to communicate with residents during flooding events to provide situational updates and emergency notifications. Tazewell County has a Reverse 9-1-1 system, but County staff noted the system is aging and does not allow for certain targeted communications. The County wants to be able to send geographically targeted messages in case of evacuation. Additionally, the County would like to leverage more advanced systems that connect with other technologies such as flood sensors.

The schools throughout Tazewell County must coordinate with students and parents during floods and heavy rain events. Specifically, the Richlands schools have routinely had issues with bus stops being blocked by flooding. When the bus must reroute, school staff must call each parent individually to inform them of the new bus stop. The Planning Team would like the emergency communications system to also be able to send targeted messages to parents to coordinate during flooding events.

Figures of Problem Area

N/A

Project Type

Planning

Total Estimated Cost

Dependent on Solution

Estimated Time to Complete

1 - 3 years

Project Lead

Tazewell County

Action Description

The County should procure a new emergency communications system to improve communications during flood events. As the existing system ages and needs replacement, a new system can give the county expanded capabilities to better communicate with residents. When upgrading the equipment, the County should coordinate with the Virginia Department of Emergency Management (VDEM) as well as engage residents to understand existing limitations and the best methods to reach the community. The County may be able to leverage state capabilities such as Wireless Emergency Alerts (WEA) sent directly to cellphones.

There are numerous emergency communications vendors and systems available to purchase. The County may consider working with a consultant to help identify the best fit for the County's needs before procuring the system. For any technology procured, standard operating procedures (SOPs) should be developed to detail how the system will be utilized during an event. The communications system can be paired with technology such as flood sensors strategically placed throughout the County. The sensors can alert the system operators of water levels, notifying them to push alerts to residents. Systems can also be purchased that allow for the creation of groups which will allow the school to send alerts to parents regarding bus stop relocation. The communications system should be included in the Bottom Road Area Evacuation Plan. It is recommended to establish the communications system prior to the Evacuation Plan so it can be included in the plan.

Emergency communications systems may contain features such as:

- Sending alerts to all cell phones in the area at risk using approved WEA channels.
- Allowing for groups to be set up to send targeted messages.
- Allowing for messages to be sent to individuals in a drawn geographic zone.
- Two-way communication between officials and residents.
- Sending prerecorded messages and text messages to improve response time.
- Connecting with flood sensors to recommend when alerts should be sent.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Identify Communication Needs –** Based on previous experiences, the County should identify features needed by the system. The County may request information from vendors to identify potential features of different	1 – 3 Months	$50,000-$75,000	• BRIC • Homeland Security Grant Program • Emergency Management Performance Grants • Section 165 of the Water Resources Development Act of 2020
2	**Stakeholder and Public Engagement –** The County should meet with stakeholders such as emergency services and the public to understand needs for the communication system. The County should gain an understanding of the communication methods	6-12 Months		
3	**Develop System Requirements and Use Cases –** Develop and document system requirements needed by the County and potential use cases for deployment. The requirements and use			
4	**System Procurement –** Issue a Request for Proposals (RFP) utilizing the system requirements and use cases. Applicants should demonstrate that the system can meet the requirements and integrate with the County's		Dependent on Selected Solution	
5	**Develop SOPs –** After selecting a system, the County should develop Standard Operating Procedures (SOPs) to guide the use of the system during emergencies. The SOP will describe the responsibilities of staff utilizing the system, establish procedures for implementing the system, and define cases when the system	6-12 Month	$50,000 - $100,000	
6	**System Implementation –** After developing and training staff on the SOPs, the system can be implemented. Public engagement and education will be needed to share the system and expectations with the public. For some	6-12 Months	Dependent on Selected Solution	
7	**Maintenance –** The system and SOPs should be tested frequently to ensure the system is ready for an emergency. Depending on the infrastructure associated with the system,	Ongoing	Dependent on Selected Solution	County Operation Funds

Funding Sources

See table

Figure of Action

N/A

Modeling and Analysis

Five Flood Risk Mitigation Actions have been identified in the Modeling and Analysis Category. These actions have problems and potential sources that have been identified but require modeling / analysis to select an alternative for implementation.

Intersection and Roadway Flooding

Problem Description

Throughout the County, there are multiple intersections and roadways that flood consistently creating unsafe access issues. In some cases, access to properties is completely blocked which creates a dangerous scenario especially when first responders are unable to access large areas. Additionally, many roads throughout the county serve as the singular ingress/egress point into large residential areas and businesses. When these roads get blocked, citizens can become stranded or may drive through unsafe road conditions. Approximately six inches of water can cause loss of control and possible stalling for most passenger cars.[2] A foot of water can float most vehicles and two feet of rushing water can carry away most vehicles.

Throughout the plan, the community has reported several roads and intersections that flood consistently. While some of the locations are a part of separate actions included in the plan, there were many other locations that flood frequently. The identified locations (not covered by other actions) are shown in **Table 72**.

Table 72: Intersection and roadway flooding hotspots Tazewell County

Cedar Bluff	Richlands	Bluefield
• Daw Road • Indian Drive • Wildwood Drive • Bandy Road	• East First Street • Allegheny Street Area (Including Fourth Street and Third Street) • Patton Street • 6th Street / Buskill Avenue • Hillcreek Road • Oriole Street at Eagle Street	• Yards Road at Waterbury Road • Falls Mills Road • Adams Drive • Walton Street • Dudley Street / Montrose Street Area • Mobile Estates at Hockman Pike • Morton Street at Thayer Street • Spring Street at College Avenue • Stockton Street at S College Avenue • Leatherwood Lane
Tazewell	**Pocahontas**	**North Tazewell**
• Chochran Hollow Road at Taylors Mill Road	• Water Street • Shop Hollow Road	• Fincastle Turnpike at Freedom Avenue (Fourway Area) • Lake Witten Road

In particular, the Town of Bluefield has reported several priority intersections and several streets in the downtown area that flood frequently. Bluefield Emergency Services has detailed several priority areas that cause routine issues and safety concerns. The priority areas are summarized in **Table 73**.

[2] "Turn Around, Don't Drown!", National Weather Service, [Turn Around Don't Drown (weather.gov)]

Table 73: Priority flooding hotspots Bluefield

Location	Problem Description
Dudley Street / Montrose Street Area	The area frequently floods with heavy rain events. Residents report moving their cars to higher elevations before predicted heavy rain events. The fire department has performed swift water rescues in this area. Flooding of the Dudley Street/ Montrose Street Area is shown in **Figure 712**.
Mobile Estates at Hockman Pike	The intersection gets frequently flooded. It is the only ingress/ egress into Mobile Estates. Despite putting up signage during floods, people still frequently drive through unsafe conditions because it is the sole access point.
N College Avenue at Thayer Street	The intersection and approaches flood during heavy rain events. The flooding blocks the access to the Bluefield Fire Department. Flooding has also caused some of the pavement to break away. Flooding from the May 29, 2023 flood impacting the fire station access is shown in **Figure 713** and **Figure 714**.
Downtown Bluefield	S College Avenue is the main road through Bluefield and runs alongside Beaverpond Creek in Downtown Bluefield. The road frequently floods blocking access to downtown Bluefield. In May 2023, College Avenue flooded which blocked the main route through town including the main route for emergency personnel. Spring Street has open channels that routinely flood and overtop the road. Many businesses are along the channel and are impacted by the flooding. Photos from the May 29, 2023 flood are shown in **Figure 715** and **Figure 716**.

Figures of Problem Area

Figure 712: Dudley Steet / Montrose Street area flooding

Figure 713: Flooding blocking access to the Bluefield Fire Department- May 29, 2023

Figure 714: Flooding outside of the Bluefield Fire Department- May 29, 2023

Figure 715: Flooding of College Avenue and Spring Street in Bluefield - May 29, 2023

Figure 716: Flooding of S College Avenue and Spring Street in Bluefield - May 29, 2023

Project Type
Modeling and Analysis

Total Estimated Cost
Approximately $35,000 to $90,000+ per study depending on the study area.

Estimated Time to Complete
0 - 1 year per site

Project Lead
Localities and Tazewell County

Action Description
Most localities within Tazewell County have roadways that routinely flood creating unsafe travel conditions for community members and emergency personnel. This mitigation action aims to present step by step instructions for how the County or Localities can address routine roadway flooding. Throughout the process, the public agency leading the actions should coordinate with VDOT for state owned infrastructure.

When an area is identified, the responsible agency should start by hiring a consulting engineer to develop Base Level Engineering (BLE) with 2D hydrology model coupled with a stormwater infrastructure hydraulic model for roadway flooding hotspots (hereafter refer to as 2D BLE hydraulic model). While typically this type of modeling is performed for larger areas, an engineer can develop a model on a micro scale to capture flooding sources impacting specific roadway sections and intersections. In these cases, the engineer will model a few intersections or roadway segments and the surrounding area that drains into it. The studies can be grouped geographically to gain efficiencies and avoid rework. As funding becomes available, the responsible agency should hire a consultant engineer to model the roadway segments and intersections grouped into geographic sections.

2D BLE hydraulic modeling has many benefits such as better integration of both overland (surface) and underground (subsurface) structures, multi-directional water flow, and velocity visualization. 2D BLE modeling also allows for more detailed understanding of the sources of the flooding such as riverine flooding or stormwater flooding. An example of 2D modeling is shown in **Figure 717**. After establishing the baseline model, the engineer can then run potential improvements through the hydraulic model to determine the optimal solution for the area that will reduce the risk of flooding. 2D BLE modeling is discussed in more detail in the *Raven / Doran 2D BLE Model Flood Risk Mitigation Action*. Potential improvements to mitigate roadway flooding could include stormwater system improvements, increased drainage capacity or retention, roadway elevation, or establishing alternative routes.

While long terms solutions are studied, the responsible department or agency should focus on communicating unsafe areas with the public and stopping drivers from driving through a flooded area. **All actions should be coordinated with VDOT and the Tazewell County Emergency Management Department.** Examples of strategies for **short term deployment** include:

- Placing temporary road closures to block access to flooded areas.
- Identifying alternative routes and procedures for emergency personnel when critical access points are blocked.
- Relocating equipment and personnel from fire, police, and EMS stations that have access frequently blocked by flooding prior to the flooding event. The Richlands Police and EMS Station, Richlands Fire-Rescue Station 3 (Claypool Hill), and Bluefield Fire Department have all been identified as having routine flooding issues.

- Placing portable variable message boards to communicate road closures, communicate flood risk, and encourage drivers to avoid flooded areas.
- Communicating road closures and unsafe areas for travel with the public. This can include:
    - Notifying local radio stations and television stations.
    - Publishing closures on local government social media accounts or websites.
    - Coordinating road closures with VDOT to include warnings on the 511 Virginia Traffic Information System.
    - Coordinating with 3rd party navigation systems such as Waze and Google Maps to display closures and flood risk areas.
- When there is warning time, take preventative measures along critical routes such as removing debris from the stormwater system and placing barriers such as sandbags prior to the flooding event.
- Placing flood sensors on bridges, roads, and culverts that flood frequently to provide flooding alerts.

Additionally, the Bipartisan Infrastructure Law (BIL) established the Promoting Resilient Operations for Transformative, Efficient, and Cost-savings Transportation (PROTECT) Grant program. The program provides funding to ensure surface transportation resilience to natural hazards by supporting planning activities, resilience improvements, community resilience, and evacuation routes. The PROTECT program provides $1.4 billion over 5 years. More detail is provided in *Appendix A – Funding Matrix*. The next round of applications for the competitive discretionary program is due August 18, 2023. Virginia is currently in the process of preparing a statewide Resilience Improvement Plan to increase the federal cost share under PROTECT. Tazewell County should coordinate with VDOT as soon as possible to have transportation resilience actions be included in the Resilience Improvement Plan and understand the process for receiving PROTECT Funds.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time	Estimate Cost (By Step)	Potential Funding Sources (By Step)
Short Term				
1	**Meet with VDOT regarding PROTECT –** Plan a meeting with Tazewell County officials and VDOT as soon as possible to have transportation resilience actions, such as this one, included in the Virginia Resilience Improvement Plan and gain a better understanding of how to leverage PROTECT Funds	2 weeks	Staff Time	• Operating Funds
2	**Identify Short Term Strategies –** While long term measures are being studied, review response procedures for managing roadway flooding at each jurisdiction level throughout Tazewell County. Engage with partners such as emergency personnel and VDOT to establish a streamlined short-term	2 weeks		
3	**Implement Short Term Strategies –** Once the strategies are identified, update procedures to implement the streamlined short-term response strategies. Strategies may include emergency planning, equipment procurement, stakeholder	1 month		
Long Term				
4	**Prioritize Flooding Hotspots –** As flooding hotspots are identified throughout the County; prioritize areas to focus on while tracking additional hotspots for consideration.	1 month	Staff Time	• SLAF • CFPF • PROTECT
5	**Staffing –** When a hotspot is selected to have modeling performed, hire a consultant engineer to develop a 2D BLE model for the identified area. There may be economies of scale for modeling several areas in proximity of each other at one time. The scope should include: - The area to be studied.	1 month		

Step #	Step Description	Estimated Time	Estimate Cost (By Step)	Potential Funding Sources (By
6	**Gather Initial Data -** Data will be needed to develop the 2D BLE model. More detailed data will allow the model to better represent the area. However, some data sources can be approximated if they are not available. To develop the model, high resolution lidar data is required. VDEM has lidar data available for Virginia online to download. The engineer will need to verify that the data is of sufficient resolution. Depending on the data available, the engineer may need to perform field work that may be outside of the initial scope. Examples of data sources that can be used to develop the model include: - Stream gauge data - Rainfall data - Historic flood data - Photos from floods - Building footprints	2 weeks	$35,000 to $90,000+	
7	**Develop Baseline 2D BLE Model -** The engineer will use the lidar data and initial data to develop the baseline model based on the existing conditions.	2 months		
8	**Study Existing Conditions -** The engineer will use the existing model to identify flooding trends, flooding hotspots, and stormwater issues. Stakeholders will be engaged to verify	2 weeks		
9	**Alternatives Analysis -** The engineer will identify mitigation action alternatives based on the identified problem areas. The community will select preferred alternatives to run	1 month		
10	**Study Preferred Alternatives -** The engineer will use the 2D BLE model to test the preferred alternatives to understand the effectiveness of each alternative. The engineer will make recommendations on which alternatives the community	1 month		
10	**Communicate and Document Results -** The engineer will communicate the results with the stakeholders for final feedback on the alternatives. The engineer will document the results. The results can be incorporated into grant applications by the community to pursue funding for design	1 month		

Funding Sources

- See Table

Figure of Action

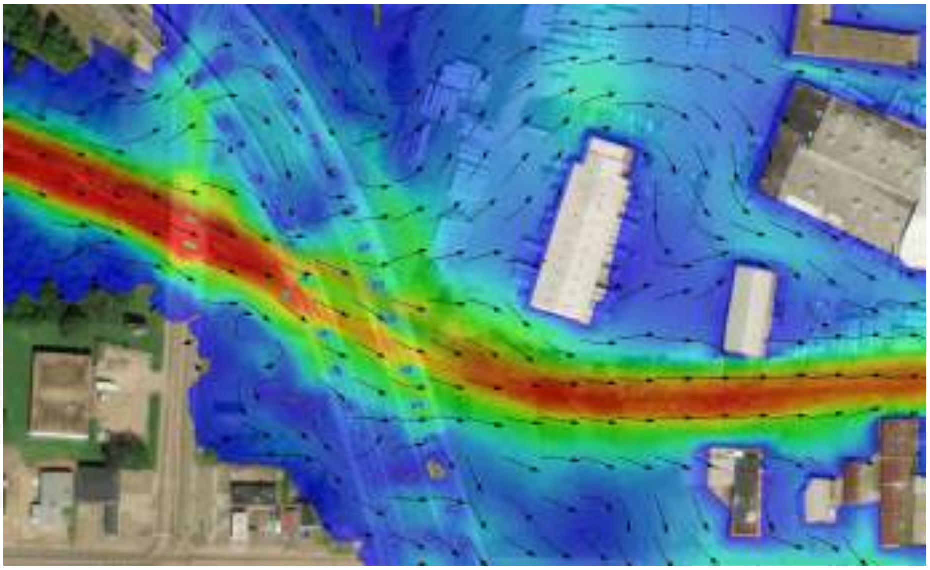


Figure 717: Example of 2D BLE Modeling[3]

[3] "Completing the picture: The future of hydraulic modeling is two dimensional", Stantec, [Completing the picture: The future of hydraulic modeling is two dimensional (stantec.com)]()

Assess Flood Risk Reduction Options for Blacksburg Street Community

Priority Action

Problem Description

The Blacksburg Street community is a historically black community in North Tazewell. Many long-time residents share strong ties, having raised their families in the community. The community of ten to twelve houses used to be much larger and once included its own church. The neighborhood is a mixture of long-time residents and renters. The community reports frequent flooding from multiple sides of the creek including flood waters running down Blacksburg Street completely blocking access. During the 2003 flood, several members of the community had to be rescued from the church due to flooding.

Residents are distressed about minimal flood warning time, blocked access, flooding from multiple directions, and worsening flooding. Additionally, many long-time homeowners in the community are aging, and are concerned about negative equity impacts due to increased flooding. At the end of the day, residents are concerned about their ability to pass down intergenerational wealth. The community reports frequent flooding from multiple sides of the creek, which is worsened by the mill building, beaver dams, sedimentation, and debris. The flooding issues are shown in **Figure 718**. A photo of the Blacksburg Street flooding is shown in **Figure 719**. Most of the neighborhood is in the 100-year floodplain. Residents report that they have not received recovery aid following previous floods and they cleanup their properties without any assistance. Residents are growing increasingly concerned due to worsening flooding. Residents are concerned about losing their homes and the equity they have built in their homes, being unable to evacuate, and being unable to recover when they are impacted by another flood. Most residents in the neighborhood do not have flood insurance due to the high cost of flood insurance and because they own their homes free and clear and thus are not required to keep flood insurance.

Figures of Problem Area

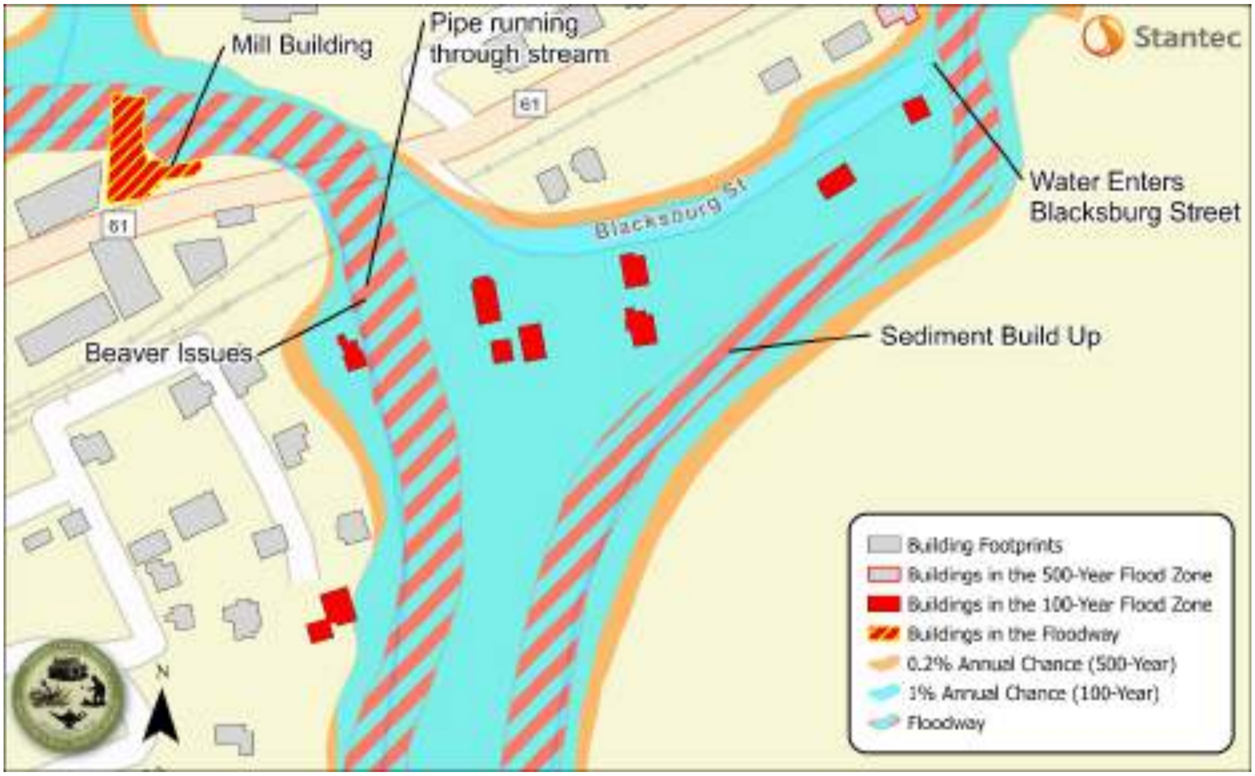


Figure 718: Blacksburg Street Flooding Issues

Figure 719: Flooding of Blacksburg Street

Project Type
Modeling and Analysis

Total Estimated Cost
$150,000 +

Estimated Time to Complete
1 – 3 years

Project Lead
Tazewell County

Action Description
There are several actions in the mitigation plan that have the potential to help reduce flood risk for the Blacksburg Street Community such as the removal of the Abandoned Mill Building, the acquisition of undeveloped parcels for flood storage, and the acquisition of properties to return to natural areas for flood storage**. Throughout the implementation of the plan, the Blacksburg Community should be regularly engaged as it is a historically underserved community with a high level of flood risk.** As demonstrated by the residents at the second public meeting, the community wants to take action to minimize flood risk, but it needs support to help mitigate.

As the County pursues flood risk reduction, the County should assess flood risk reduction options for the Blacksburg Community through a formalized study. The community must be engaged throughout the study process with consideration given to historic context and equity. Prior to implementing other mitigation actions that could impact the Blacksburg Street Community, the County should study the benefits and impacts to the Blacksburg Street Community. Mitigation actions that could impact the Blacksburg Community include:

- The removal of the abandoned mill building and associated dam
- Acquisition of undeveloped parcels
- Acquisition of developed properties

Additional mitigation actions may be needed to minimize flood risk for the Blacksburg Street Community. The formalized study may consider other alternatives that could benefit the Blacksburg Street Community such as:

- Debris and sediment removal
- Structural flood protection solutions
- Access improvements to Blacksburg Street
- Beaver management

As mentioned previously, **the County and its consultants must actively engage the community throughout this process to understand and incorporate local priorities.** If acquisition is the preferred alternative, flood modeling would not be needed as a part of the FEMA Hazard Mitigation Assistance (HMA) funding requests since the existing Flood Insurance Study (FIS) can be leveraged or pre-calculated benefits could be used. A consultant could be hired to assist with the FEMA HMA acquisition application, costing approximately $10,000. A flood modeling and alternative analysis approach as proposed below would cost over $100,000.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By	Potential Flooding Sources (By Step)
1	**Desktop Study –**Hire an engineer to perform a preliminary desktop study of the area. Given the extent of flooding issues faced by the Blacksburg Street Community, acquisition might be the preferred alternative. An engineer can review the existing conditions, hydrograph, and perform a quick storage calculation. This assessment will give a better	2 weeks	$2,500	• County Operating Funds
2	**Community Engagement -** Early on, the Blacksburg Community must be regularly and purposefully engaged in order to understand the goals of the residents and help prioritize mitigation alternatives. Several meetings and/ or engagement methods are warranted to introduce the options, give residents time to consider, and move forward with a formalized study of preferred alternatives. The County may need to engage stakeholders individually or in smaller groups to ensure everyone is	2 months	County Staff Time	
3	**Pursue Funding -** Once the County and community have identified alternatives to study, the next step is for the County to pursue funding for the study. The study may be pursued as a step toward other mitigation actions such as the removal of the abandoned mill building. If the alternatives include other actions such as the removal of the abandoned	1 month	County Staff Time	• HMGP Advanced Assistance • BRIC Capability and Capacity Building • CFPF
4	**Alternatives Study –** Hire a consulting engineer to study the flood mitigation alternatives for the Blacksburg Street Community. The study will include hydraulic modeling of the area before and after mitigation measures are applied and perform a benefit cost analysis of the mitigation measures. The scope of the study should be	3 months	150,000 +	
5	**Alternative Selection –** Present the results of the alternative analysis to the community for feedback. The County should work with the community to prioritize mitigation actions based on the results of the study and select	2 months		

Ste p #	Step Description	Estimated Time to	Estimated Cost (By	Potential Flooding Sources (By Step)
6	**Pursue Funding –** Once actions are selected for implementation, the County will need to pursue funding for the implementation of the selected actions. Depending on the selected actions, consulting firms would likely need to	2-3 months	County Staff Time	• HMGP • BRIC • CFPF • Others dependent on

Funding Sources

See table

Figure of Action

N/A

Inflow and Infiltration of Stormwater into Wastewater System

Problem Description

During extreme rainfall events, the County reports that rainwater is entering into the wastewater collection system which increases the peak flow and amount of flow into wastewater treatment plants in the county service area, known as inflow and infiltration (I&I). Inflow is surface water that enters the wastewater system. Sources of inflow include water entering the system from yards, roofs, storm drains, downspouts, and holes in manhole covers. Infiltration is groundwater that enters pipes. Sources of infiltration include holes, breaks, joint failures, connection failures, and cracks. There are multiple sources of I&I as shown in **Figure 716**.[4]

The extraneous flow into the wastewater collection system affects the capacity and operation of the wastewater treatment plants. Specifically, the Richlands Wastewater Treatment Plant and Tazewell Wastewater Treatment Plant have had significant issues during rainfall events when stormwater enters into the wastewater system. This has caused sewer overflows leading to untreated wastewater entering streams and leads to risk of sewer backup in citizen's houses. In addition to the environmental and social impacts, the wastewater treatment plants are also fined by EPA.

