

# Virginia Cave Owners'



NEWSLETTER

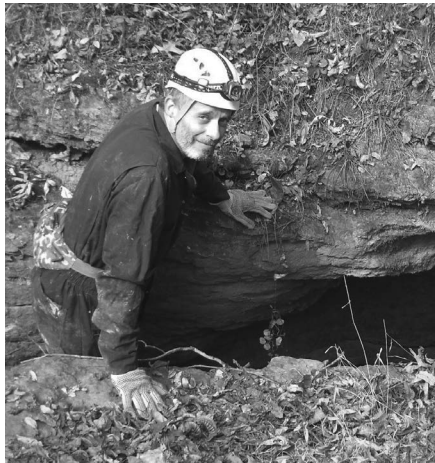
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## A Message From the Chair

As the new chair of the Virginia Cave Board, I would like to introduce myself to all Virginia cave owners who receive this newsletter. I have served as a member of the Cave Board since first being appointed in 2012 and was elected to serve as chair in February 2022. I'm a lifelong caver, and my interest in caves was one of several factors that led me into a career as a professional geologist. I currently hold the title of Senior Geologist and Karst Subject Matter Expert with Terracon Consultants, a nationwide geotechnical consulting firm, and am the first member of the VCB to represent the professional geotechnical realm since my appointment. I am a nationally certified professional geologist, and also a professional soil scientist licensed by the Commonwealth of Virginia.

I chaired my first meeting at Natural Bridge State Park on June 4, 2022. We were honored to have in attendance at that meeting the newly appointed

director of the Virginia Department of Environmental Quality, Michael Rolband; Evan Branosky, Chief Stormwater Policy Advisor, DEQ; and Matthew Wells, Director of the Virginia Department of Conservation and Recreation. It is of note that DEQ is currently conducting



Robert K. Denton Jr.

Stakeholder Advisory Group (SAG) meetings regarding a major revision of the Virginia Stormwater and Erosion and Sediment Control Guidance Manuals, and for the first time, karst conditions will be thoroughly addressed in the new guidance documents. This will be a critical factor in protecting not just caves, but also the karst aquifer and subterranean environment.

This past year has been somewhat of a challenge for VCB, as we've had two vacancies that needed to be filled and with members having scheduling conflicts, we've had a difficult time obtaining a quorum at our meetings. As a result, our next meeting was delayed until January 7, 2023, and was held at Shenandoah Caverns. The Cave Board members were privileged to be given a private tour of this beautifully decorated cave by the general manager, Joe Proctor.

There are a number of important projects the VCB is currently advising on. One of these is a proposed revamp of the lighting system in the Caverns at Natural Bridge to reduce the growth of algae (so called "lampenflora") that discolor the cave's formations. We are also initiating the process of revising the criteria that are used to determine a cave's significance and the need for conservation and protection of the designated caves. VCB is also providing input to the aforementioned DEQ SAG through our DCR representative, Wil Orndorff.

I'd like to close by ensuring our