[4] "What is infiltration and inflow?", King County Wastewater Services, What is infiltration and inflow? - King County

Figures of Problem Area

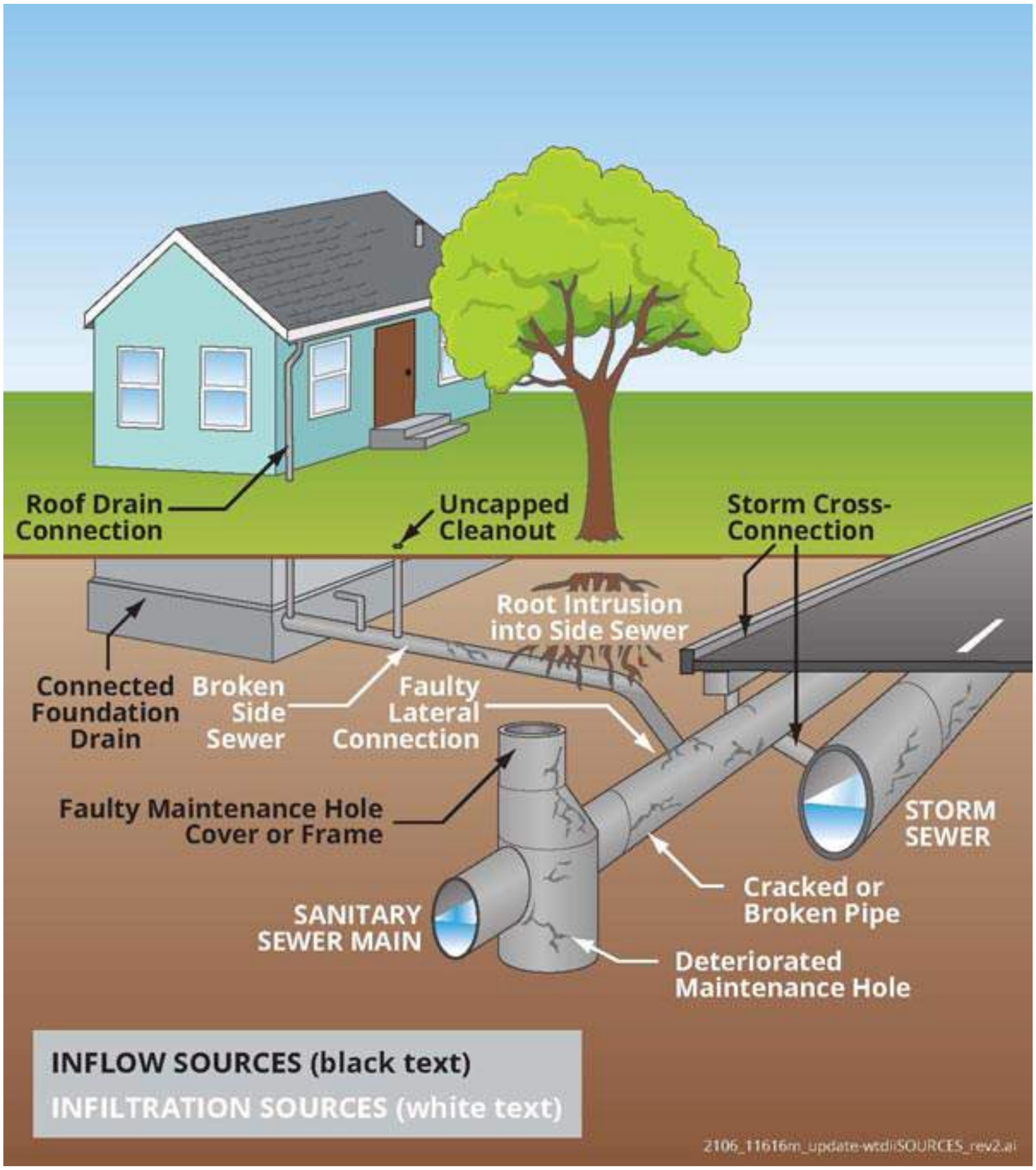


Figure 720: Sources of I&I

Project Type

Modeling and Analysis

Total Estimated Cost

Dependent on selected improvements (rehabilitation or upsizing facilities)

Estimated Time to Complete

3 – 5 years

Project Lead

Town of Richlands and Town of Tazewell

Action Description

Various studies of the wastewater system can be performed to understand the sources of I&I and key problem areas. A series of steps is proposed to understand the problem in a cost-effective manner by using available data sources to prioritize the problem areas. By first identifying problem areas, more expensive and invasive testing can be limited to focused locations. An example of testing is shown in **Figure 717**. Additionally, throughout the process, it is important to understand community goals and expected level of service. Recommendations for future projects and solutions should be selected under the advisement of an engineer. Potential solutions could include additional retention increased storage, sewer rehabilitation, maintenance, part replacement, stormwater management, coordination with the EPA, and/or operational changes.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By
1	**Identify Data Sources and Data Reviews –** Hire a consultant to collect and review data for preliminary desktop study. The scope should specify data sources needed to perform the desktop study and include review of the quality of the available data. Preliminary data can be utilized to help identify problem areas rather than having to perform testing throughout the system. Data could include spatial data of the wastewater system, work order history, interviews with staff, historic sewer flow data, rainfall data, monthly reports, fine history, and overflow reports. If	4 weeks	$7,500	• Area Development Program • Section 319(h) Nonpoint Source (NPS) Implementation Program • VCWRLF
2	**Preliminary Desktop Study -** Depending on the data available, an engineer can perform a preliminary desktop study. From reviewing the data sources, the engineer can make preliminary estimates of the source of the overflows (for example whether the source is a capacity issue or stormwater infiltration). The engineer can also review the data to gain a better understanding of the frequency of overflows, the rainfall events associated with overflows, and the history of fines. Based on the preliminary desktop study, the engineer will provide recommendations for the next steps. The engineer will also work with the Towns to understand the goal level of service for the Wastewater Treatment Plant which may involve	4 weeks	$15,000	
3	**I&I Study -** If I&I is confirmed as the likely cause of the overflows, a consultant can be hired to perform a detailed I&I study. The I&I study should be conducted to isolate and prioritize problem areas in smaller sub-basins. System-wide flow monitoring should be conducted as the first phase in the I&I study. An I&I analysis should be conducted utilizing the sewer flow monitoring data. The deliverable of the I&I study will be a technical memo summarizing the key problem areas, and the amount of inflow/infiltration that enters the wastewater system. The scope of the study should be developed under the advisement of an engineer and be reviewed in comparison with	4-6 months	$50,000 - $75,000+	
4	**Model Development and Calibration** – This step will be conducted if I&I study (Step 3) determines that there is significant I&I enters wastewater system. Using the flow monitoring and GIS data, a simplified H&H model will be built to support capacity assessment and improvement alternatives evaluation.	2 months	$50,000	

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By
5	**Capacity Assessment & Alternatives Evaluation –** Using the H&H model developed under Step 4, an engineer can determine the existing level of service and wastewater system performance under different storm conditions. The engineer will identify potential solutions to reduce/eliminate overflow. Solutions may include I&I source reduction (rehabilitation), additional storage, or sewer replacement. The practicality of I&I removal needed to meet the overflow reduction goal	1 month	$35,000	
6	**Alternative Selection -** With input from the community and under the advisement of an engineer, a preferred alternative or alternatives should be selected. Opinions of potable construction costs for each alternative will be estimated to support decision	1 month	$15,000	
7	**Sanitary Sewer Evaluation Survey (SSES) Investigations –** This step will be conducted only if I&I removal / reduction is part of the selected alternative under Step 6. The I&I study will prioritize the problem areas into high, medium, and low for the severity with recommendations for additional field investigations SSES to narrow down the source of I&I. Various SSES techniques exists, and typically the first step is to	6-12 months	$100,000 +	• Operating Funds • VCWRLF
8	**Design & Permitting -** After a preferred alternative is selected, a consultant engineer may need to be hired to design the identified solution. Additional surveys or data may be needed to complete this assessment. Permits will need to be acquired depending on the selected alternative. Some activities may be covered under the existing collection system permit while others may require permits for construction. Completed plans will allow the responsible party to hire or issue a request for bids for a contractor.	12 months	Based on the solution. 10% of the construction fee.	• Area Development Program • Section 319(h) Nonpoint Source (NPS) Implementation

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
9	**Construction -** The selected contractor will build the selected solution based on the design.	Dependent on solutions	Dependent on solutions	• Area Development Program • CBDG • Section 319(h) Nonpoint Source (NPS) Implementation Program • USDA Water & Wast
10	**Maintenance -** Depending on the selected solution, routine maintenance may be needed. A maintenance plan should be made including maintenance	Annually	Dependent on solutions	• Operating Funds

Funding Sources

Included in Steps Table

Figure of Action

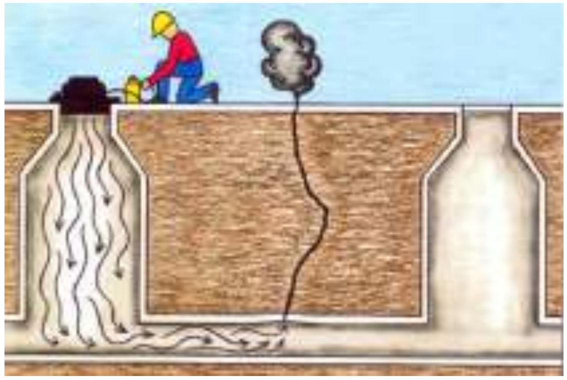


Figure 721: Smoke testing for I/I[5]

[5] "Wastewater Smoke Testing", Iowa Sioux Center, [Wastewater Smoke Testing | Sioux Center, IA - Official Website]

Lynn Hollow Road Flood Mitigation

Problem Description

Residents along Lynn Hollow Road report that water and sediment flood their homes during heavy rainfall events. They report that their basements are frequently flooded with water containing a strong foul odor, and their driveways are filled with debris. Residents indicate the water and sediment originates from the Tazewell County landfill when the lower ponds overflow during heavy rainfall events. The creek is shown in **Figure 718.**

The County reports the water is coming down the mountain into resident's yards and not from the landfill as demonstrated by a prior landfill study. The ponds do not have a regular maintenance schedule which the County recognizes could be beneficial for short and long-term pond maintenance. The ponds are dredged as needed to maintain the active stormwater permit.

The project team also noted there are several agricultural uses upstream of the homes with flooding issues. Several of the properties have fences for animal pastures that extend across the stream. From an initial site observation, the stream appears unstable which could be a source of sediment. A map of the area is shown in **Figure 719.**

Figures of Problem Area

Figure 722: Creek along Lynn Hollow Road

Figure 723: Lynn Hollow Road Area

Project Type
Modeling and Analysis

Total Estimated Cost
$250,000 - $650,000 depending on selected solution

Estimated Time to Complete
1 – 3 years

Project Lead
Tazewell County

Action Description
Perform a comprehensive Watershed Study to understand the source of the flooding. Once the problem is better understood, the engineer will be able to recommend potential solutions. Potential solutions could include retrofit of existing stormwater features, new structural stormwater projects, procedural changes, routine maintenance of the landfill ponds, agriculture community engagement, and stream channel stabilization & widening.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Preliminary Site Visit -** Hire a consultant water resource engineer to perform a preliminary site visit to inspect the area. The engineer should review the ponds for signs of breeching and overtopping. The engineer should inspect the creek along Lynn Hollow Road for signs of stormwater and sediment bypassing the retention pond, stream stability, and agriculture	1-2 months	$8,000	
2	**Perform a Watershed Study -** From the direction of the engineer, it is anticipated that a Watershed Study will be recommended. Potential recommendations could include contributing watershed hydrologic calculations, 1D HECRAS model of the	2-6 months	$40,000	
3	**Identify Alternatives -** Based on the identified flooding sources, the engineer can make recommendations for specific mitigation actions. If the landfill is identified as a flooding source, the engineer may need to perform additional studies of the landfill infrastructure and operating procedures. The engineer will identify solution alternatives and prepare conceptual schematics for review. Solutions could include retrofit of existing features, new structural projects, or procedural changes. Examples of alternatives are stream bed erosion	2-6 months	$30,000	• CFPF • SLAF • VCWRLF
4	**Alternative Selection -** With input from the community and under the advisement of an engineer, a preferred alternative or alternatives should be selected. Funding should be identified for design and construction to move the project toward	1-2 months	$10,000	
5	**Design** - After a preferred alternative is selected, an engineer may need to be hired to design the identified solution. Additional surveys or data may be needed to complete this assessment. Completed plans will allow the responsible party to hire or issue a request for bids for a	6-12 months	$50,000+	• CFPF • Five Star and Urban Waters Restoration • Section 319(h)

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
6	**Permitting** – Depending on the solution selected, permits may be required to construct the selected alternative. These may include, but are not limited to environmental permits, land disturbance permits, and land use permits. The engineer should work with the community to obtain the proper permits. There may be costs associated with obtaining each	4-12 months	$15,000+	Nonpoint Source (NPS) Implementation Program • SLAF • Virginia Clean Water Revolving Loan Fund (VCWRLF) • Virginia Pooled Financing Program
7	**Construction** - The selected contractor will build the selected solution based on the design. The cost will vary based on the	2-6 months	$100,000 - $500,000	
8	**Maintenance** - Depending on the selected solution, routine maintenance may be needed. A maintenance plan should be made including maintenance frequency,	Annually	Dependent on Solution	• County Funds

2D BLE Modeling

PRIORITY ACTION

Problem Description

There are several priority areas in Tazewell County that have suffered the greatest impacts from recent floods. Many of these areas contain large residential areas or critical infrastructure in proximity to the river or within the floodplain. Additionally, many of these areas are only accessible by a singular access point that frequently floods. Multiple factors are reported to contribute or worsen the flooding in these areas. The priority areas are summarized below.

The **Bottom Road Area** is one of the most impacted areas in the County from recent flooding. Within the area, there are a large number of residents living in proximity to the river or within the floodplain. During the 2020 floods, the National Guard performed rescues in this area. The area is shown in **Figure 724** and **Figure 725**. There are multiple factors contributing to or worsening the flooding impacts in this area including:

- Many homes are within the floodplain and were constructed prior to the flood ordinance.
- Many of the homes are mobile homes and are more vulnerable to flooding.
- The VDOT bridge along Bottom Road is the main access point to the large residential area in the floodplain and frequently overtops.
- Residents reported increased flooding following the bridge upgrades.
- Residents reported water running up stormwater pipes during flooding events.
- Raven Road is also used to access the area and frequently floods.

The **Mill Creek Road Area** is a residential area along 5 miles of Mill Creek Road which runs parallel to Mill Creek. There is no floodplain mapping along Mill Creek. There are multiple factors contributing to or worsening the flooding problems in this area including:

- Residents report flooding along Mill Creek Road where Mill Creek runs parallel to the road.
- There are many privately owned driveways crossing Mill Creek which capture debris. Debris build up in the creek minimizes stream capacities and worsens flooding.
- Residents report access to Mill Creek Road (approximately 5-mile residential area) is blocked by flooding at the intersection with Nash Hill Road near Plaster's Discount Furniture. The area is shown in **Figure 726** and **Figure 727**.

Downtown Bluefield has a history of flooding issues due to its location along Beaverpond Creek. While some mitigation actions were taken previously, flooding is still a problem as experienced during the flood on May 29, 2023. The flooding is shown in **Figure 728**. The main flooding issues include:

- S. College Avenue is the main road through Bluefield and runs alongside Beaverpond Creek. It floods throughout the downtown area.
- Beaverpond Creek splits into an open channel that runs alongside Spring Street and several businesses. These channels have been a hotspot for flooding by overtopping Spring Street and impacting the businesses along the channel.

- The main access of the Bluefield Fire Station is blocked by flooding along College Avenue at Thayer Street.

The **Richlands School Area** contains Richlands Elementary School, Richlands Middle School, Richlands High School, a shopping center, and several businesses. The area has frequent stormwater flooding issues. In addition, the schools are used for shelters for the community during emergencies. The main flooding issues include:

- Stormwater blocks the main entrance to the schools at the intersection of Cedar Valley Road at Learning Lane.
- Stormwater infrastructure along Cedar Valley Road exceeds capacity and drains are frequently blocked.
- The area is surrounded by several mountain peaks and contains a large amount of development with impervious surface.
- There is minimal stormwater infrastructure or retention in the area.
- The elementary school parking lot floods from stormwater lines exceeding capacity as discussed in the *Richlands Elementary School Stormwater* flood risk mitigation action.
- The County reports that engineers previously studied the area and found that most of the area sits above an aquifer.
- The middle school auditorium floods frequently. The County believes the source is groundwater and water running down the slope behind the school.

Figures of Problem Area

Figure 724: Bottom Road/ Kirby Road during the February 6, 2020 flood (Source: Donna Whittington)

Figure 725: Clinch River along the Bottom Road area during the February 6, 2020 flood

Figure 726: Plasters Discount Furniture alongside Mill Creek during regular conditions

Figure 727: Culvert crossing Mill Creek

Figure 728: Downtown Bluefield flooding – May 29, 2023

Project Type

Modeling and Analysis

Total Estimated Cost

Approximately $80,000 for 600 acres and study of 4 alternatives.

Proposed Study Areas	Area (acres)
Bottom Road Area	930
Mill Creek Road Area	600
Downtown Bluefield	40
Richlands School Area	150

Estimated Time to Complete

1 – 3 years per area

Project Lead

Tazewell County

Funding Sources

- Virginia DEQ Stormwater Local Assistance Fund (SLAF)
- CFPF Grants

Action Description

Develop a Base Level Engineering (BLE) with 2D hydrology model coupled with a stormwater infrastructure hydraulic model for the identified areas in Tazewell County (hereafter refer to as 2D BLE hydraulic model). It is recommended to include the Bottom Road Area, Mill Creek Road Area, Downtown Bluefield and Richlands School Area. The studies can be pursued individually or together. Projects grouped geographically such as the Bottom Road Area and Mill Creek Area may result in some savings compared to completing them separately.

2D Base Level Engineering (BLE) hydraulic modeling is an emerging type of modeling that has many benefits. Traditional floodplain mapping (1D) is tied to streams and is developed for flood insurance requirements. It also has limitations to tie to underground stormwater sewers. Traditional models stop at a set boundary surrounding a stream and are developed as cross sections. The areas between cross sections are interpolated which can limit accuracy. Traditional modeling is also limited to showing one direction of water flow, has limited integration of structures, and has limited velocity visualization. An example of 1D modeling is shown in **Figure 729**.

Figure 729: Traditional 1D Modeling

2D BLE models are developed using lidar data to visualize the entire area. The use of lidar data allows for better integration of both overland and underground structures, multi-directional water flow, and velocity visualization. 2D BLE models show the interaction of the modeled area with both riverine flooding and stormwater flooding. For areas with complicated flooding issues, 2D BLE models allow for a more detailed understanding of the flooding occurring and the factors influencing it. An example of 2D modeling is shown in **Figure 730**. The U.S. Army Corps of Engineers is performing some flood modeling and surveying in Richlands. Results from that study may supplement the 2D model.

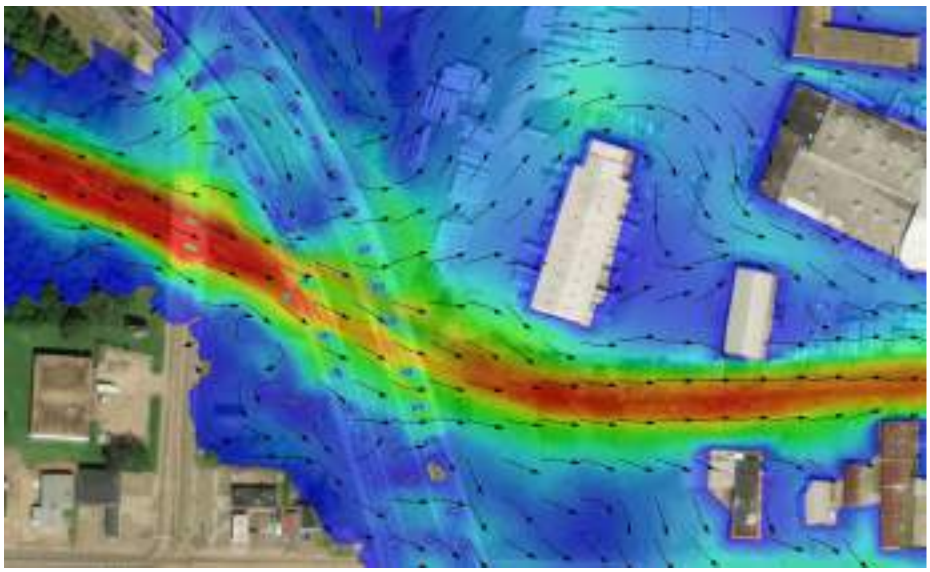


Figure 730: Example of 2D Modeling[6]

The 2D BLE model will allow engineers to better understand the existing flooding and then test proposed solutions. Engineers can run the proposed solutions in the model to gain an understanding of the flood risk reduction for each solution. Based on the model, engineers can also make recommendations for acquisition for properties with the highest flood risk.

The proposed study areas with some identified flooding hotspots are shown in **Figure 732 – Figure 734**. The proposed study areas are recommended due to reported flooding issues. The actual model boundaries will depend on the drainage, topography, and watersheds in each area. The model extents should be developed under the advisement of an engineer.

[6] "Completing the picture: The future of hydraulic modeling is two dimensional", Stantec, [Completing the picture: The future of hydraulic modeling is two dimensional (stantec.com)]

Figure 731: Mill Creek Flooding Hotspots and Proposed Modeling Area

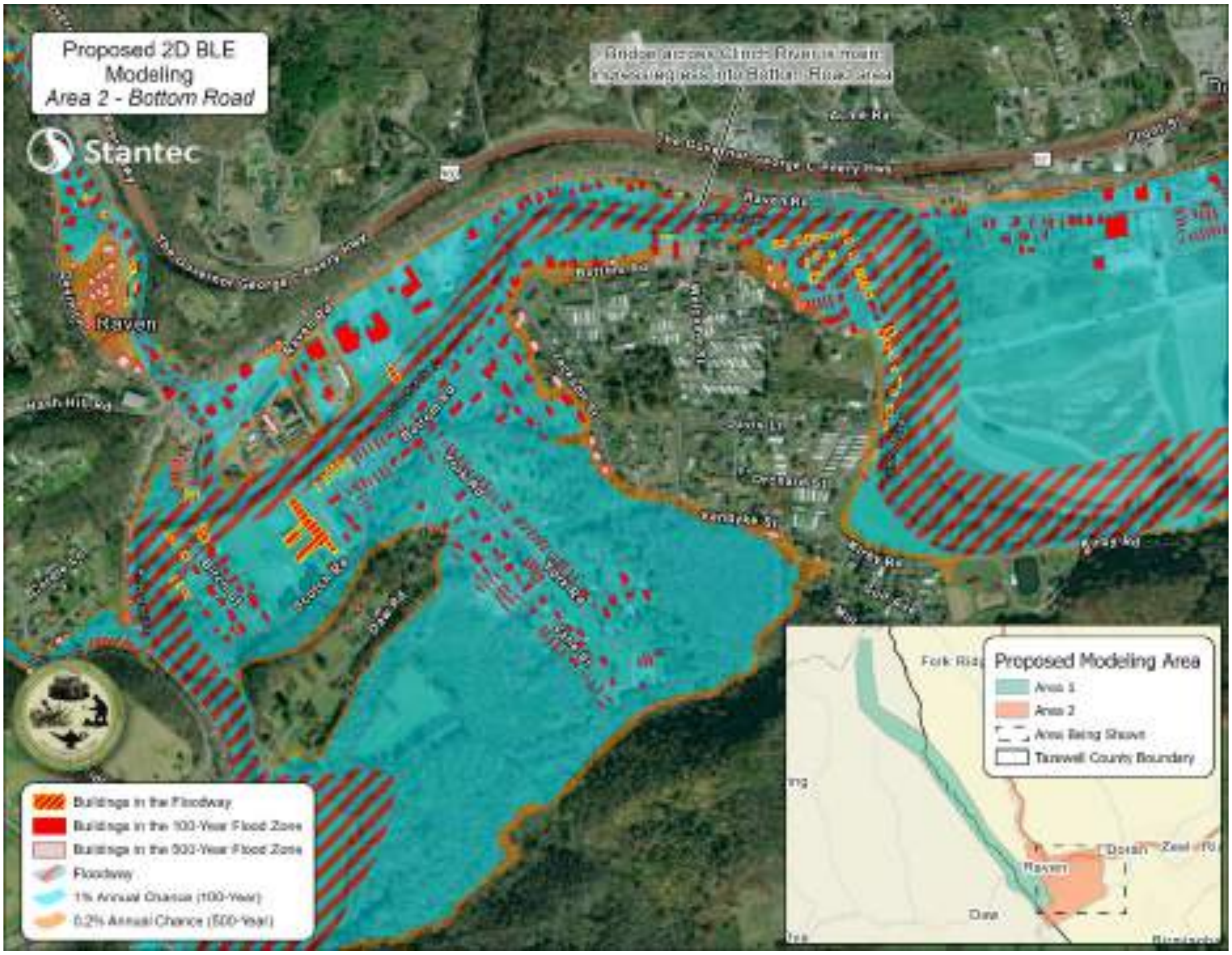


Figure 732: Bottom Road Flooding Hotspots and Proposed Modeling Area

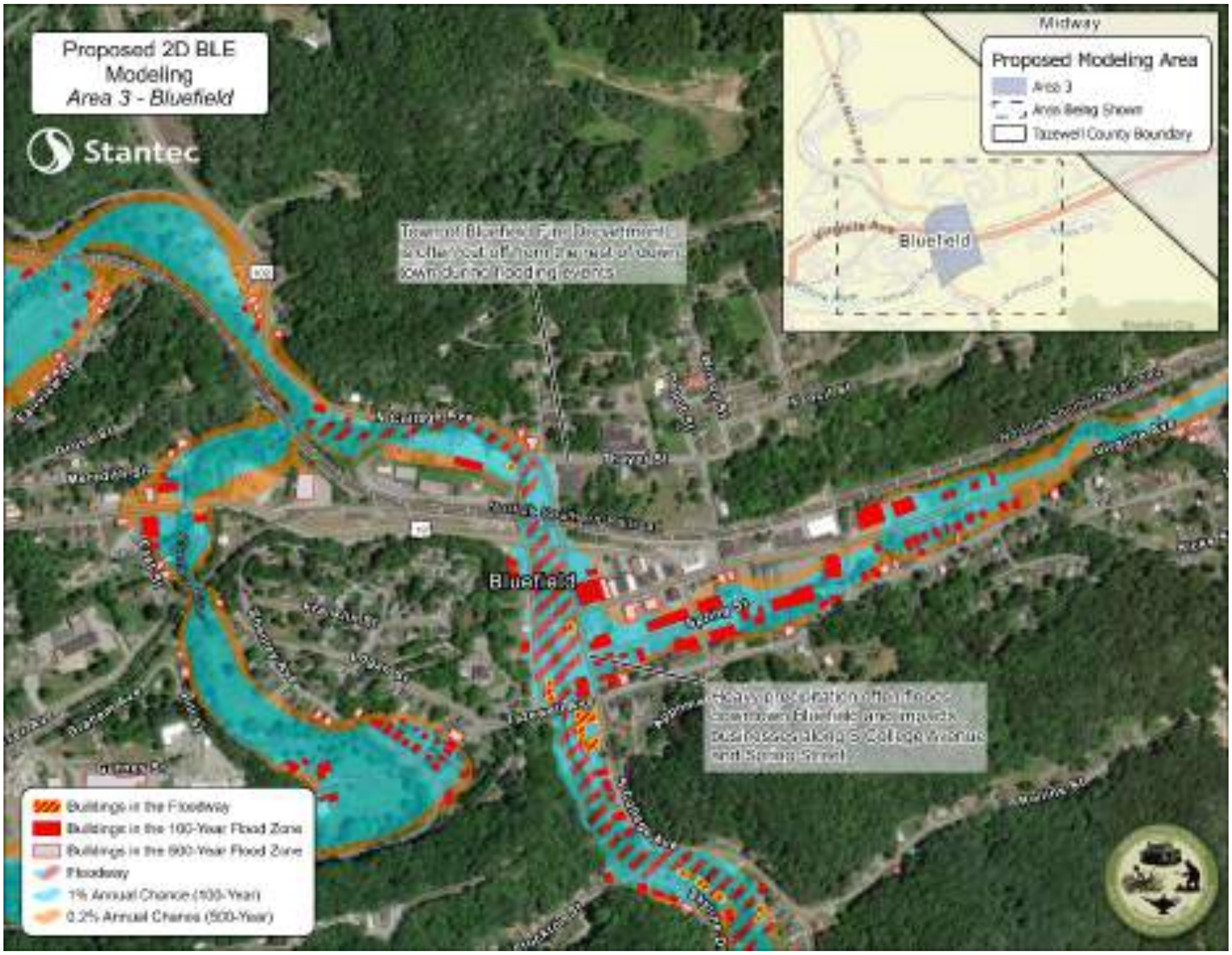


Figure 733: Bluefield Flooding Hotspots and Proposed Modeling Area

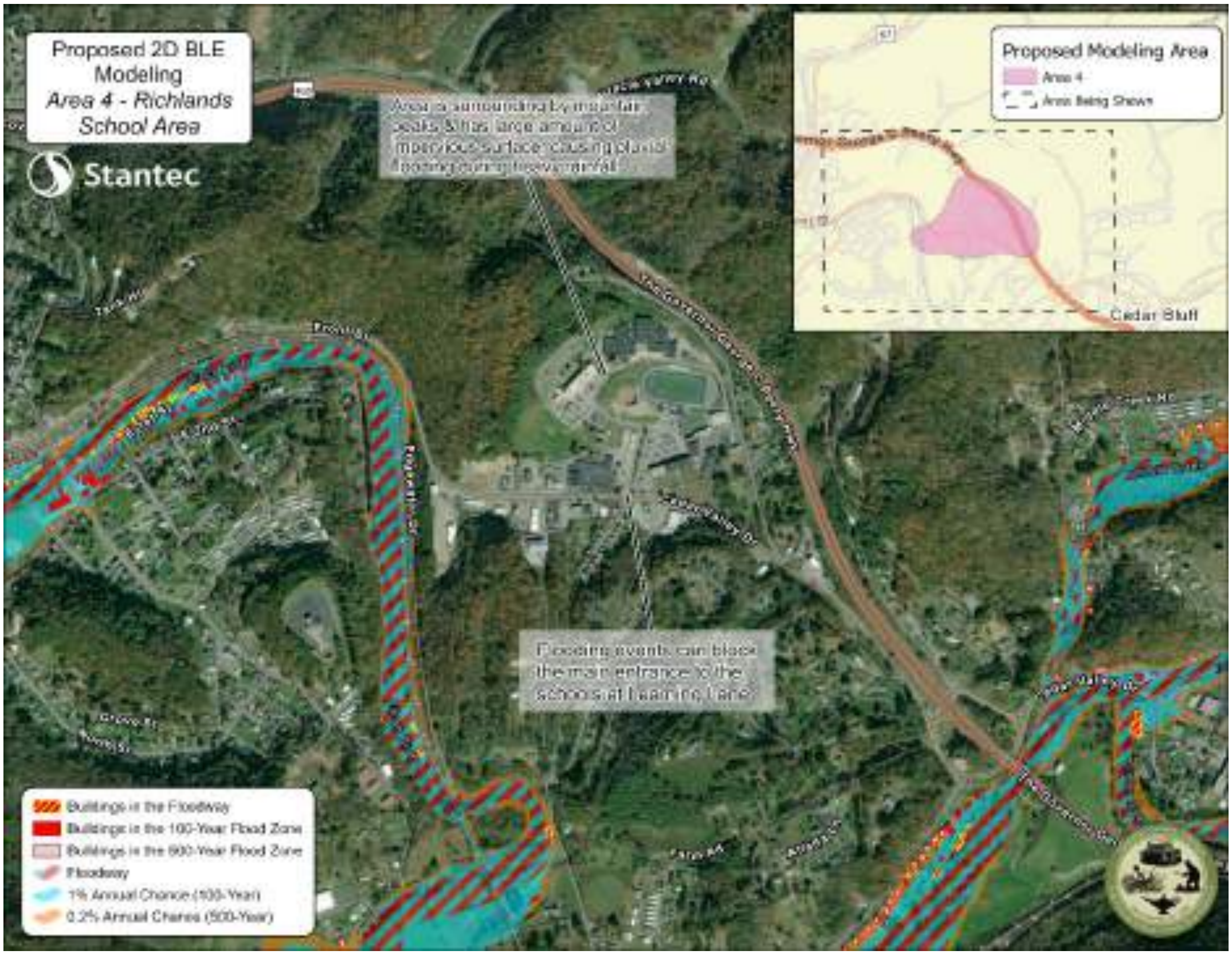


Figure 734: Richlands School Area Flooding Hotspots and Proposed Modeling Area

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time	Estimate Cost (By Step) *	Potential Funding Sources (By
1	**Staffing -** Hire a consultant engineer to develop a 2D BLE model for a designated area. The area could be one of the priority areas or multiple depending on available funding. The scope should include: - The area to be studied. - Checkpoints for community and stakeholder engagement. - The number of mitigation actions to be studied in the		County Staff Time	• Virginia DEQ Stormwater Local Assistance Fund (SLAF) • CFPF Grants
2	**Gather Initial Data -** Data will be needed from the County to develop the 2D BLE model. More detailed data will allow the model to better represent the area. However, some data sources can be approximated if they are not available. To develop the model, high resolution lidar data is required. VDEM has lidar data available for Virginia online to download. The engineer will need to verify that the data is of sufficient resolution. Depending on the data available from the County and other sources, the engineer may need to perform field work that may be outside of the initial scope. Examples of data sources that can be used to develop the model include: - Stream gauge data - Rainfall data - Historic flood data - Photos from floods		$5,000	
3	**Develop Baseline 2D BLE Model -** The engineer will use the lidar data and initial data to develop the baseline model, reflecting existing conditions.		$35,000	
4	**Study Existing Conditions -** The engineer will use the existing model to identify flooding trends, flooding hotspots, and stormwater issues. The County will engage the community		$8,000	
5	**Select Preferred Alternatives -** The engineer will identify mitigation action alternatives based on the identified problem areas. The community will select preferred alternatives to run through the model under the advisement		$8,000	
6	**Study Preferred Alternatives -** The engineer will use the 2D BLE model to test the preferred alternatives to understand the effectiveness of each alternative. The engineer will make recommendations on which alternatives the community		$16,000	

Step #	Step Description	Estimated Time	Estimate Cost (By Step) *	Potential Funding Sources (By
7	**Communicate and Document Results -** The engineer will communicate the results with the community for final feedback on the alternatives. The engineer will document the results. The results can be incorporated into grant applications by the community to pursue funding for design		$8,000	

*Cost Estimate is assuming approximately 600 acres in the study area

Funding Sources

See Table

Figure of Action

N/A

7. Action Plan (continued)

Confirm Feasibility, Design, and Implement

Three Flood Risk Mitigation Actions have been identified in the Confirm Feasibility, Design, and Implement category. These actions have preliminary solutions that have been identified for implementation. Prior to implementation a feasibility study should be performed to confirm the benefits of the identified solution and possible barriers to implementation. Feasibility needs to be confirmed to avoid paying for solutions without confirming they have the proper benefit. Identified costs, estimated time to complete, and funding sources are provided at a high planning level and should be confirmed during the feasibility study.

Removal of Abandoned Mill Building and Associated Dam

Priority Action

Problem Description

The abandoned mill building, and associated dam (formerly Farm Bureau) obstruct the creek, as shown in **Figure 71**. The dam and building block the natural flow of the creek as well as capture significant debris. Residents have noted the mill building contributes to the flooding of the community on Blacksburg Street by causing water to build up. The community reports frequent flooding from multiple sides of the creek, which is likely worsened by the mill building, beavers, sedimentation, and debris. The location of the dam and its relation to the Blacksburg Street Building is shown in **Figure 72**.

Figures of Problem Area

Figure 71: Mill Building March 2023 capturing debris

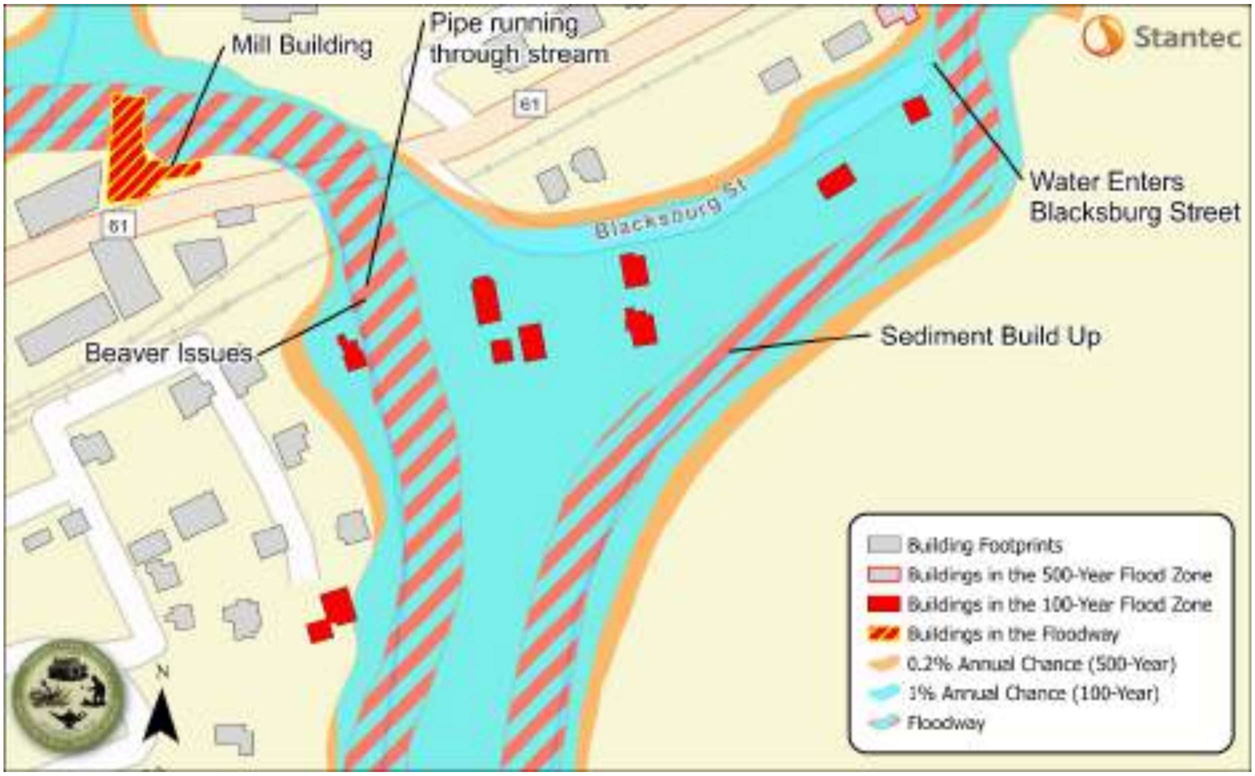


Figure 72: Mill building location

Project Type
Confirm Feasibility, Design, and Implement

Total Estimated Cost
$3.4 - $4.5 million

Estimated Time to Complete
5 + years

Project Lead
Town of Tazewell

Action Description
Pursue the removal of the mill building and dam to restore the natural flow of the creek, limit the accumulation of debris, and reduce flooding of the Blacksburg Street Community. **The property owner and community should be engaged early and often throughout the process**. Given the presence of several endangered species of mussel in the Clinch River, U.S. Fish and Wildlife Services should be engaged throughout the project to ensure all environmental regulations are met. In order to meet environmental regulations, actions may need to be taken throughout the project to protect mussels such as mussel surveys and mussel relocation. This action should be pursued in conjunction with other actions to mitigate flooding of the Blacksburg community such as:

- Acquisition of undeveloped parcels for flood storage
- Acquisition of properties to return to natural recreation areas.

- Assess flood risk reduction options for Blacksburg Street Community

Given the high projected cost, the Town may need to hire a consultant to assist with grant preparation and benefit cost analysis. The Town should consider grants that cover planning, design, and construction as this is a large multiphase project. Separate funding sources will likely need to be pursued throughout the project to cover the phases. Consultants can be hired to assist with the preparation of grant applications especially to be competitive for large federal grants. For example, consultants are frequently hired to assist with BRIC grants and the required benefit cost analysis. A BRIC application prepared by a consultant typically costs at least $50,000.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Project Scoping and Development –** The removal of the structure will be a high-cost project that has the possibility for multiple phases. To start pursuing implementation, it is recommended that the Town engage the community, engage the property owner, and pursue larger grant opportunities. Recommend engaging the property owner early and often to verify that the property owner is open to selling. Additionally, the community should be engaged to receive feedback and help develop plans for the site once the structure is removed. When pursuing grants such as HMGP or BRIC, the Town may need to hire a consultant to assist	3-4 months	$50,000 + (BRIC application prepared by a consultant)	• HMGP Advanced Assistance • BRIC Capability and Capacity Building • CFPF • Fish Passage Technical and Planning Assistance
2	**Gap Analysis and Document Review –** Recommend a consultant engineer be hired to assess and design the removal of the structure from the river and floodplain. The first step is to review and collect existing data such as as-builts, endangered species presence, and existing hydraulic information. The engineer can then determine data needed to complete the	2 weeks	$350,000 - 400,000	
3	**Topological and Geomorphic Survey –** The engineer will have a topological and geomorphic survey performed to gain a better understanding of stream stability	1 month		
4	**Hydrologic and Hydraulic Modeling (H&H) Modeling –** A study will need to be performed to understand the impact of the structure removal on the river and surrounding areas. This study may be performed as a part of the Assess Flood Risk Reduction Options for the Blacksburg Street Community Mitigation Action. The study will give a better understanding of the impact to downstream properties from the	2 months		

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
5	**Alternatives Study –** Based on the results of the H&H Modeling, the engineer may need to review alternative approaches for removing the structure. This could include possible grade control structures, floodplain storage, and stream stabilization. The engineer can then provide a recommendation to the County for removal. The alternative study is recommended to include cost estimates for each alternative.	2 months		
6	**Design & Permitting –** Once the preferred alternative is selected, an engineer can lead the design and permitting process. Given the complex nature of the project, the engineer may need to perform additional steps such as survey collection, biological studies, and federal agency coordination. The engineer should	4+ months		• Community Challenge • BRIC • Five Star and Urban Waters Restoration • Outdoor Recreation Legacy Partnership (ORLP) Land and Water Conservation Fund • CFPF • Recreational Trails Program • Virginia Land Conservation Fund • Section 319(h) Nonpoint Source (NPS) Implementati on Program • SLAF • Get Outdoors (GO) • Preservation Trust Fund
7	**Structure Removal –** Hire a contractor to remove the structure from the stream while minimizing environmental impacts. The contractor should obtain and follow all proper	1+ years	$3,000,000 - $4,000,000	
8	**Stream Restoration –** Following the removal of the structure, restore the surrounding area and stream to natural areas. The area may serve as public amenities such as a public park, walking trails, or kayak launch. Development rights should be maintained to avoid future development on the property.	1-2 years		

Funding Sources

- See Table

Figure of Action

N/A

Richlands EMS and Police Station Relocation

Priority Action

Problem Description

The Richlands EMS and Police Station are both located in the 1% Annual Chance Floodplain as shown in **Figure 73**. They are in separate buildings located on the same property and utilize the same access points. The County reports frequent flooding of the access points along Allegheny Street, preventing ingress/egress. During the 2020 floods, the access points were inundated, which impeded response, as shown in **Figure 74**.[1] The National Guard brought in boats to assist with the emergency response efforts. The access was also blocked during the February 2023 floods. The Town has not reported flooding impacts to the buildings. The Town previously considered relocating the police station; however, funding was not secured.

[1] "More flooding out of Richlands, Virginia in Tazewell County", Billy Bowling, WOAT TV, More flooding out of Richlands, Virginia in Tazewell County. Video provided by Billy Bowling. - YouTube

Figures of Problem Area

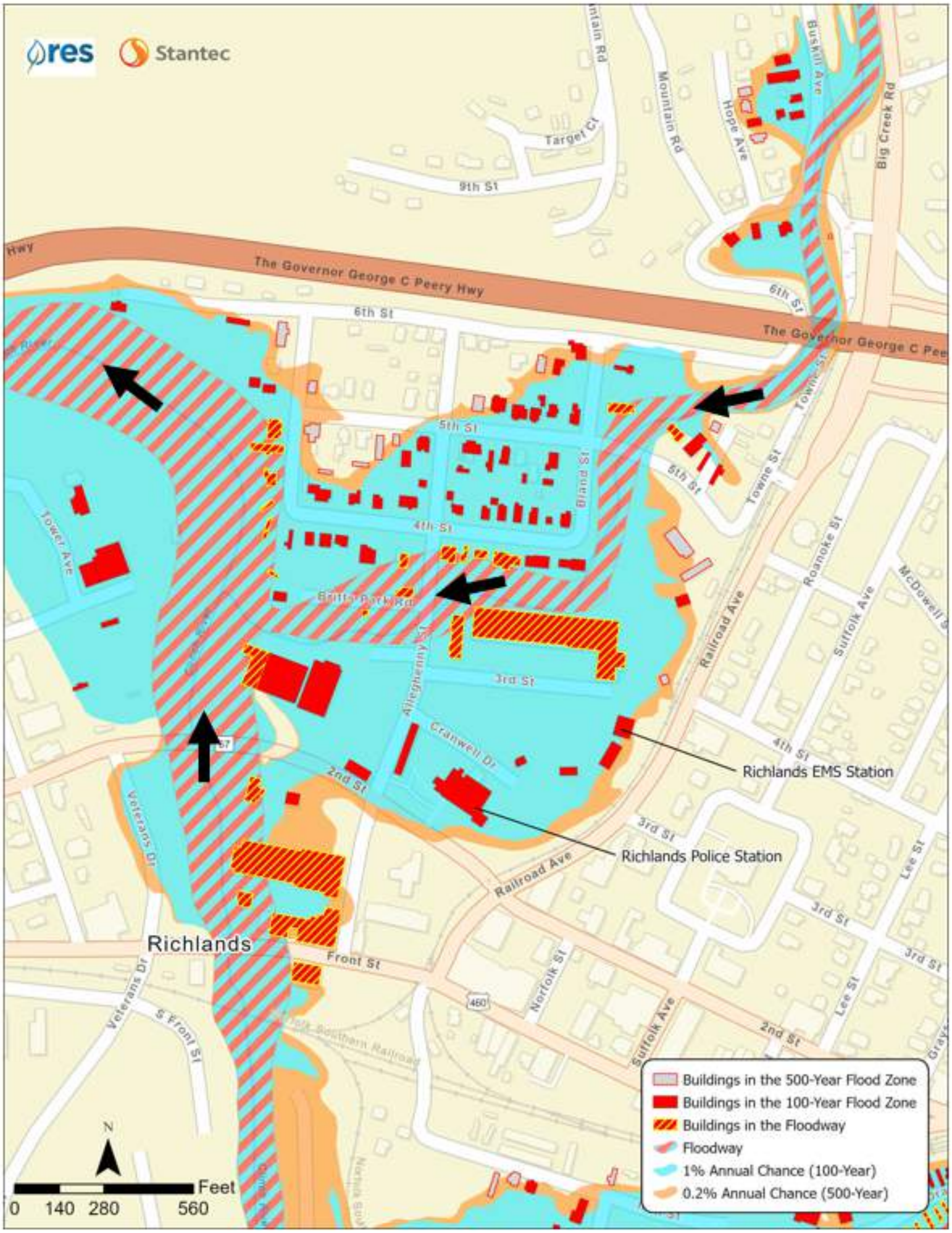


Figure 73: Richlands EMS Station and Police Station Location

Figure 74: Richlands EMS and Police Station during the February 2020 Floods

Project Type
Confirm Feasibility, Design, and Implement

Total Estimated Cost
$ 6 million +

Estimated Time to Complete
5 + years

Project Lead
Town of Richlands

Action Description
Relocate the EMS Station and Police Station outside of the floodplain. The EMS Station can be acquired and demolished to utilize as natural flood storage or a public amenity such as a playground. The Planning Team has expressed a desire to maintain the police station building to supplement the recreation facilities on the property. The building was previously a school, so it has a gym and spaces for gathering. To best meet the community's needs, two routes can be pursued to minimize flood risk to the police station. With both routes, the police station (personnel, property, and equipment) will be relocated outside of the flood plan. The two options are shown below:

1. **Relocate and Repurpose** – Relocate the police station outside of the floodplain to minimize flood risk to the critical facility. Elevate or floodproof the structure to utilize as a community center to enhance the open space utilization on the property. The center will not house any critical services.

2. **Acquire, Relocate, and Restore** – The rights to the property will be acquired to limit future development. The police station will be relocated outside of the floodplain to minimize flood risk to the critical facility. The existing structure will be demolished and restored to natural space or a public amenity such as a park.

The preference of the Planning Team is to pursue relocation and repurpose. However, both routes are listed as grant funding may be more streamlined for restoration-based projects. When pursuing grant funds, the EMS Station and Police Station projects may be grouped together or separately as funding becomes available.

If the critical facilities are damaged by a declared disaster, relocation of the facilities may be eligible for FEMA's Public Assistance (PA) program. PA funds could be used for activities such as relocating the police and fire services personnel and equipment to a new location. In most instances, FEMA grant applications require the preparation of Benefit Cost Analysis (BCA). When flooding events occur, the Town should start tracking all impacts to the Police and EMS Stations and any overtime hours. Under PA they can seek reimbursement for emergency protective measures undertaken and these costs can help support and justify the relocation of the facilities. Direct damages to the EMS or Police Station would likely be required in order to relocate utilizing FEMA funds.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Identify Funding Source –** As this is a larger project with multiple phases, the Town may need to pursue grant funding to assist with project scoping, studies, and larger grant applications. For pursuing larger grant opportunities such as HMGP or BRIC, a consultant or disaster recovery services coordinator may be beneficial to prepare the application. HMGP Advanced Assistance or BRIC Capability and Capacity Building grants may be pursued to assist with planning and scoping to	1 month	Staff Time	• HMGP Advanced Assistance • BRIC Capability and Capacity Building
2	**Identify New Location Outside of the Floodplain –** A new location must be identified for the facilities. A study may be needed to decide on the best location for the facilities. Considerations for the study include proximity to the floodplain, proximity to the service area, and the roads providing access to and from the service area. The Town may also consider existing facilities outside of the floodplain that may be converted to house the Police Station and/or EMS Station. The Town should consider grants when selecting the site for the new facilities. Some grants may	3-6 months	$100,000 +	
3	**Pursue Funding Source –** Once the Town has identified the new location and goals for each site, pursue grant funds for design, construction, demolition, and restoration as applicable. HMGP Advanced Assistance or BRIC Capability and Capacity Building grants may be pursued to assist	3 months	$50,000 + for BRIC application prepared by a consultant	

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
4	**Design New Facilities** - Once a site has been selected, hire and architect to design the facilities. The architect will lead coordination with other professionals as needed for the design of the building. The buildings may be new construction or retrofits to existing facilities.	6 months	$6 million +	• Community Challenge • BRIC • Community Flood Preparedness Fund (CFPF) • FMA (Requires Flood Insurance) • Virginia Pooled Financing Program
5	**Permitting** – Depending on the solution selected, permits may be required for construction. These may include, but are not limited to environmental permits, land disturbance permits, and land use permits. Permits may include additional fees.	6 months		• Community Challenge • BRIC • Community Flood Preparedness Fund (CFPF) • FMA (Requires Flood Insurance) • Virginia Pooled Financing Program • HMGP
6	**Construct New Facilities** – Hire a contractor to construct the new facilities according to the	1-2 years		
7	**Relocate Operations –** Develop a plan to smoothly transition operations from the existing facilities to the new locations. The plan will need to incorporate the transition while continuing the	3 months		
8a	**Demolish Existing Facilities and Restrict Future Development** – As applicable, demolish the existing structures to restore the locations to natural space. Restrict future development on the site. An engineer may need to be hired to design plans for the safe demolition of the buildings	2-3 months		

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
8b	**Restore Natural Areas –** As applicable, restore the sites to natural areas to allow for flood storage. The natural areas may include public amenities such as a park or green space that are able to flood. Given the history of floods of the area and location in the floodplain, consider integrating the restoration with other buyouts in the future. For example, the commercial shopping centers along Big Creek. Some of the grants for restoration may also be leveraged for design of the restoration, natural areas, and public amenities.	2-3 months	$6 million + Dependent on Solution	• Five Star and Urban Waters Restoration • Outdoor Recreation Legacy Partnership (ORLP) Land and Water Conservation Fund • Rivers, Trails, and Conservation Assistance (RTCA) • Transportation Alternatives Program (TAP) • Recreational Trails Program • Virginia Land Conservation Fund • Section 319(h) Nonpoint
8c	**Floodproofing** – If the Police Station building is retained to supplement the recreation facilities as a community center, the building will need floodproofing to help mitigate potential damages. Flooding proofing could include elevation, wet floodproofing, or dry floodproofing. Examples include installing openings to allow the entry / exiting of floodwaters and reduce hydrostatic pressure, raising critical mechanical and electrical	Dependent on Solution		• HMGP • BRIC • PA Section 165 of the Water Resources Development Act of 2020

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
9	**Maintenance** - Depending on the selected and constructed solution, routine maintenance may be needed. A maintenance plan should be made including maintenance frequency, actions needed, associated costs, and funding.	Dependent on Solution	Dependent on Solution	• Town Operating Funds

Funding Sources

See Table

Figure of Action

N/A

Richlands Elementary School Stormwater

PRIORITY ACTION

Problem Description

Two county stormwater lines run underneath the school campus of Richlands Elementary School and are exceeding capacity. Additionally, a stormwater drain that is part of the system is frequently blocked. During heavy rain events, the elementary school parking lot floods. This parking lot is used for student drop-off and pick-up and gets covered in excess stormwater blocking access. The pipes are unable to be relocated easily as they run directly underneath the school. The school campus is shown in **Figure 75**.

Figures of Problem Area

Figure 75: Richlands School Campus

Project Type

Confirm Feasibility, Design, and Implement

Total Estimated Cost

$450,000 +

Estimated Time to Complete

2 – 5 years

Project Lead

Tazewell County and Tazewell County Public Schools

Action Description

An engineer can perform a hydraulic study to confirm that excess stormwater is the source of the flooding. Once the source is confirmed, the engineer will calculate the target reduction volume and study potential solutions. It is anticipated that a gray infrastructure and/or a nature-based solutions will be needed to improve stormwater retention and reroute the flooding from the parking lot. Tazewell County has areas at risk to karst which may require more detailed soil surveys to design retention-based solutions. Additionally, previous studies have identified an aquifer underneath the school property which may require more data collection.

Steps (step #, step description, timeline, estimated cost)

	Step Description	Estimated Time to	Estimated Cost/LOE (By Step)	Funding Sources (By Step)
Ste				
1	**Baseline and Initial Conditions Review** - A stormwater engineer will review existing information provided by the County and perform a preliminary site visit. This review will allow the engineer to gain a basic understanding of	1 month	$3,000	• SLAF • CFPF
2	**Preliminary Hydrologic Study** - A stormwater engineer will perform a preliminary hydrologic study to identify a target reduction volume for the improvements. For the study, additional surveys and/or soil assessments may be	3-6 months	$3,000	
3	**Alternative Review** - Based on the identified target reduction volume and flow study, a stormwater engineer will identify three alternatives to reach the target reduction volume. The engineer will assess the viability of each option and provide a comparison of the alternatives to assist with selection. The stormwater engineer will	6-12 months	$7,000	
4	**Design** - After a preferred alternative is selected, the stormwater engineer will design the identified solution. Additional surveys or data may be needed to complete the design. Completed plans will allow the responsible	6-12 months	$40,000	
5	**Permitting** – Depending on the solution selected, permits may be required to construct the stormwater improvements. These may include, but are not limited to environmental permits, land disturbance permits, and	8-12 months	$15,000	
6	**Construction** - The selected contractor will build the selected solution based on the design.	1-3 months	$350,000 (dependent on solution)	
7	**Maintenance** - Depending on the selected and constructed solution, routine maintenance may be needed. A maintenance plan should be made including maintenance frequency, actions needed, associated costs,	Annually	Dependent on solution ($1,500 / yr.)	

Funding Sources

- See table

Figure of Action

N/A

Programmatic

Six Flood Risk Mitigation Actions have been identified in the Programmatic category. These actions represent those that are needed at a large scale in multiple areas throughout the County or those that are policy-based. They have been developed into programs so the County can address these problems on an ongoing basis often with the assistance of contractors to supplement county staff.

Beaver Management Program

Problem Description

Beavers are the largest rodent in North America and can be found across the United States. County staff and the community have reported beaver presence worsening flooding in areas throughout the County. Beavers and beaver dams have many ecological benefits such as providing habitat for other species, slowing water velocity, changing water temperatures, and improving water quality.[2] However, as reported in Tazewell County, beavers can also cause significant damage. Most damage caused by beavers is the result of dam building and associated flooding, bank burrowing, and tree cutting. Beaver damage in Virginia is estimated to cause losses from $3 million to $5 million annually.[3] Beaver dams can impede stream flow leading to worsening flooding and standing water often in areas that would not otherwise flood frequently. Beavers can also increase debris in streams. Beavers build two types of dens. Lodges are free standing dens built similarly to dams in slower moving ponds. The second type is known as a bank den. Bank dens and associated access tunnels can collapse and damage property and infrastructure.

Figures of Problem Area

N/A

Project Type

Programmatic

Total Estimated Cost

Dependent on the number of sites per year

Estimated Time to Complete

Ongoing Program

Project Lead

Tazewell County

Action Description

While beavers have many ecological benefits, there are times when it becomes necessary to control beavers in an area to protect property and infrastructure. Therefore, it is recommended that Tazewell County establish a Beaver Management Program. An effective Beaver Management Program should include identification of potential and existing beaver-related activity that could impact county infrastructure and/or personal property. In areas where there is the potential for beaver activity, there are several non-lethal activities that can be implemented to deter beaver use of an area. These include

---

[2] "Environmental Benefits of Beavers", King County, Environmental Benefits of Beavers - King County

[3] "Beaver Removal", Virginia Professional Wildlife Removal Services, Beaver Removal - How To Get Rid Of Beavers | VA Pro Wildlife Removal (virginiaprofessionalwildliferemovalservices.com)

exclusion (fencing, barriers to prevent beavers from accessing an area), repellents (sprays, devices to deter beavers) and habitat modification (removing vegetation near the water's edge).[4] Given the environmental importance and protections surrounding the Clinch River, any treatment methods should consider permitting requirements and environmental impact.

Areas with existing beaver activity should be similarly evaluated to determine if there is a threat to infrastructure or personal property. In Virginia, live trapping and relocating beavers to another area is not permitted. Therefore, problem beavers will need to be removed using lethal methods and proper disposal. There are many non-lethal measures such as bypassing flow or fencing that may be more appropriate and cost effective when compared to lethal trapping. However, there are some scenarios where lethal measures may be necessary, as described below.

Some situations that may warrant lethal measures could include:

- Flooding from beaver dams impacting public infrastructure causing safety concerns such as worsening flooding of primary ingress/egress routes.
- Flooding from beaver dams threatening structures and infrastructure upstream of the dam.
- A large beaver colony forming which is likely to cause future issues.

As part of the Beaver Management Program the County should explore options for contracting with one or more Wildlife Management and Control Contractors. The selected contractor(s) should have the appropriate training, safety program, insurance, and Commercial Nuisance Permits. The County should work with the contractor to understand the best treatment method for each unique case.

The County may also explore the use of local trappers in the area. By allowing them access to trap and keep the fur, the County may save money and help control beavers. This option would only apply during the appropriate trapping season in the County.

When a beaver is trapped, the beaver dam should be immediately removed to mitigate the flooding issues. The beaver dam should be disposed of outside of the floodplain extents to minimize debris entering the stream. Following the removal of the beaver and the dam, other treatment measures should be considered to prevent other beavers from relocating to the same spot. Examples could include fencing, barriers, and repellants.

Several initial priority areas have been identified during stakeholder engagement for beaver control including:

- Blacksburg Street Area in North Tazewell
- Springville Area
- Leatherwood Lane / College Drive area in Bluefield

Additionally, any treatments that impact the Clinch River may require environmental permits. **The environmental permitting process may need to be included in the Habitat Conservation Plan developed in the Routine Debris Removal action**. The hired contractor should be licensed and

[4] "Beaver Removal", Virginia Professional Wildlife Removal Services, [Beaver Removal - How To Get Rid Of Beavers | VA Pro Wildlife Removal (virginiaprofessionalwildliferemovalservices.com)](virginiaprofessionalwildliferemovalservices.com)

knowledgeable about permitting requirements. Depending on the contractors' abilities, it may be possible to hire the same contractor for debris removal service.

The County should draft and issue an RFP for contractors for the Beaver Management Program. The contract should include a yearly retainer and set pricing for routine beaver removal activities such as site investigations, non-lethal beaver deterrents, and trapping for a set length of time. The contract should also include procedures for communication, expected time between notification and treatment, and procedures for working on private property. The County should work with the contractor to gain permission before entering or implementing beaver control on private property.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Establish Program –** Identify County staff to manage the beaver control program. Staff will be responsible for identifying priority areas, managing funding, hiring a contractor, and			
2	**Identify Priority Areas –** Recommend the County supplement the priority areas in this plan by identifying additional hot spots for beaver control. These hotspots could be identified through engagement methods such as staff interviews or public surveys. The County			
3	**Identify Funding Source –** Identify an annual funding source for the program as funding will most likely come from County Operating Funds.	0 - 2 years	Staff Time	
4	**Hire On-Call Contractor –** Recommend the County hire on-call contractors for beaver control. The contract should include the processes to be followed by the contractor and County once a site has been identified. Additionally, the contract should include set costs for routine control activities. The contractor should maintain a Virginia Commercial Nuisance Animal Permit and be			County Operating Funds
5	**Maintain Program –** Recommend the County actively work to maintain the program. When sites are identified for beaver control, the County should notify the contractor. The contractor should visit the site and provide the County with treatment recommendations. After approval by the County, the contractor should	Annual Basis	Dependent on treatment	

Funding Sources

- See table

Figure of Action

N/A

Routine Debris and Sediment Removal Program

PRIORITY ACTION

Problem Description

Throughout the planning process, public and planning team input has included issues with debris build up that reduces stream capacities and worsens flooding. Residents report increasing issues with debris and sediment associated with growth in logging in the area and minimal debris removal from the previous floods.

Woody debris in rivers is an important component of the structural and functional elements of riverine ecosystems. Wood in rivers may provide grade control, retain dissolved and particulate organic matter, provide a food source for aquatic invertebrates, and cover for fish. Rivers may recruit wood through a variety of mechanisms including bank erosion, windthrow, landslides, tree mortality, and/or flood pulses (periodic inundation of the floodplain). However, debris and sediment may accumulate at dams, culverts, and low-lying bridges, leading to infrastructure damage. Debris jams have been observed throughout Tazewell County by residents and County staff as shown in **Figure 75**.

The Clinch River is a globally significant river. The Clinch River is home to more species of mussels than any other river in the world.[5] The river is home to 48 imperiled and vulnerable species of mussels and fish.[6] In addition, the river is home to rare plants, mammals, and birds. The Clinch River has been identified as the number-one hotspot in the United States for imperiled aquatic species. Due to the presence of endangered species, federal actions that adversely impact the endangered species, such as debris and sediment removal, must complete consultation under Section 7 of the Endangered Species Act (ESA). Prior to the protections by the ESA, residents reported more frequent cleaning and removal of debris and sediment from the river. While the importance of protecting endangered species is acknowledged, the associated restrictions and regulatory processes are a burden to resource-limited County staff and is believed to be an underlying reason for less active debris management programs. Understanding which debris-removal actions are allowed under the ESA and how to obtain permissions to take such actions requires time and expertise not currently had by county staff.

Debris within waterways is also a problem after a major flood, as fast-moving floodwaters pick up and carry not only woody debris and sediments, but structures, infrastructure, cars, and other personal property. This type of debris requires additional considerations as it may contain hazardous materials. In addition, separate regulations and funding opportunities exist around debris removal after an emergency event. Therefore, Emergency Debris Removal is considered as a separate action within the plan.

---

[5] "Clinch River", Virginia Department of Wildlife Resources, Clinch River | Virginia DWR

[6] "Clinch River", The Natural Conservancy, Clinch River (nature.org)

Figures of Problem Area

Figure 76: Example of debris captured on dam in North Tazewell

Project Type

Programmatic

Total Estimated Cost

Unavailable

Estimated Time to Complete

Ongoing Program

Project Lead

Tazewell County

Action Description

The County needs a mechanism in place to routinely remove debris and sediment while maintaining compliance with ESA and other environmental requirements, as there are streams in the County designated as critical habitat for endangered species. If needed, the County should hire contractors to increase staff capacity for debris removal. Contractors could include program administration, crews for debris removal, or environmental permitting experts. The mechanism for *emergency debris removal* will vary and is broken out into a separate action.

The routine debris and sediment removal program should have short-term and long-term goals. In the short-term, the focus should be on understanding the mechanisms needed to remove debris and sediment. The County should focus on clearing debris that is captured on infrastructure and removing sediment that is blocking the flow of the stream. For example, many culverts throughout the County are filled with sediment which worsens flooding by limiting the capacity of the culvert. Prior to removing debris, the location should also be evaluated for long-term solutions. While debris removal is necessary in some parts of the County from years of buildup on infrastructure, repeated routine debris removal from the same locations is expensive and damaging to the environment. The County should focus on solving the long-term problem by resizing infrastructure to accommodate seasonal flow and debris delivery. The long-term focus should be reducing the sources of unnatural debris and sediment through actions such as studies to identify sources of debris and sediment, strengthening sediment and erosion control ordinances, increasing staff capacity to support enforcement, and resizing infrastructure to accommodate seasonal flow and debris delivery.

There are several mechanisms that can be utilized to obtain proper environmental permits to remove debris and sediment. Additionally, the best process may be determined by owner of the infrastructure. For example, VDOT may already have routine procedures and permitting to remove debris from VDOT structures utilizing a Nationwide Permit and/or Programmatic Agreements. The proposed steps outline the recommended approach for the Routine Debris and Sediment Removal Program. However, the U.S. Fish and Wildlife Service (FWS), U.S. Army Corps of Engineers (USACE), and Virginia Department of Transportation (VDOT) should be engaged throughout this process to identify the most streamlined process.

For removal of debris and sediment, it is recommended that the County develop a *Habitat Conservation Plan (HCP)* including procedures for debris and sediment removal under *Section 10 of the Endangered Species Act*. An HCP is a planning document designed to accommodate economic development to the extent possible by authorizing the limited and unintentional take of listed species when it occurs incidental to otherwise lawful activities.[7] The plan is designed help landowners and communities while providing long-term benefits to species and their habitats. HCPs describe the anticipated effects of the proposed taking, how those impacts will be minimized or mitigated, and how the conservation measures included in the plan will be funded.

If the FWS finds an HCP meets the specified criteria, it issues an incidental take permit. This allows the permit holder to proceed with an activity that could otherwise result in the unlawful take of a listed species. The benefits of the HCP include creating set procedures for actions within the river to balance conservation with flood risk reduction, available grant funding, agency coordination, and provisions for routine and emergency debris removal. In addition, the procedures within the HCP are set for the life of the HCP even if some ESA requirements change. HCPs may cover both listed and unlisted species. For example, if the regulatory status of an unlisted species changes during the term of the HCP, the obligations of the applicant do not.

[7] "Habitat Conservation Plans", U.S. Fish & Wildlife Service, [Habitat Conservation Plans | U.S. Fish & Wildlife Service (fws.gov)]

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources
Short-term Goals				
1	**Identify Staffing –** Recommend the County identify staff to manage and champion the Routine Debris and Sediment Removal Program. If staff does not have the capacity, the County should hire a consultant to lead the effort. The consultant could fill multiple roles identified through the	0-1 years	County Staff Time	
2	**Identify Priority Areas –** Recommend the County identify priority areas for debris and sediment removal throughout the County. The Community should be engaged throughout the process to provide input. By identifying priority areas, the County can develop goals for each year of the program	0-1 years		
3	**Agency Coordination –** There are several potential paths to obtain permits for removing debris and sediment within Tazewell County. The County should set up an initial engagement meeting with VDOT staff to understand Nationwide Permits held by VDOT. For structures owned by VDOT, there may already be a process in place for debris removal. If VDOT does not hold permits, the County may need to pursue a Nationwide Permit which will include notification of FWS with each action. The County should set up initial engagement meetings with FWS to present the proposed approach before moving forward with developing a Habitat Conservation Plan (HCP)	1-3 months	County Staff Time	
4	**Secure Funding for an HCP –** The County should pursue funding to develop the HCP. FWS has funds to help communities establish HCP through its Cooperative			
5	**Develop HCP –** The County should hire a consultant to prepare the HCP. Throughout the plan, the County should coordinate with FWS to ensure all Section 10 requirements of the ESA are met. Once the plan is completed, FWS will evaluate the plan to ensure it meets NEPA and HCP requirements to issue an incidental take permit.	1-2 years	\$50,000 - \$200,000	Cooperative Endangered Species Conservation Fund – Conservation Planning

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
6	**Remove Debris and Sediment following HCP –** Once FWS issues an incidental take permit, the County can being work in accordance with the HCP and permit requirements. The County should hire a contractor to remove debris and sediment in accordance with the HCP and incidental take permit. It is important to note, violating the terms of the incidental take permit may constitute unlawful take under ESA. When removing the debris, the County should also evaluate sites that routinely capture debris. Removing	As Needed	Dependent on flood event	Section 165 of the Water Resources Development Act of 2020
7	**Maintain Program –** The program should be run on an ongoing basis including activities such as identifying priority areas, coordinating with FWS, removing debris and sediment, and resizing infrastructure as funding is available. Additionally, the HCP and incidental take permit will have	Ongoing		
Long-Term Goals				
8	**Field Review –** The County should hire a geomorphologist to perform a preliminary field visit. The geomorphologist should spend a few days reviewing hotspots for sedimentation provided by the County. Based on the field observations, the geomorphologist should make	3-6 months		
9	**Study Source of Sedimentation –** Based on the recommendations of the geomorphologist, the County should have a study of the sedimentation sources prepared. The study should consider sedimentation sources such as streambank erosion, logging, agriculture, and others as recommended by the geomorphologist. The study should identify sources of sediment and make recommendations for limiting sedimentation if there is unnatural or increased sedimentation identified. Recommendation may include	1-2 years		
10	**Strengthen Sediment and Erosion Control Ordinances –** Based on feedback from the community, it is believed that human activities are causing increased sedimentation. As recommended by the proposed study in Step 9, the County should work to strengthen the Sediment and Erosion Control Ordinance (e.g., requirements that go beyond	6-12 months	County staff time	
11	**Increase Staffing Capacity for Enforcement and Review -** As recommended by the proposed study in Step 9, the County should increase staffing capacity to better enforce the Sediment and Erosion Control Ordinance. This could include hiring consultants to perform permit review or hiring inspectors for enforcement. The staff should also	Ongoing		

Funding Sources

- See Table

Figure of Action

- N/A

Develop Emergency Debris Management Program

PRIORITY ACTION

Problem Description

Floods create a significant amount of natural and man-made debris within the stream such as trees, cars, unsecured property, and pieces of buildings and infrastructure. In the last 161 years, there have been 42 damaging flood events in Tazewell County. Since 2020, there have been seven floods within Tazewell County as discussed in *Section 4 – Existing Conditions Summary* and *Section 6 - Risk Assessment*. Residents have reported issues with debris build up that reduces flow capacities within streams and worsens flooding. Debris can also damage infrastructure and property. Residents reported that there used to be more frequent cleaning up of debris and sediment in the river following flood events. Residents reported receiving minimal assistance with removing debris. Additionally, compounding debris in streams from previous flood events worsens future flooding.

As discussed throughout the plan, the Clinch River is home to many endangered species. Due to the presence of endangered species, actions that potentially impact the species such as debris and sediment removal must meet the specifications of the Endangered Species Act (ESA). Prior to the protections by the ESA, residents reported more frequent routine cleaning up of debris and sediment in the river. County staff has limited capacity and has not been able to implement procedures to meet the ESA requirements to allow for debris and sediment removal. Special conditions/procedures may apply after an emergency flood event to allow for expedited removal of debris with respect to ESA compliance. Flood events exhaust staff capacity which limits the ability of staff to focus on debris removal after flood events. Additionally, when there is a Presidential disaster declaration, there are more sources of funding and assistance for debris removal, such as funding available through FEMA Public Assistance. Currently, staff does not have capacity to fully leverage available assistance.

Figures of Problem Area

N/A

Project Type

Programmatic

Total Estimated Cost

Unavailable

Estimated Time to Complete

Ongoing Program

Project Lead

Tazewell County

Action Description

Debris build-up is an ongoing issue in Tazewell County that worsens flooding. Additionally, to remove debris the County must navigate the proper approvals due to the presence of protected species. This action includes the creation of an Emergency Debris Management Program by establishing set procedures and permits for debris removal in streams, hiring a disaster recovery services contractor to supplement county staff, and updating the Tazewell County Emergency Operations Plans Debris Management Support Annex. A disaster recovery services contractor can assist in the acquisition and administration of grants. A disaster recovery services contractor can also assist with the procurement and management of services such as debris removal.

One of the largest disaster recovery federal programs is the Federal Emergency Management Agency (FEMA) Public Assistance (PA) Program, as authorized by section 406 of the Stafford Act. All FEMA PA funds come with an additional 5% for management costs (Category Z), which most local governments use to pay the disaster recovery services contractor. FEMA also provides additional funding as part of the PA program for hazard mitigation, so that recovery projects using PA funds are more sustainable and resilient in the face of future, similar disasters. Finally, once FEMA PA funds are totaled, a percentage of those funds may be added and given to the state to manage and fund other types of hazard mitigation projects as part of the Hazard Mitigation Grant Program (HMGP) as authorized by section 404 of the Stafford Act. It should be noted that communities that have an Emergency Debris Management Plan in place typically have higher reimbursement rates through the FEMA PA program. Hiring a disaster recovery services contractor can help Tazewell County clear debris following flood events and leverage available federal funding for recovery. This action should be pursued in conjunction with the *Routine Debris and Sediment Removal Program*. All these proposed steps should be performed in advance of flood events to help the County be prepared to actively respond.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost	Potential Funding Sources (By
1	**Hire a Disaster Recovery Services Contractor** – Throughout the plan, there have been several actions that could include support from the Disaster Recovery Services Contractor. The County should identify the specific roles and expectations for the Disaster Recovery Services Contractor and hire a firm to fill the role. The County should reach out to the VA SHMO to see if any PA funds are still available to support initial tasks for the Disaster Recovery Services Contractor. The Disaster Recovery Services Contractor can assist the County by: • Managing Public Assistance and other recovery grant applications and administration. • Guiding the County in submitting applications to fund debris removal (or for reimbursements), pump station repairs, road and culvert repairs and other recovery projects. Recovery contractors may be paid with a portion of the 5% administration costs that accompany FEMA grants. • Meeting with FEMA Program Delivery Manager (PDMG) and establish what meetings (Recovery Scoping Meeting) have occurred and deadlines for project submittal. Discussing options for debris removal and stream restoration, including the Natural Resources Conservation Service (NRCS) and United States Army Corps of Engineers (USACE) management of debris removal projects and stream restoration. • Completing the Damage Inventory (DI), including a detailed inventory of debris associated with the			• County operating funds • PA Management Costs • NRCS Emergency Watershed Protection (EWP) funds • USACE Direct Federal Assistance (DFA) • Federal Operations Support (FOS) • Mission Assignments
2	**Agency Coordination -** There are several potential paths to obtain permits for emergency debris removal. The County should set up an initial engagement meeting with VDOT staff to understand Nationwide Permits held by VDOT through USACE. For structures owned by VDOT, there may already be a process in place for debris removal. If VDOT does not hold permits, the County may need to pursue a Nationwide Permit which will include notification of FWS with each action. When a presidential disaster is declared, the USACE should be immediately requested to set up emergency debris removal utilizing Nationwide Permits.			

Step #	Step Description	Estimated Time to	Estimated Cost	Potential Funding Sources (By
3	**Acquire Nationwide 401 Permit for debris removal from non-VDOT owned infrastructure in the waterways –** The USACE issues Nationwide Permits that allow agencies to maintain their assets. Through coordination with VDOT, it should be confirmed that VDOT has and can utilize a Nationwide Permit to clear debris and sediment from VDOT assets post event. Tazewell County should obtain a Nationwide 404 permit to clear debris from assets not covered by VDOT debris removal. Due to the protected species in the Clinch River,			
4	**Include Emergency Debris Removal in Habitat Conservation Plan (HCP) –** As discussed in the *Routine Debris and Sediment Removal Program*, Tazewell County should include programmatic actions for emergency debris removal in the HCP. The plan should clearly outline actions to be taken with the Nationwide Permit and debris removal outside of infrastructure assets. By having clear approved procedures in advance of flood events, the County can expedite the acquisition of permits to remove debris post			

Ste p #	Step Description	Estimated Time to	Estimated Cost	Potential Funding Sources (By
5	**Amend Debris Management Support Annex (Tazewell County Emergency Operations Plan) -** The Tazewell County Emergency Operations Plan includes a Debris Management Support Annex to facilitate and coordinate the removal, collection, and disposal of debris following a disaster in order to mitigate against any potential threat to the health, safety, and welfare of the impacted citizens, expedite recovery efforts in the impacted area, and address any threat of significant damage to improved public or private property. Currently, the annex does not include specific provisions for debris removal from waterways after a flood event. The annex should include guidance for emergency removal of debris from waterways including: • Roles of County staff and Disaster Recovery Services Coordinator • The request process for debris assistance from USACE following a presidential disaster declaration. The County EM can request a USACE field assignment to remove debris when a Presidential Disaster Declaration has been made. • FEMA Trainings for County Staff assisting with Debris Management including IS-632.a (Introduction to Debris Operations) and IS-633 (Debris Management Plan Development) • Private contractors for debris removal • Resources needed for debris removal (e.g.,			

Funding Sources

- See Table

Figure of Action

N/A

Acquire Undeveloped Parcels

Problem Description

As discussed in the *Risk Assessment*, large portions of Tazewell County are at risk of flooding. Additionally, most of the development is near water features due to the flat topography along the valley bottoms. Development intensifies the magnitude and frequency of floods by increasing impermeable surfaces, amplifying the speed of drainage collection, reducing the carrying capacity of the land, and, occasionally, overwhelming sewer systems. Residents report rapid flooding with minimal warning time and high velocity floodwaters.

Figures of Problem Area

N/A

Project Type

Programmatic

Total Estimated Cost

Dependent on number of parcels identified and current market value.

Estimated Time to Complete

Ongoing Program

Project Lead

Tazewell County

Action Description

The County has expressed interest in acquiring parcels of undeveloped land within the floodplain to reduce and mitigate the impact of flooding by limiting future development in the floodplain and implementing flood storage areas. Parcels should be selected upstream of high-risk flood areas to capture, store, and slow the velocity of the channel flow. To serve as flood storage, the parcels may require minor grading, wetland restoration, stream restoration, the construction of nature-based solutions or the construction of flood storage basins. While serving as natural flood storage, the parcels can also serve as public amenities such as natural areas or parks with recreation facilities, hiking trails, or canoe access points. When acquired for flood storage, sites may need additional studies to evaluate storage capacities, flood risk reductions, and needs for nature-based solutions or restoration. Sites identified for public amenities, nature-based solutions, or storage basins may require additional planning, design, and construction.

At a minimum, the following actions should be taken at each site:

- Acquisition of property and development rights
- Restriction of future development
- Long-term maintenance plan development

In addition, the following actions should be considered for each site:

- Investigative or planning level studies
- Required permitting needs
- Stream and or wetland restoration
- Nature Based Solution installation for flood storage
- Flood storage basins
- Conversion to a public amenity (walking trails, natural areas, recreation facilities, etc.)
- Mitigation banking
- Long-term stewardship

Throughout the engagement process, several areas were identified as potential sites to be acquired for flood storage.

Areas identified for potential flood storage include:

- Parcels upstream of North Tazewell
- Parcels near the Four Way Area in Tazewell
- Parcels upstream of Richlands

When identifying funding sources for acquisition, restoration, and construction the County should pursue several opportunities. There are a wide variety of grants available for activities such as stream restoration, wetland restoration, and public recreation amenities. Sites with hard infrastructure solutions such as retention basins may not be eligible for grants focused on mitigation through nature-based solutions and restoration. The County should also consider public /private partnerships through options such as mitigation banks. Additionally, FWS provides Habitat Conservation Plan Land Acquisition Grants through the Cooperative Endangered Species Conservation Fund Grants. These funds can be utilized to acquire land to complement mitigation in areas with approved Habitat Conservations Plans. These funds could be leveraged upon the completion of the Habitat Conservation Plan as recommended in the *Routine Debris and Sediment Removal Program*.

Undeveloped parcels in flood hazard areas for North Tazewell and Richlands are shown in **Figure 76** and **Figure 77**. The total government owned undeveloped areas within flood hazard areas are summarized in **Table 71**.

Table 71: Government Owned Undeveloped Parcels within Flood Hazard Areas

Flood Hazard Area	Undeveloped Area (Acres)
Floodway	127
100-Year Flood Zone	3318
500-Year Flood Zone	32

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Property Identification –** Recommend the County develop a priority matrix that identifies priority acquisition properties based on selection criteria. Depending on the goals of the County, a study may need to be determined to understand which parcels would best reduce flood risk by serving as flood storage. The County should also identify the actions to be implemented at each site. For example, in some sites the goal may just be to acquire the site and restrict future development. Other sites may be used for flood storage		County Staff or Consultant Time	• BRIC Capability and Capacity Building
2	**Pursue Funding –** Once the County has identified priority sites and the actions to implement at each site, the County should pursue funding for the actions. Depending on the funding sources, actions may be taken one site at a time or through groupings of sites. When pursuing BRIC funds, the County should pursue larger flood mitigation actions including the			
3	**Acquisition –** Recommend the County acquire the prioritized sites and development rights to the sites. The County should restrict future development on the sites.			• BRIC • CFPF • Cooperative Endangered Species Conservation
4	**Design & Permitting–** Depending on the site, further design and permitting may be needed for flood storage, nature-based solutions, stream restoration, and public amenities. The County should hire qualified consultants as needed for design			• Community Challenge • BRIC • Five Star and Urban Waters Restoration

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
5	**Implementation –** Once the design is complete, the project may be bid, and a qualified contractor selected to implement the action at each site.			• Outdoor Recreation Legacy Partnership (ORLP) Land and Water Conservation Fund • Rivers, Trails, and Conservation Assistance (RTCA) • Transportation Alternatives Program (TAP) • Community Flood Preparedness Fund (CFPF) • Recreational Trails Program • Virginia Land Conservation Fund • Section 319(h) Nonpoint Source (NPS) Implementation Program • Stormwater Local
6	**Maintenance –** Depending on the selected solution, routine maintenance may be needed. A plan for maintenance should be made including maintenance frequency,			• County Operating Funds

Funding Sources

- See Table

Figure of Action

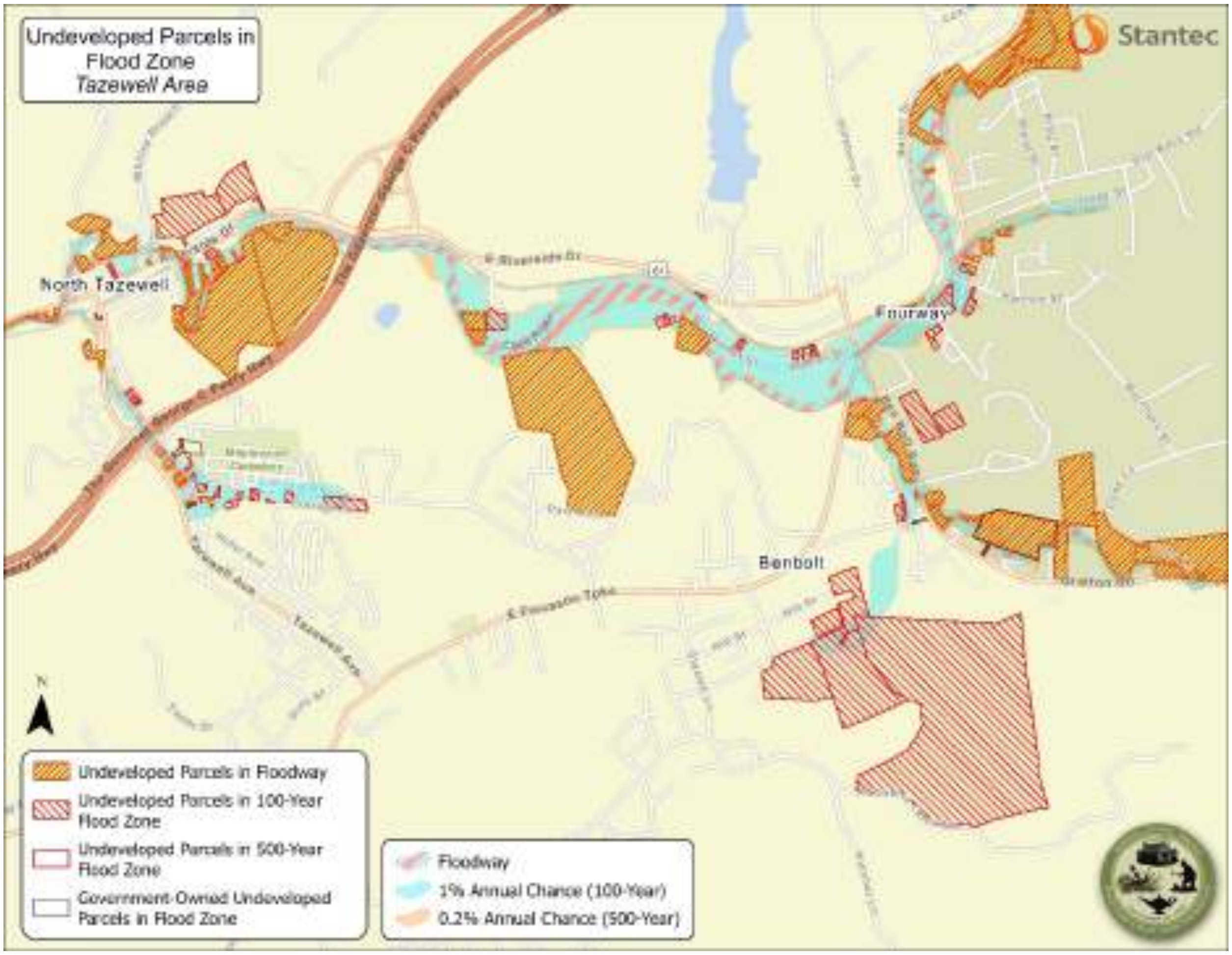


Figure 77 Undeveloped Parcels in Flood Hazard Areas in Tazewell

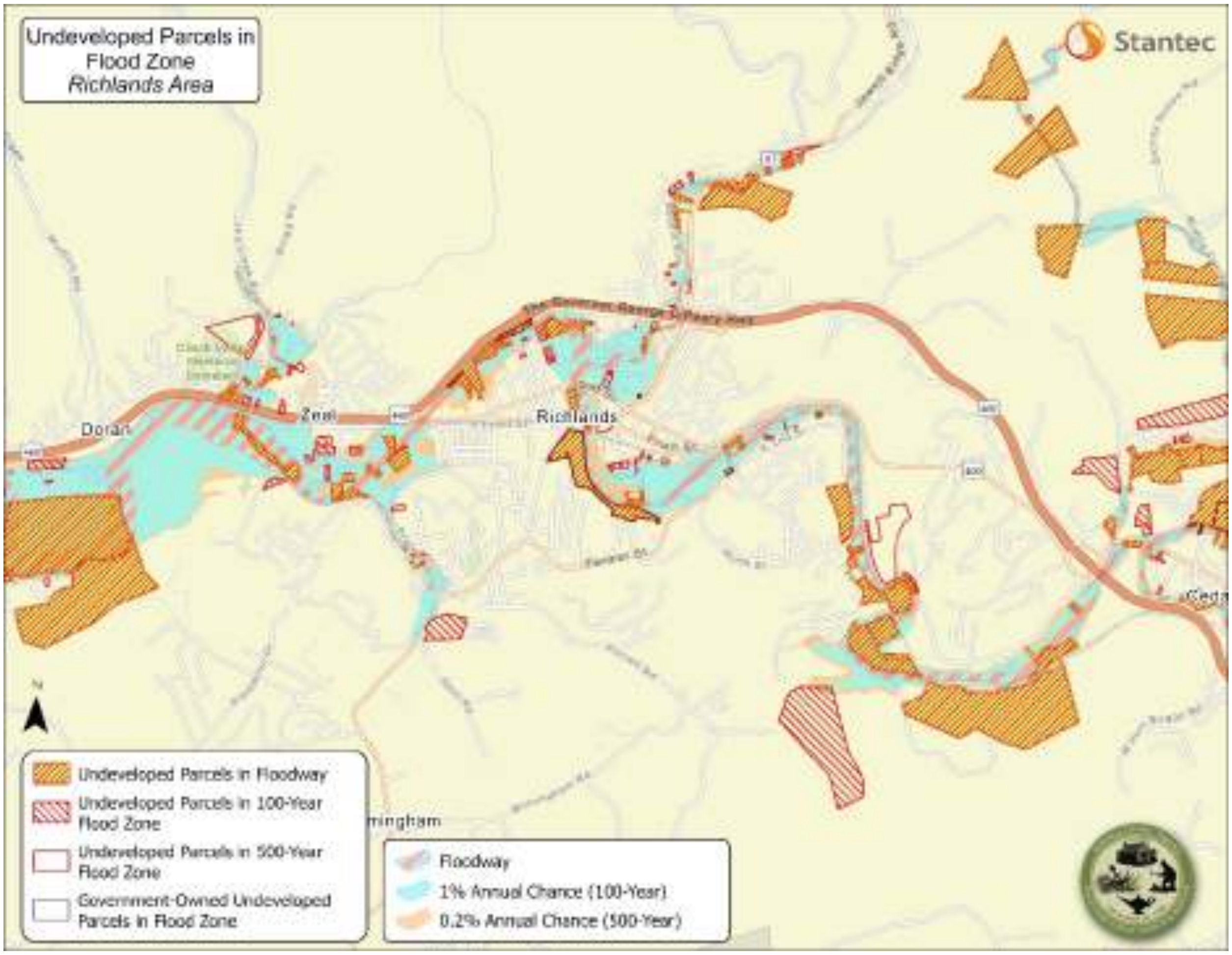


Figure 78: Undeveloped Parcels in Flood Hazard Areas in Richlands

Acquire Developed Properties

Problem Description

Tazewell County has a large number of structures located within the floodplain, as described in the *Risk Assessment*. Many of these structures were built prior to floodplain management ordinances. Development intensifies the magnitude and frequency of floods by increasing impermeable surfaces, amplifying the speed of drainage collection, reducing the carrying capacity of the land, and, occasionally, overwhelming sewer systems. Development within the floodplain puts people, property, and infrastructure at higher risk of negative impacts from flooding as shown in **Figure 78** and **Figure 79** . Additionally, many of the structures located within the floodplain are mobile homes that have higher vulnerability to flooding. Residents with high social vulnerability or without flood insurance may be unable to afford repairs to their homes and are more likely to continue to live in their homes. Tazewell County also has several residential areas that are only accessible by a single access point which strands a large number of residents and cuts-off emergency services when flooded.

Figures of Problem Area

Figure 79: Bottom Road Area during February 2020 floods (Source: Donna Whittington)

Figure 710: Allegheny Street Area during February 2020 floods (Source: WOAY TV)

Project Type
Programmatic

Total Estimated Cost
Dependent on the number of properties acquired and current market value.

Estimated Time to Complete
Ongoing Program

Project Lead
Tazewell County

Action Description
Tazewell County should develop a program to acquire properties based on prioritization located within the floodway and high hazard areas of the mapped FEMA floodplain to return to natural areas. **Priority should be given to severe / repetitive loss properties, mobile homes, abandoned buildings, properties in the floodplain or 100-year floodplain, and areas cut-off from emergency services during flooding events.** While acquisition may be pursued one property at a time, a focus should be placed on buying out multiple properties where applicable to minimize flood risk. The acquisition of property will minimize flood risk by providing opportunities within the floodway or floodplain for incorporation of flood storage (including natural or nature-based solutions) and limiting future development.

Once acquired, structures on the property should be demolished and the site should be restored to natural area. Natural areas may also be utilized for public recreation. To serve as flood storage, the parcels may require minor grading, wetland restoration, stream restoration, and or the construction of nature-based solutions. While serving as natural flood storage, the parcels can also serve as public amenities such as natural areas and parks with recreation facilities, hiking trails, and or canoe access points. When acquired for flood storage, sites may need additional studies to evaluate storage capacities, flood risk reductions, and needs for nature-based solutions or restoration. Sites identified for public amenities or nature-based solutions may require additional planning, design, and construction. Sites with hard infrastructure solutions such as retention basins may not be eligible for grants focused on mitigation through nature-based solutions and restoration.

At a minimum, the following actions should be taken at each site:

- Acquisition of property and development rights
- Demolition of existing structures
- Restriction of future development
- Long-term maintenance plan development

In addition, the following actions should be considered for each site:

- Investigative or planning level studies.
- Required permitting needs
- Stream or wetland restoration
- Conversion to a public amenity (walking trails, natural areas, recreation facilities, etc.)
- Nature Based Solution installation for flood storage.
- Mitigation banking
- Long-term stewardship

When pursuing acquisition, the program should consider community engagement, equity, and affordable housing. Residents should be engaged throughout the process to understand their options, rights, and risk. Some property owners may require additional assistance to relocate beyond the value they are given for their home or as renters. The County should consider additional funding sources and support to ensure residents are relocated outside of the floodplain and flood risk areas. Additional support may include moving assistance, site development for relocated communities, and housing assistance. For communities that want to remain together, the County may need to provide assistance to help residents relocate to an area together.

Priority areas identified throughout this plan include:

- Blacksburg Street, North Tazewell
- Bottom Road/ Kirby Road Area, Raven
- Allegheny Street Area, Richlands
- Page Street Area, Richlands
- Four Way Area, North Tazewell
- Reynolds Avenue Area, Bluefield including Dudley Street and Mobile Estates/ Magnolia Lane

These areas were identified throughout the planning process which included public engagement and a desktop risk assessment. Other areas should be considered if they meet the program goals. Additional studies may need to be performed to acquire grant funding for property acquisition, demolition and restoration. This program should remain ongoing until the number of structures within flood hazard areas is reduced to zero and as funding and opportunities become available. Examples of acquisition and demolition properties being turned into a public park are shown in **Figure 711** and **Figure 712**.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
1	**Establish Program –** Recommend the County identify staff to lead the program and champion the effort. The County should work to acquire properties on an ongoing basis as funding becomes available. Staff should be trained on funding sources for acquisition, demolition, and restoration. If existing staff does not have the capacity, the County may			
2	**Community Engagement –** Recommend the County hold public meetings with the identified priority communities to receive feedback on potential acquisition projects.		County Staff Time	
3	**Property Identification –** Recommend the County identify priority properties to acquire and demolish through a prioritization matrix based on selected criteria. Depending on the goals of the County, a study may be needed to understand which parcels would best reduce flood risk by serving as flood storage (natural flood storage or nature-based infrastructure). The County should identify the actions to be			• HMGP Advanced Assistance • BRIC Project Scoping
4	**Pursue Funding –** Once the County has identified priority sites and the actions to implement at each site, recommend the County pursue funding for the actions. Depending on the funding sources, actions may be taken one site at a time or through groupings of sites. For pursuing larger grant opportunities such as HMGP or BRIC, a consultant or disaster recovery services coordinator may be beneficial to prepare the		$50,000 + for BRIC application prepared by a consultant	
5	**Acquisition / Demolition –** Recommend the County acquire the prioritized sites and development rights to the sites. The County should restrict future development on the sites. The County should coordinate with residents to ensure a streamlined process and		County Staff Time, funding for acquisition	• BRIC • CFPF • FMA • CBDG (housing development) • HMGP

Step #	Step Description	Estimated Time to Complete	Estimated Cost (By Step)	Potential Funding Sources (By Step)
6	**Design & Permitting–** Depending on the actions selected for the sites, further design and permitting may be needed for flood storage, nature-based solutions, stream restoration, and public amenities. The County should hire consultants as needed for design and permitting on the acquired properties. Most grants are focused on stream restoration for natural flood storage. If the County decided to pursue hard infrastructure solutions for			• Community Challenge • BRIC • Five Star and Urban Waters Restoration • Outdoor Recreation Legacy Partnership (ORLP) Land and Water Conservation Fund • Rivers, Trails and Conservation Assistance (RTCA) • CFPF • Recreational Trails Program • Virginia Land Conservation Fund • FMA • Section 319(h) Nonpoint Source (NPS) Implementation
7	**Implementation –** Once the design is complete, a contractor can be hired to implement the action at each site.			
8	**Maintenance –** Depending on the selected solution, routine maintenance may be needed. A plan for maintenance should be made including maintenance frequency, actions			• County operating Funds

Funding Sources

- See Table

Figure of Action

Figure 711: Example of open space post property acquisition/demolition due to flooding (California Neighborhood Louisville, Kentucky).

Figure 712:Example of a park being developed on previously acquired properties from flooding in the California Neighborhood, Louisville, Kentucky[8]

[8] "Alberta O. Jones Park", Parks Alliance of Louisville, [Alberta O. Jones Park | Parks Alliance of Louisville (parksalliancelou.org)](parksalliancelou.org)

Participate in Community Rating System (CRS)

Problem Description

Within Tazewell County, there are a large number of structures location in Flood Hazard Areas as discussed in *Section 6 - Risk Assessment*. There are 387 structures in the Floodway, 1,996 in the 1% Annual Chance Flood Hazard Area, and 525 in the 0.2% Annual Chance Flood Hazard Area. While Tazewell County participates in National Floodplain Insurance Program (NFIP), many residents report that flood insurance premiums are cost prohibitive. Without flood insurance, residents may be fully responsible for flood-related damage to their property. Flood damage can be extremely expensive. One inch of floodwater can cause up to $25,000 in damage.[9]

Figures of Problem Area

N/A

Project Type

Programmatic

Total Estimated Cost

Staff time. Additional costs associated with developing flood management planning (e.g., hiring a consultant to develop a plan, write an ordinance, or verify CRS prerequisites are met) may apply.

Estimated Time to Complete

Ongoing Program

Project Lead

Tazewell County

Action Description

Under the Community Rating System (CRS), communities are rewarded for exceeding the minimum national standards for floodplain management. Under the CRS, the flood insurance premiums of a community's residents and businesses can be discounted to reflect the community's work to reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, preserve and /or restore natural functions of floodplains, help insurance agencies obtain flood data, and help people obtain flood insurance. Participating communities achieve certain classes that are associated with a specific discount on residents' premiums. The discounts by CRS class are shown in **Figure 713.**[10]

[9] "Flood Insurance", FEMA, Flood Insurance | FEMA.gov

[10] "National Flood Insurance Program Community Rating System Coordinator's Manual", FEMA, 2017, CRS Coordinator's Manual (fema.gov)

CRS classes, credit points, and premium discounts			
CRS Class	Credit Points (cT)	Premium Reduction	
		In SFHA	Outside SFHA
1	4,500+	45%	10%
2	4,000–4,499	40%	10%
3	3,500–3,999	35%	10%
4	3,000–3,499	30%	10%
5	2,500–2,999	25%	10%
6	2,000–2,499	20%	10%
7	1,500–1,999	15%	5%
8	1,000–1,499	10%	5%
9	500–999	5%	5%
10	0–499	0	0

SFHA: Zones A, AE, A1–A30, V, V1–V30, AO, and AH

Outside the SFHA: Zones X, B, C, A99, AR, and D

Preferred Risk Policies are not eligible for CRS premium discounts because they already have premiums lower than other policies. Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage.

Some minus-rated policies may not be eligible for CRS premium discounts.

Premium discounts are subject to change.

Figure 713: CRS classes, credit points, and premium discounts

To help lower the cost of flood insurance in Tazewell County, the goal of this action is to start participating in CRS. While communities can continue to earn more credits, an initial goal is to achieve CRS Class 9 which would result in a 5% insurance premium discount. The process to join the CRS is described in the Coordinator's Manual and summarized below. The steps reference the 2017 Coordinator's Manual, however, when applying the community should reference the latest manual as they are updated every few years.

Flood Risk Mitigation Actions from this plan including the activities performed for the completion of this plan may be leveraged for CRS Credit. For example, increased flood modeling actions may be leveraged under Activity 410 – Flood Hazard Mapping. Additionally, the Tazewell County Flood Resilience Plan may be leveraged for Activity 510 – Floodplain Management Planning with the addition of a few components. As the community pursues and implements the Flood Risk Mitigation Actions in the Tazewell County Flood Resilience Plan, the community should check if the activities meet any CRS credits.

Steps (step #, step description, timeline, estimated cost)

Step #	Step Description	Estimated Cost	Potential Funding
	Initial Classification		
1	**Meet Prerequisites** - To become and continue to be a Class 9 or better, a community must demonstrate that it has enough points to warrant the class AND meet the following six prerequisites. Below the prerequisites are summarized. The community should verify that the Class 9 prerequisites are met as defined in the Coordinator's Manual. 1. The community must have been in the Regular Phase of the NFIP for at least one year. 2. The community must be in full compliance with the minimum requirements of the NFIP. This must be verified by the FEMA Regional Office within 6 months of the initial CRS verification visit. 3. The community must maintain FEMA Elevation Certificates on all new buildings and substantial improvements constructed in the Special Flood Hazard Area (SFHA) after the community applies for CRS credit. 4. If there are one or more repetitive loss properties in the community, the community must take certain actions. These include reviewing and updating the list of repetitive loss properties, mapping repetitive loss areas, describing the causes of the losses, and sending an outreach project to those areas each year. A community with 50 or more repetitive loss properties must take additional actions. 5. The community must maintain all flood insurance policies that it has been required to carry on properties owned by the		
2	**Submit Letter of Interest -** The community will submit a letter of interest to the FEMA Regional Office and copies will the sent to the State NFIP Coordinator and Insurance Services Office, Inc. (ISO). The contents required are shown in the Coordinator's Manual. The community will also include documentation showing that the community is implementing activities to warrant at least a CRS Class 9.		
3	**Submittal Review -** If the community's submittal is complete and shows that Class 9 is likely, the ISO Specialist will contact the FEMA Regional Office for approval to conduct an initial verification visit with the community. The Regional FEMA Office must approve the submittal to ensure that the community is in full compliance with the minimum floodplain		

Step #	Step Description	Estimated Cost	Potential Funding
4	**Prepare for Community Visit -** The ISO Specialist will contact the community to schedule the community verification. During the visit, the ISO/CRS Specialist will review all the communities' activities that may deserve credit. Prior to the visit, community staff will prepare		
5	**Community Visit -** ISO will perform the verification visit and submit a verification report to FEMA. The review period may take several months. FEMA will make the final decision on the community's credit and		
6	**Credit Set -** FEMA sets the CRS credit to be granted and notifies the community, the state, insurance companies, and other appropriate		
7	**Official Classification -** The classification becomes effective on May 1 or October 1, whichever comes first, after the community's activities are		
	Recertification (Each Year)		
1	**Staffing -** Designate a community CRS coordinator and maintain the position. The CRS coordinator should be responsible for recertification each year. The CRS coordinator should also be responsible for applying for additional credits as Tazewell County completes flood mitigation activities to gain further insurance premium discounts. The process for applying for additional credits is detailed in the Coordinators Manual. For example, the Class 6 prerequisites are summarized below, which would result in a 20% premium reduction for properties in Special Flood Hazard Areas. The Coordinator's Manual should be referenced for the full criteria. 1. The community must meet all the Class 9 prerequisites. 2. The community must have received and continue to maintain a classification of 5/5 or better under the Building Code Effectiveness Grading Schedule (BCEGS).		
2	**Recertification Packet** - ISO/CRS will send the community a list of credited activities. The community must respond by the deadline provided with the annual recertification package certifying whether it is still implementing each item on the list. The community will submit the package to the ISO / CRS Specialist. Some activities will require the		

Funding Sources

- See Table

Figure of Action

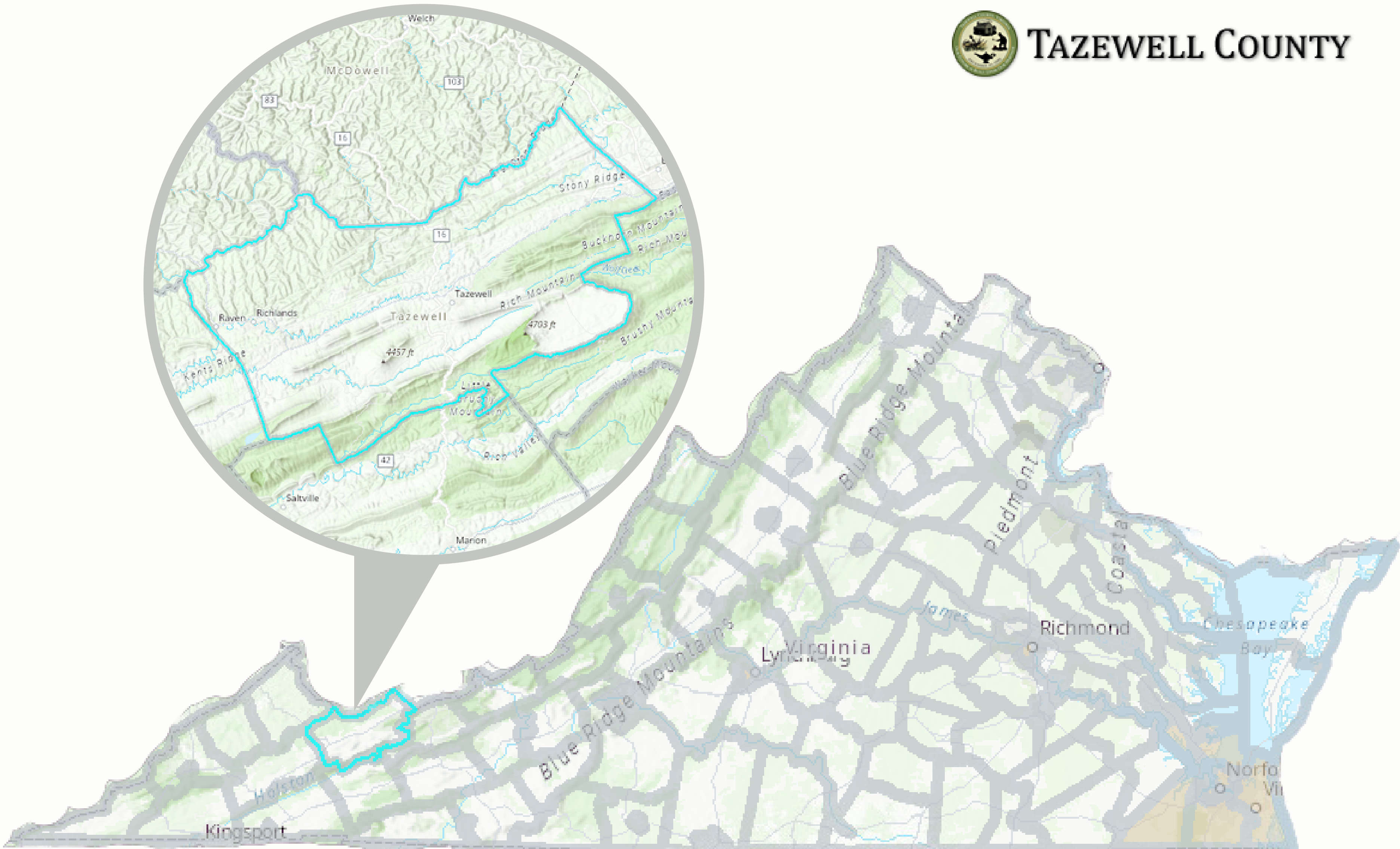
N/A

Plan Implementation and Maintenance

The actions included in this section are intended to provide a near-term roadmap for Tazewell County to implement flood risk reduction measures. Ongoing monitoring to evaluate flood mitigation actions that have been successfully implemented is recommended. Going forward, it is recommended that the Planning Team meet annually (at a minimum) to review progress on the flood mitigation measures and discuss flood mitigation implementation actions to be taken in the following year.

Further, while not required, it is recommended that the County update the Flood Resilience Plan every 5-10 years in order to reassess capability and capacity and flood risk and vulnerability, as well as understand the progress made toward implementation of actions identified during this planning process, and to identify new actions for flood risk reduction.

TAZEWELL COUNTY



CFPF Bottom Road Floodplain Study

Tazewell County, Virginia
81.8347°W 37.0921°N

Flood Hazard Area

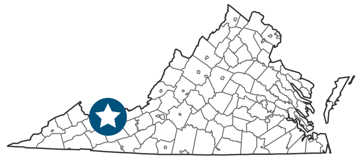
- 0.2% Annual Chance Flood Hazard
- 1% Annual Chance Flood Hazard
- Area Not Included
- Area of Minimal Flood Hazard
- Area of Undetermined Flood Hazard
- Area with Reduced Risk Due to Levee
- Open Water
- Regulatory Floodway
- Building Footprints within FP Study Area (522)

N

1 in = 1,000 ft when printed at 11x17"

0 200 400 600 800 1,000
Feet

Reference: Project limits are approximate. The property boundaries depicted on this map have not been surveyed and are for prospect assessment purposes only. This information is not to be used as final legal boundaries.
Data Source: Floodplain data from FEMA. Orthoimagery collected in Spring 2019, 2021 and 2022 (whichever is most recently available) by the VBMP program for Virginia.
Spatial Reference:
NAD 1983 StatePlane Virginia South FIPS 4502 Feet
Date Exported: 11/9/2023
Project Number: 107360



res
www.res.us

Cartographer: sleeper | POC: XXXX | Path: R:\Resgis\Projects\VA\107360_Tazewell_CFPF_Grants_2023\PRO\Grant_Proposal_Maps\Tazewell_Flood_Protection\Tazewell_CFPF.aprx | Layout: 107360 Bottom Rd FP Study 11x17

CFPF Bottom Road Flood Study

Watershed Map

Tazewell County, Virginia

81.6569°W 37.1406°N

NHD Flowlines

Drainage Area (179.10 Square Miles)

N

1 in = 2 mi when printed at 11x17"

0 0.5 1 1.5 2

Miles

<u>Reference:</u> Project limits are approximate. The property boundaries depicted on this map have not been surveyed and are for prospect assessment purposes only. This information is not to be used as final legal boundaries.

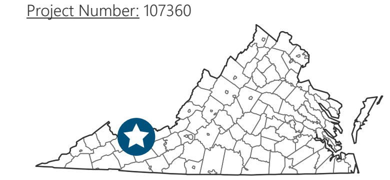
<u>Data Source:</u> Drainage Area from USGS Stream Stats (https://streamstats.usgs.gov/ss/). Orthoimagery collected in Spring 2019, 2021 and 2022 (whichever is most recently available) by the VBMP program for Virginia.

<u>Spatial Reference:</u>

NAD 1983 StatePlane Virginia South FIPS 4502 Feet

<u>Date Exported:</u> 10/25/2023

<u>Project Number:</u> 107360



res

www.res.us

Cartographer: sleeper | POC: JC | Path: R:\Resgis\Projects\VA\107360_Tazewell_CFPF_Grants_2023\PRO\Grant_Proposal_Maps\Tazewell_Flood_Protection\Tazewell_CFPF.aprx | Layout: 107360 Bottom Road FP Watershed 11x17

National Flood Hazard Layer FIRMette

FEMA

81°50'24"W 37°5'46"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

81°49'46"W 37°5'17"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) *Zone A, V, A99*
		With BFE or Depth *Zone AE, AO, AH, VE, AR*
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
		Future Conditions 1% Annual Chance Flood Hazard *Zone X*
		Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
		Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
		Effective LOMRs
		Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8	Coastal Transect
	513	Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/2/2023 at 2:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

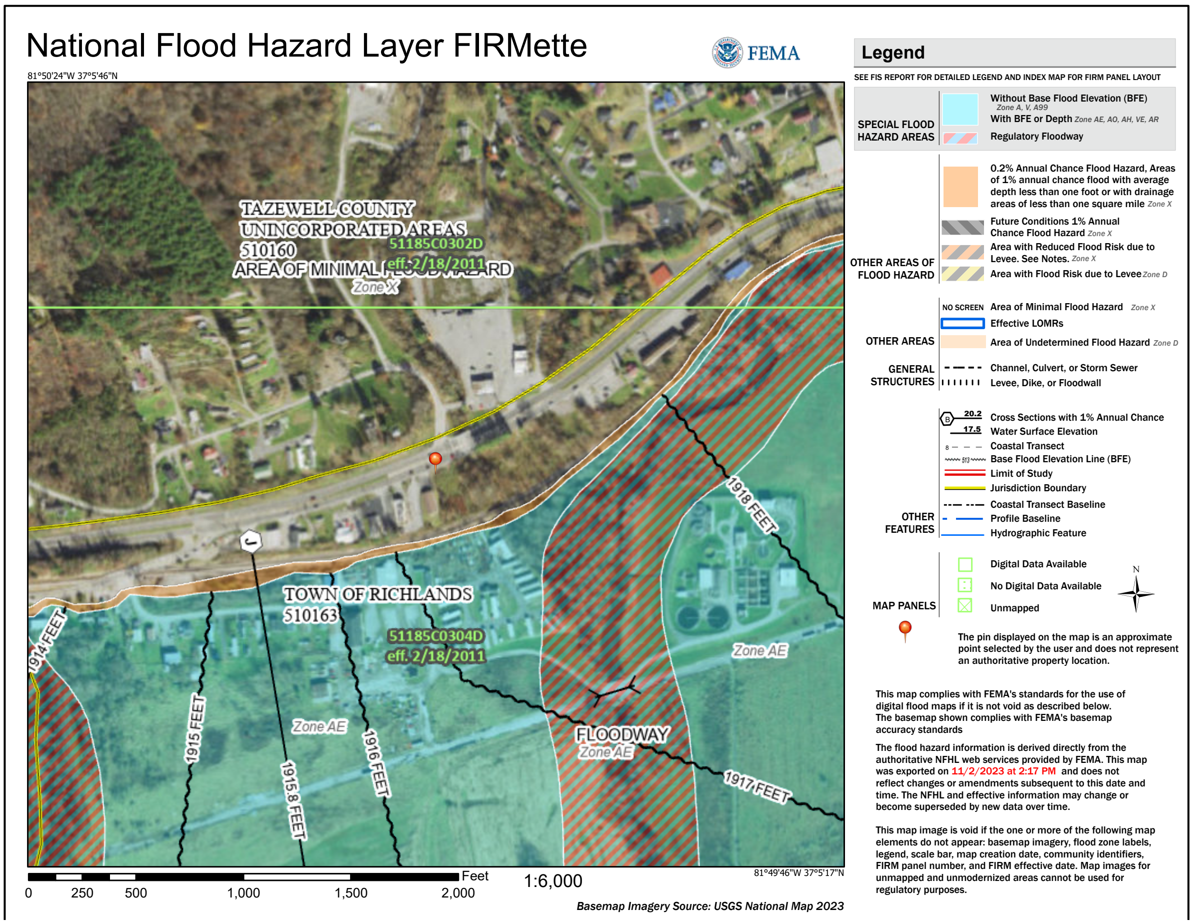
Tazewell County: Bottom Road Area Study

DCR CFPF Grant Application
November 12, 2023

Historic Flooding Data and Hydrologic Studies

The project area is within a mapped floodway and floodplain (Zone AE). The project area was last mapped on February 18, 2011, as shown in the Federal Emergency Management Agency (FEMA) FIRMette below (Figure 1).

Figure 1. FEMA FIRMette of the Project Area



In general, Tazewell County has an history of persistent flooding, which can be attributed to its mountainous terrain and the presence of smaller tributaries that feed into larger streams and rivers. The topography and high-water volume increase the risk of flash flooding. Since 1953, the County has experienced 21 presidential disaster declarations, encompassing severe storms, snowstorms, hurricanes, and floods. In recent years, the Town of Richlands has faced specific incidents of flooding that led to damage to infrastructure, property, and disruption of daily lives of its residents.

The data in Table 1 below was pulled from the Tazewell County Flood Resilience Plan and indicates forty-two historic flood events that took place in county. The listed events were documented in the Cumberland Plateau Planning District Commission (CPPDC) Hazard Mitigation Plan, National Centers for Environmental Information (NCEI) Storm Events Database, and/or presidential disaster declarations.

Table 1. Historic Flood in Tazewell County

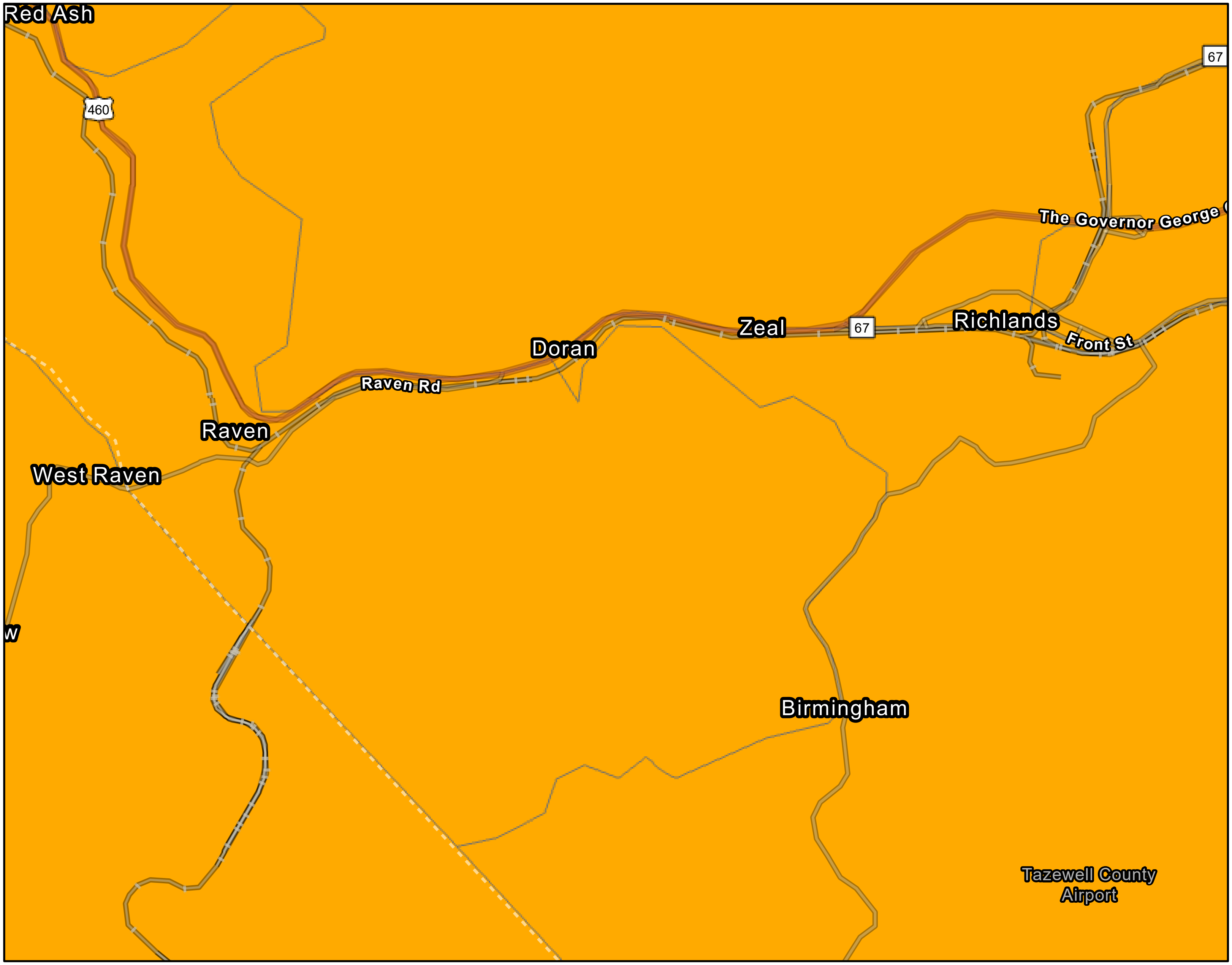
Occurrence	Location	Source(s)
February 22, 1862	Clinch River Area	CPPDC HMP
February 22, 1867	Clinch River Area	CPPDC HMP
June 22, 1901	Entire River	CPPDC HMP
March 1, 1902	Clinch River Area	CPPDC HMP
November 20, 1906	Clinch River Area	CPPDC HMP
June 14, 1907	Clinch River Area	CPPDC HMP
April 3, 1912	Clinch River Area	CPPDC HMP
April 1, 1913	Clinch River Area	CPPDC HMP
March 5, 1917	Lower Clinch Area	CPPDC HMP
January 29, 1918	Clinch River	CPPDC HMP
February 3, 1923	Clinch River	CPPDC HMP
June 13, 1923	Clinch River	CPPDC HMP
December 22, 1926	Clinch River Area	CPPDC HMP
August 14, 1940	Clinch River Basin	CPPDC HMP
January 30, 1957	Clinch River	CPPDC HMP
May 7, 1958	Clinch River	CPPDC HMP
March 12, 1963	Clinch River	CPPDC HMP
March 17, 1973	Clinch River Area	CPPDC HMP
January 26, 1978	Clinch River	CPPDC HMP
January 23, 2022	Wardell	NOAA/NCEI
March 18 2002	Countywide	NOAA/NCEI
February 16, 2003	Clinch River Area	CPPDC HMP
November 19, 2003	Countywide	NOAA/NCEI
February 28, 2011	McCall Place, Bandy, Adria, Richlands	NOAA/NCEI
April 26, 2012	Richlands	NOAA/NCEI
May 22, 2012	Bluefield	NOAA/NCEI
March 4, 2015	Red Ash	NOAA/NCEI
April 23, 2017	Raven	NOAA/NCEI

Occurrence	Location	Source(s)
June 16, 2017	Bluefield	NOAA/NCEI
February 11, 2018	Richlands	NOAA/NCEI
April 16, 2018	Cedar Bluff	NOAA/NCEI
September 10, 2018	Bluefield	NOAA/NCEI
December 21, 2018	Richlands	NOAA/NCEI
February 20, 2019	Bluefield, Cedar Bluff, Pisgah, Hockman	NOAA/NCEI
February 6, 2020	Countywide	State Declared Emergency, NOAA/NCEI
April 13, 2020	Pounding Mill	NOAA/NCEI
March 1, 2021	Richlands	NOAA/NCEI
January 2, 2022	Cedar Bluff	NOAA/NCEI
May 24, 2022	Falls Mills	NOAA/NCEI
July 12, 2022	Mouth of Laurel, Jewell Ridge, and Burkes Garden	NOAA/NCEI
August 5, 2022	Richlands	NOAA/NCEI
February 17, 2023	Countywide	Local News

Bottoms Road Area

Social Vulnerability Class

Moderate Social Vulnerability



November 9, 2023

Scale: 1:44,005

0 0.28 0.55 1.1 mi

0 0.42 0.85 1.7 km

William & Mary, Center for Coastal Resources Management (CCRM) at Virginia Institute of Marine Science (VIMS)
VGIN, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA
Maxar

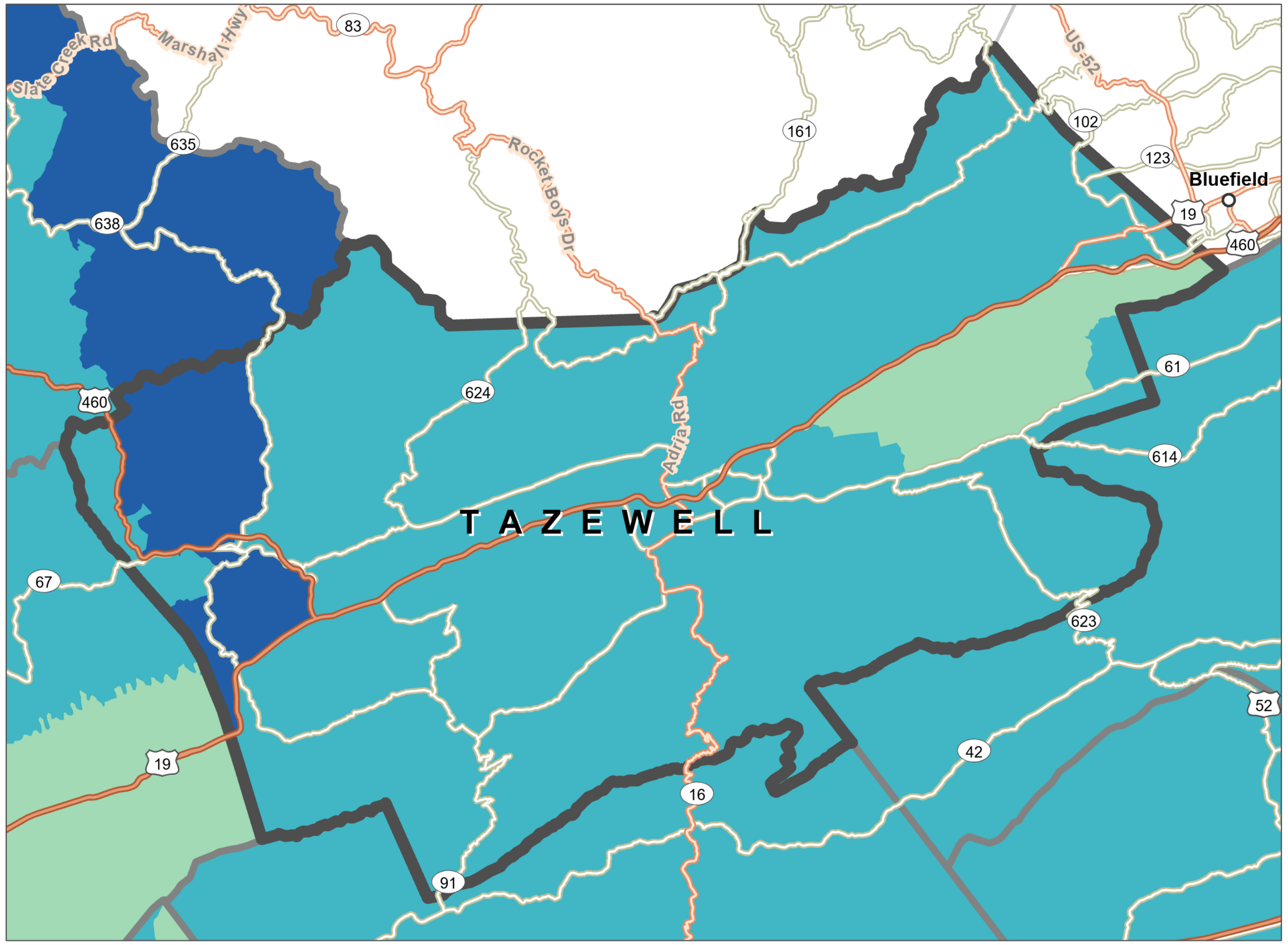
VIMS William & Mary Virginia Institute of Marine Science Center for Coastal Resources Management

ADAPT VA

CDC/ATSDR Social Vulnerability Index 2020

TAZEWELL COUNTY, VIRGINIA

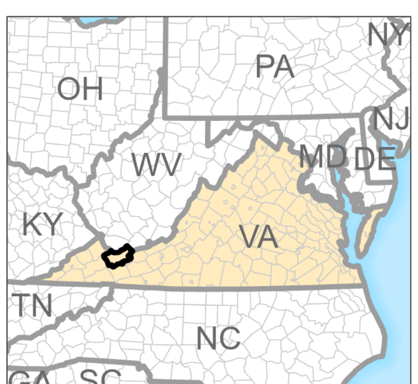
Overall Social Vulnerability[1]



Highest (Top 4th) | Vulnerability (SVI 2020)[2] | Lowest (Bottom 4th)

Data Unavailable[3]

0 1.5 3 6 9 Miles



Social vulnerability refers to a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human-caused threats, such as toxic chemical spills. The **CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI 2020)**[4] **County Map** depicts the social vulnerability of communities, at census tract level, within a specified county. CDC/ATSDR SVI 2020 groups **sixteen census-derived factors** into **four themes** that summarize the extent to which the area is socially vulnerable to disaster. The factors include economic data as well as data regarding education, family characteristics, housing, language ability, ethnicity, and vehicle access. Overall Social Vulnerability combines all the variables to provide a comprehensive assessment.

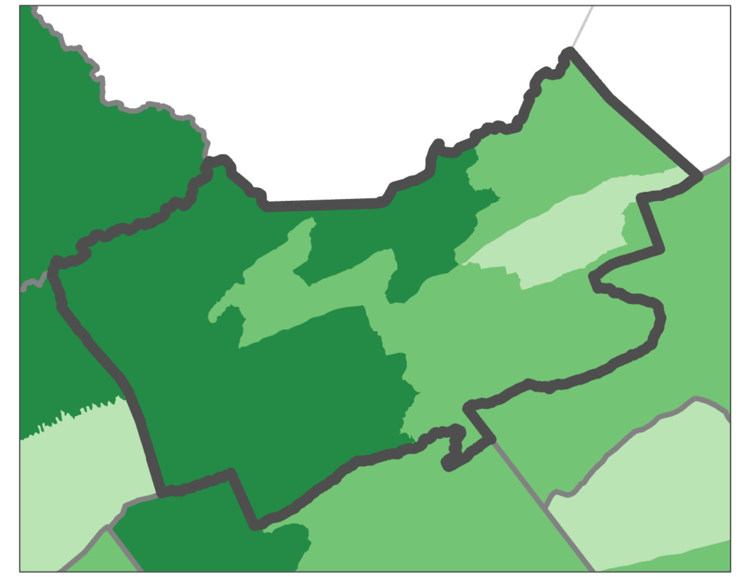
ATSDR Agency for Toxic Substances and Disease Registry

GRASP Geospatial Research, Analysis, and Services Program

DRAFT - FOR INTERNAL REVIEW ONLY

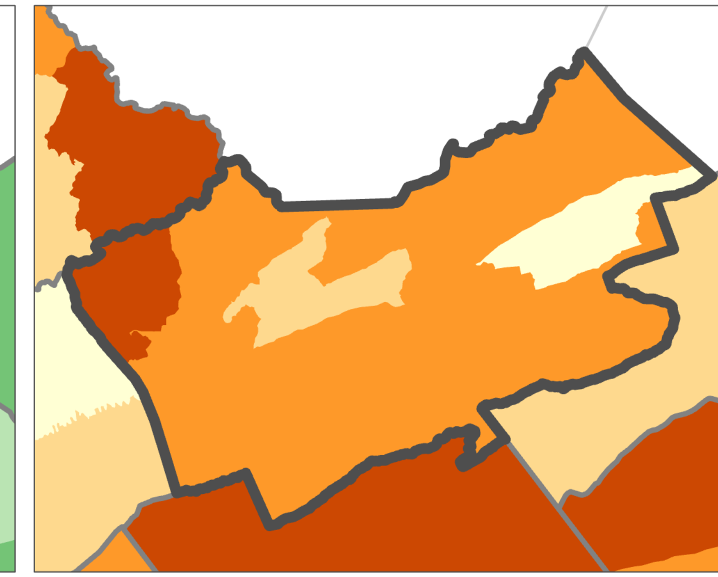
CDC/ATSDR SVI Themes

Socioeconomic Status[5]



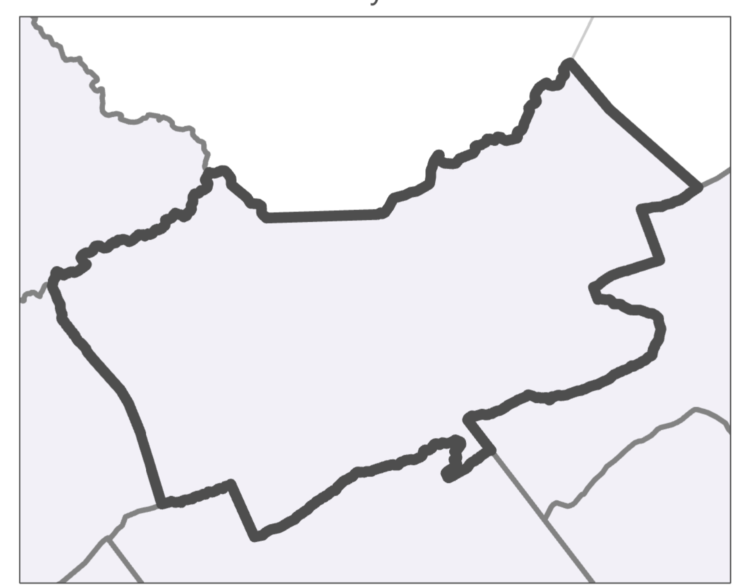
Highest (Top 4th) | Vulnerability (SVI 2020)[2] | Lowest (Bottom 4th)

Household Characteristics[6]



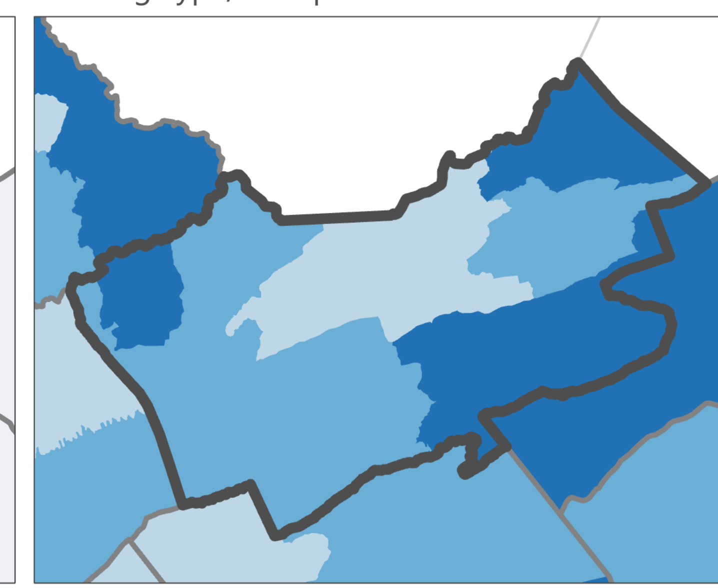
Highest (Top 4th) | Vulnerability (SVI 2020)[2] | Lowest (Bottom 4th)

Racial and Ethnic Minority Status[7]



Highest (Top 4th) | Vulnerability (SVI 2020)[2] | Lowest (Bottom 4th)

Housing Type/Transportation[8]



Highest (Top 4th) | Vulnerability (SVI 2020)[2] | Lowest (Bottom 4th)

Data Sources: [2]CDC/ATSDR/GRASP, U.S. Census Bureau, Esri® StreetMapTM Premium.

Notes: [1]Overall Social Vulnerability: All 16 variables. [3]Census tracts with 0 population. [4]The CDC/ATSDR SVI combines percentile rankings of US Census American Community Survey (ACS) 2016-2020 variables, for the state, at the census tract level. [5]Socioeconomic Status: Below 130% Poverty, Unemployed, Housing Costs-to-Income Ratio, No High School Diploma, No Health Insurance. [6]Household Characteristics: Aged 65 and Over, Aged 17 and Younger, Civilian with a Disability, Single-parent Household, English Language Proficiency. [7]Race/Ethnicity: Racial/ethnic Minority. [8]Housing Type/Transportation: Multi-unit, Mobile Homes, Crowding, No Vehicle, Group Quarters.

Projection: NAD 1983 Virginia Lambert.

References: Flanagan, B.E., et al., A Social Vulnerability Index for Disaster Management. *Journal of Homeland Security and Emergency Management*, 2011. 8(1). CDC/ATSDR SVI web page: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

DRAFT - FOR INTERNAL REVIEW ONLY

TAZEWELL COUNTY VIRGINIA

"Bound For Progress"

November 9, 2023

Matt Dalon
Virginia Department of Conservation and Recreation
Attention: Virginia Community Flood Preparedness Fund
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Mr. Dalon:

Thank you and the Department of Conservation and Recreation (DCR) for announcing the Community Flood Preparedness Fund (CFPF) round 4 grant manual offering grants and loans to support flood prevention and protection studies, planning, training, and implementation projects. The CFPF advances community-scale mitigation activities and nature-based solutions with a special focus on benefitting low-income communities.

As the Chair of the Tazewell County Board of Supervisors, I confirm that our Board supports these projects and the funding requested to increase flood protection across the County. In Tazewell County, local government entities, community-based organizations, and residents have become an engaged consortia fluent in flood safety. The County led research, engagement activities, and planning to develop the recently completed *Tazewell County Flood Resilience Plan* – a project funded by the CFPF. We appreciate the funding to prepare the plan and are now interested in funding to take action!

I understand Tazewell County is applying for grant funding for several projects:

- Richlands Elementary School BMP Design and Construction
- Blacksburg Street / Mill Dam Study
- Bottom Road Study
- Fire - Rescue Station 3 / Claypool Hill Study
- Bluefield Area Study

I support this grant application to build upon the recent collaboration and move toward implementation projects to increase safety and minimize flood damage.

Sincerely,

Shanna Plaster

Shanna Plaster
Chair, Board of Supervisors, Northwestern District

ROUND 4 CFPF GRANT APPLICATION

2023

VIRGINIA COMMUNITY FLOOD PREPAREDNESS FUND

BOTTOM ROAD AREA STUDY

TAZEWELL COUNTY, VIRGINIA
DECEMBER 20, 1799
OUR FUTURE IS BUILT UPON OUR HERITAGE

TAZEWELL COUNTY
COMMUNITY ID #510160

Introduction

Tazewell County (County) is applying for Virginia Community Flood Preparedness Fund assistance to perform the "**Bottom Road Area Study**," a study of the 930-acre Bottom Road Area (**Figures 1 and 2**) located roughly between and around the towns of Raven and Doran (near 190 Bottom Rd, Raven, VA 24639). The Bottom Road Area is **a peninsula surrounded by the Clinch River** and is one of the **more densely populated areas** in the County, which leads to **increased flood damage to property and safety hazards** for residents. As a recognized **low-income geographic area** with **moderate to high social vulnerability index scores**, the study will help to promote the health, safety, and welfare of all community members and businesses. Identified in the **2023 Tazewell County Flood Resilience Plan (a comprehensive, cohesive plan funded by the CFPF)**, the proposed study aims to identify a **long-term nature-based solution** based on **best available science** acknowledging the **consequences of climate change**. The solution selection process will **address socioeconomic inequities** to **enhance equity and be developed with transparency and input from the public**. Tazewell County respectfully requests assistance to perform a study of the Bottom Road Area to determine the cause of the flooding issues prior to investing in potential solutions. The County is requesting grant funding of **$194,144** at a 90%/10% cost share for a study in a low-income area. Tazewell County will provide 10% of the total cost of **$215,716** as the cost share via in-kind match from staff support for the project.

This grant application has been **authorized** by C. Eric Young, the Tazewell County Administrator, and **supported** by Shanna Plaster, the Chair of the Tazewell County Board of Supervisors.

Figure 1. Location Map of Tazewell County

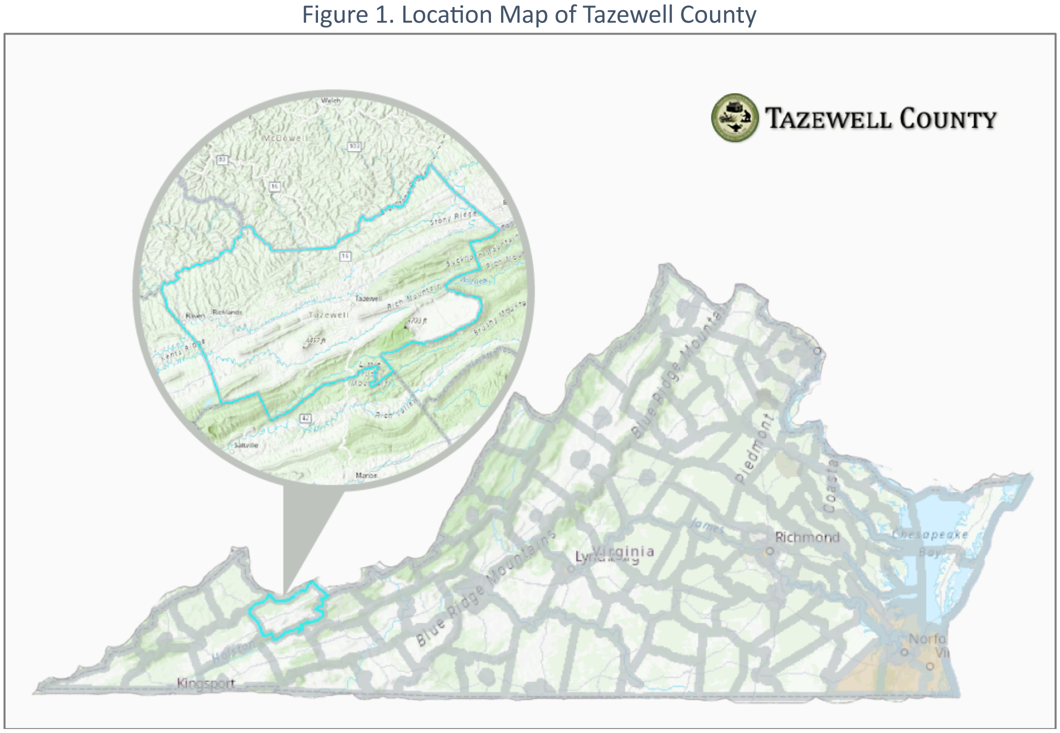
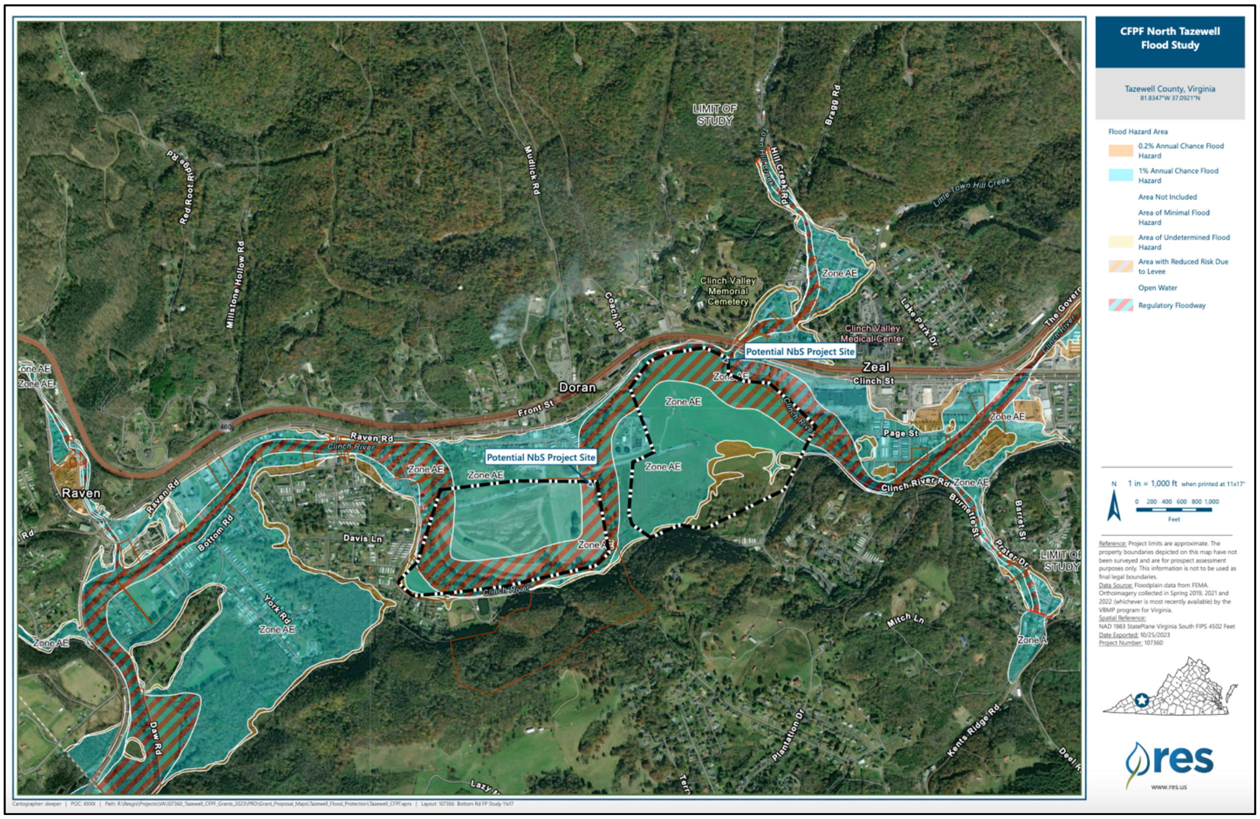


Figure 2. Map of Project Location



Needs and Problems

The 930-acre Bottom Road Area is located roughly between and around the towns of Raven and Doran. Raven is a census-designated place (CDP) in Russell and Tazewell counties in Virginia. The population was 2,270 at the 2010 census. Doran is an unincorporated community and CDP in Tazewell County. Doran has a post office with ZIP code 24612. It was first listed as a CDP in the 2020 census with a population of 113. Raven and Doran are located along the Clinch River, U.S. Route 460, and Virginia State Route 67 west of the Town of Richlands.

The Bottom Road Area faces **significant flooding challenges**. There are several factors that may be exacerbating flooding in the area:

- Residential homes in the area are located within the floodplain and were constructed prior to the County's flood ordinances.
- Many residents live in mobile homes, which are more vulnerable to flooding and its impacts.
- The Virginia Department of Transportation (VDOT) maintained concrete bridge located along Bottom Road is the main access point to a large residential area located within the floodplain and frequently overtops.

- Raven Road, which is used to access the VDOT maintained bridge and residential area, is prone to flooding and blocks the only available access for many residents.
- Residents reported increased floodwaters running onto adjacent properties following the upgrades to the VDOT maintained bridge.
- Residents reported water running up stormwater pipes during flooding events.

The **2023 Tazewell County Flood Resilience Plan** named the Bottom Road Area **a high priority area** as the community has suffered the greatest impacts from recent floods. As a continuation of the Flood Resilience Plan initiative and collaboration of the planning team, the study aligns well with the plan goals to understand flood risk, provide a pathway to uninterrupted primary public roadway access, increased public safety, and less flooding.

The Bottom Road Area Study is urgently needed as the next step in developing data sets necessary to determine solutions for protecting the local community from recurrent flooding and the highly impactful repercussions, up to and including loss of lives. Tazewell County flooding events can have far-reaching effects on the region. They can cause environmental damage, disrupt infrastructure, impact the economy, and pose risks to public health. The consequences of flooding highlight the importance of effective flood area studies, management strategies, including proper planning, improved drainage systems, and early warning systems to mitigate the impacts of such events.

Developing the data sets from this study to prevent the Bottom Road Area from flooding is crucial for the well-being and safety of the communities living in the local and surrounding areas. The following groups will benefit significantly from flood prevention measures:

Residents and Homeowners:

- **Property Damage and Los**s: Flooding can cause extensive damage to homes, businesses, and infrastructure, resulting in significant financial losses for residents and homeowners. By preventing floods, these individuals can protect their properties and avoid costly repairs, reconstruction or becoming unhoused.
- **Health Risks:** Floodwaters can harbor contaminants and diseases, posing serious health risks to people living in flooded areas. Preventing floods helps reduce the risk of waterborne illnesses and ensures a healthier environment for residents.
- **Psychological Impact:** Living in flood-prone areas can cause stress, anxiety, and fear among residents. By preventing floods, Tazewell County can reduce the community's psychological impact of living in a high-risk area.

Businesses and Economic Development:

- **Property Damage and Loss:** Like residents, businesses can suffer significant financial losses due to flooding. Preventing floods helps protect commercial properties and maintain economic stability in the area.

- **Disruption of Operations:** Flooding can disrupt business operations, causing losses in revenue and productivity. By preventing floods, Tazewell County businesses can minimize the risk of disruptions.
- **Attracting Investment:** Communities with effective flood prevention measures are more attractive to investors, as they offer a more stable and secure environment for businesses and residents. Tazewell County residents could significantly benefit from additional businesses and services.

Infrastructure and Public Services:

- **Infrastructure Damage:** Flooding has damaged critical infrastructure, such as roads, bridges, and utilities, leading to costly repairs and replacement in Tazewell County. Preventing floods helps maintain and extend the lifespan of these infrastructure assets.
- **Public Health and Safety:** Effective flood prevention measures can help protect public health and safety by reducing the risk of waterborne diseases and injuries.
- **Emergency Response:** By preventing floods, Tazewell County can reduce the need for additional emergency response measures in the future, such as evacuations and rescue operations, saving time, resources, and lives.

Environmental Conservation:

- **Ecosystem Preservation:** Flooding can damage or destroy ecosystems, threatening the survival of plant and animal species. Preventing floods helps preserve these ecosystems and maintain biodiversity.
- **Water Quality:** Flooding has contaminated Tazewell County's water sources, affecting both human and environmental health. By preventing future floods, they can maintain water quality and protect their water resources.
- **Climate Change Mitigation:** Effective flood prevention measures can help mitigate the impacts of climate change by reducing the risk of extreme weather events.

Thus, successfully preventing the Bottom Road Area of Tazewell County from flooding will benefit a wide range of groups, including residents, businesses, infrastructure, public services, and environmental conservation. By investing in effective flood prevention measures, the county can protect their assets, ensure public safety, and maintain a healthy and sustainable environment.

To do so, the Tazewell County will allocate staff resources to help plan and perform this study, which includes property owner communication. Before selecting solutions, preliminary engineering activities will take place. The study team will develop a Base Level Engineering (BLE) with a 2D hydraulic model coupled with a stormwater infrastructure hydraulic model to assess the problem areas and identify potential storage locations. An engineer will then review the existing data, perform a site visit to provide an initial assessment of the flooding issues, and advise the Town on implementation options.

Based on the identified target reduction volume and flow study, a stormwater engineer will identify three potential alternatives to reach the target reduction volume. The engineer will assess the viability of each option and provide a comparison of alternatives to assist with the selection. After reviewing the results of the study, potential projects for flood reduction to be designed, permitted, and construction will be identified.

Without the results of a study of the Bottom Road Area and implementation of mitigation measures based on findings, the recurrent flooding in this area will continue to threaten the safety of lives, property, and infrastructure and the environment in an area with a **population over 40,000 and a "moderate" to "high" Social Vulnerability.** Flooding under existing conditions presents a significant evacuation challenge as some residents do not own cars, do not drive, may have to transport medical equipment, may have to transport children, and need to relocate pets or animals. Additionally, residents may be concerned about leaving their property behind during the flood or being unable to actively respond to flooding of their homes.

The County has a median household income of $42,937. This is not greater than 80% of $80,615, the median household income in Virginia. Therefore, Tazewell County meets the definition for a **low-income geographic area**.

Over the years, flood events have become persistent in the County and in 2020, a flood event took place that was so severe the National Guard was called to perform lifesaving rescues (**Figures 3-5**).

Figure 3. Lifesaving efforts performed by the National Guard during 2020 floods.

Figure 4. Flood Debris from February 2020 flooding.

Figure 5. Bottom Road/Kirby Road during the February 6, 2020 flood.

Goals and Objectives

The three main goals and associated objectives for the Bottom Road Area Study are as follows:

Goal 1: Understand the root causes of recurrent flooding in the Bottom Road Area.

- **Objective 1a:** Conduct a comprehensive hydrologic study using **best available science** and accounting for the **consequences of climate change** to analyze the specific factors contributing to flooding in the Bottom Road Area.
- **Objective 1b:** Implement 2D BLE Hydraulic Modeling to accurately visualize and understand the complex nature of flooding in the study area.

Goal 2: Identify specific problem areas for further detailed studies.

- **Objective 2a:** Develop a detailed flood risk assessment to identify the most vulnerable areas within the Bottom Road Area in a manner that is **transparent and allows for public input.**

Goal 3: Develop effective flood mitigation strategies to minimize property damage and loss of life focused on **community-wide solutions**.

- **Objective 3a:** Identify a set of at least three mitigation strategies that are tailored to the Bottom Road Area.
- **Objective 3b:** Integrate sustainable and **nature-based solutions**, such as green infrastructure, into the proposed flood mitigation strategies.
- **Objective 3c:** Develop a document with study findings that include the potential mitigation strategies.

In summary, these goals and objectives aim to guide development of an action plan that reduces flood risk equitably through coordinated projects, informed by data, and emphasizing nature-based solutions.

Work Plan

TASK 1: TOWN PLANNING AND COMMUNICATION
Estimated Time: 2 Months

Tazewell County will procure a design consultant team with qualifications to successfully complete the work, including **engineering (PE) and floodplain management (CFM) credentials**. The consultant will engage with Town staff to determine roles and responsibilities for planning and public outreach activities. **Outreach activities** will allow for dialogue with property owners, residents, and stakeholders to ensure all are informed of measures planned and taken to improve local flood hazard resilience. **outreach efforts** with a **targeted focus on reaching low-income, socially vulnerable, and other disadvantaged or previously un-engaged groups** to **address socioeconomic inequities** and **enhance equity.**

Deliverable: Consultant contract, list of stakeholders, and engagement plan

TASK 2: HYDROLOGIC STUDY
Estimated Time: 2 Months

The consultant will perform a preliminary hydrologic study in accordance with the **best available science** and **future climate change projections** to identify a target reduction volume for the improvements. Tazewell County has areas at risk to karst, or land made up of limestone at risk of sinkholes, and additional surveys and/or soil assessments may be needed. The main activities associated with a hydrologic study include data collection, modeling, analysis, and assessment with special attention on the tributaries that convey through the problem area to the Clinch River.

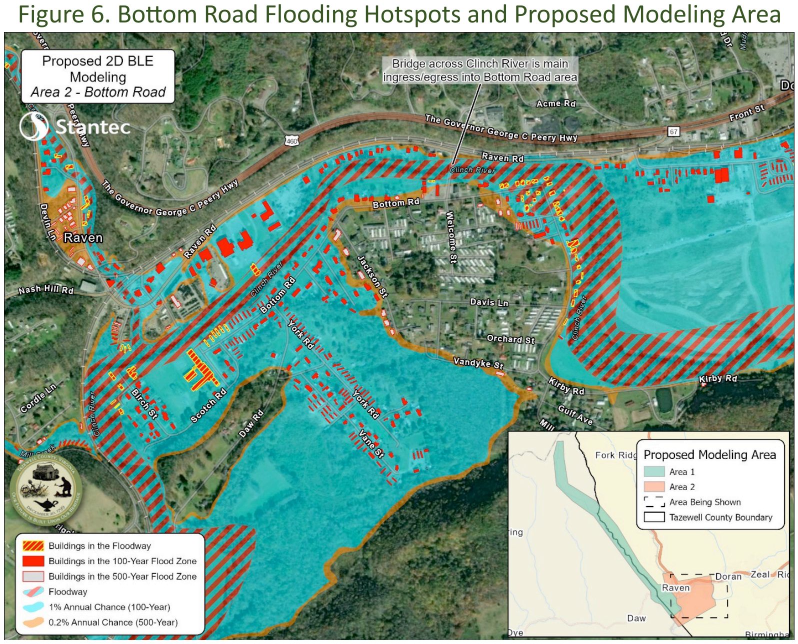
Deliverable: Hydrologic Study Summary of Findings

TASK 3: BASELINE 2D BLE MODEL
Estimated Time: 3 Months

The consultant will complete a 2D BLE to better understand the existing flooding and will assist in determining the stormwater solution (Figure 6). 2D BLE hydraulic modeling is an emerging type of modeling that has many benefits. 2D BLE models are developed using lidar data to visualize the entire area for a community-wide perspective and solution. The use of lidar data allows for better integration of both overland and underground structures, multi-directional water flow, and velocity visualization. 2D BLE models show the interaction of the modeled area with both riverine flooding and stormwater flooding. For areas with complicated flooding issues, 2D BLE models allow for a more detailed understanding of the flooding occurring and the factors influencing it.

Deliverable: 2D BLE Model Results with Flow Pattern and Impoundment Mapping

Figure 6. Bottom Road Flooding Hotspots and Proposed Modeling Area



TASK 4: STUDY OF EXISTING CONDITIONS
Estimated Time: 2 Months

The consultant will perform a comprehensive study of existing floodplain conditions and the level of threat to residents, critical infrastructure, and the environment. All data collected will be summarized into an existing conditions assessment. The assessment will allow the consultant to better understand topography of the area, locate the source of flooding concerns, and determine potential stormwater solutions for implementation.

Deliverable: Updated Flood Study Map; Existing Conditions Assessment Documentation

TASK 5: ALTERNATIVE REVIEW
Estimated Time: 3 Months

Based on the identified target reduction volume and flow study, the consultant, including the Certified Floodplain Manager, will identify three alternatives to reach the target reduction volume. The consultant will assess the viability of each option and provide a comparison of the alternatives to assist the County, Town, and community with selection.

Deliverable: Alternatives Comparison Summary

TASK 6: COMMUNICATE AND DOCUMENT RESULTS
Estimated Time: 2 Months

The consultant will identify potential projects for flood reduction to be designed, permitted, and constructed, targeting possible mining company lands or Dominion Aquacultural property for possible nature-based solutions projects.

Deliverable: Final Report

Evaluation

The indicators of success of the Bottom Road Area Study center include the following:

- **Stakeholder and Community Engagement:** The successful implementation of this study involves consistent community engagement with stakeholders and community members to ensure they are engaged throughout the study process and their input is considered during the identification of the potential solution.

- **Completion of Preliminary Hydrologic Study:** The successful completion of the preliminary hydrologic study to identify target reduction volume is important to determining appropriate solutions.

- **Development of BLE and 2D Hydrology Model:** The successful development of a BLE 2D Hydrology Model is essential to assess the existing flood risk and determining a list of potential solutions.

- **Evaluation of Alternative Solutions:** The successful evaluation of at least three alternatives for reaching the target reduction volume, with a detailed assessment of the feasibility of each option will assist with selecting the most effective solution to mitigating flood risk for the area.

- **Identification of Potential Project and Flood Reduction**: The successful identification of potential projects for flood reduction that can be designed, permitted, and constructed will help to ensure that flooding impacts are reduced in the Bottom Road area.

- **Compliance with Project Timeline and Budget:** Success can be measured by assessing the project's adherence to the outlined timeline and budget. This can be determined by monitoring the completing of various tasks within the stipulated timeframes and comparing the actual project costs with the budget allocated for each task.

The following data points will be collected and used to measure success:

- **Hydrological Data:** Collecting data on water levels, flow rates, and precipitation patterns in the area will allow the engineer to determine the existing conditions and impact flooding in the area.

- **Geospatial Data:** Information on the topography and elevation of the area will allow the engineer to determine how water flows and accumulates during flooding events, as well as how the changes in the landscape affect flood risk.

- **Stakeholder and Community Engagement Data:** Collecting data on feedback, input, and concerns from stakeholders and community members throughout the planning and implementation process is important to ensure their needs and priorities are considered and addressed. This data will also help to measure the success of the study.

- **Flood Incidents Data:** A record of previous and future flooding incidents in the Bottom Road Area will help to evaluate the effectiveness of the potential implemented flood risk reduction measures.

- **Project Timeline and Budget Data:** Monitoring the timeline and expenses associated with the study will help to ensure the study stays on schedule and within budget.

Through the analysis of this collected data, the project management team can understand the success of the project, which ensures the effective mitigation of flooding issues and improvement of resilience in the Richlands community.

Cost effectiveness will be ensured by the County's use of competitive procurement and the project partners' experience and knowledge of market costs for nature-based projects such as the proposed.

Potential products, services, meetings, and outreach efforts that may be conducted to ensure the success of the study includes but is not limited to, public meetings and workshops, information materials, stakeholder engagement, engineering services, and progress reports and updates. These efforts will help to evaluate the effectiveness of the study and ensuring that all tasks are completed.

To ensure that the proposed study meets the requirements of the agreement and is delivered on time the following can be used to monitor its progress:

- Timeline and milestones to ensure all deliverables are met within the agreed upon timeframe.
- Regular progress meetings with project team to review the status of the study.
- Communication plan with all project team members, locality staff, and other stakeholders to ensure effective communication and clear understanding out roles and responsibilities.
- Quality control measures to ensure all deliverables meet the required standards and specifications.
- Contingency planning to prepare for any unforeseen delays or findings that may affect the progress of the study.
- Stakeholder and community feedback to ensure the Bottom Road Area community members can provide input and express concerns.

When these elements are incorporated into the project monitoring plan, any potential delays or challenges that arise can be addressed and utilized to modify or improve the outcomes and deliverables. Regular assessment of progress will ensure that project objectives are being met.

ATTACHMENTS

As required, in addition to this Scope of Work, the funding application package includes information provided in the online submittal form and the following attachments:

- Budget Narrative
- Detailed map of the project area
- FIRMette of the project area
- Historic Flooding data and Hydrologic Studies
- Social Vulnerability Index
- Hazard Mitigation Plan
- Comprehensive Plan
- Floodplain Ordinance
- Resilience Plan
- Authorization to request funding and Ability to Provide Share of Cost
- Letter of Support

Budget Narrative

The following budget narrative provides a detailed breakdown of the tasks and estimated costs associated with the Bottom Road Area Study in Tazewell County, Virginia, aligning with the scope of work narrative.

Estimated total project cost:

A detailed cost breakdown for all seven project tasks is provided in Table 1, below.

Table 1. Cost Breakdown

Task #	Task Name	Grant Cost	County Cost	Total Cost
1	Town Planning and Communication	$ 10,220.00	$7,308.96	$ 22,959.60
2	Baseline and Initial Conditions Review	$ 25,324.00	$ 9,225.40	$ 34,549.40
3	Hydrologic Study	$ 34,412.00	$ -	$ 34,412.00
4	Baseline 2D BLE Model	$ 36,940.00	$ -	$ 36,940.00
5	Study Existing Conditions	$ 25,284.00	$ -	$ 25,284.00
6	Alternative Review	$ 42,044.00	$ -	$ 42,044.00
7	Communicate and Document Results	$ 19,920.00	$ 5,037.20	$ 19,526.56
	Total	***$ 194,144***	***$ 21,572***	***$ 215,716***

Funds Requested from the Fund

Tazewell County is requesting a total of **$194,144 (90%** of total project cost estimate) in funding over the proposed period of performance. The funding will support the implementation of the detailed work plan and scope outlined in the Scope of Work Narrative.

Amount of Funds Available

The study serves a low-income area, so the required match is 10%. County staff will support tasks 1, 2, and 6 at the County's expense, for an estimated in-kind value of based on staff labor salaries for the County Administrator, Engineering Director, Engineering Tech, and GIS Tech of **$21,572 (10%).**

Authorization to Request for Funding

Please refer to supporting documentation: Ability to Provide Share of Cost and Letter of Evidence of Match Funds. This documentation from the County authorizes the funding request.

Repetitive Loss and/or Severe Repetitive Loss

There are no repetitive loss and/or severe repetitive loss structures in the study area.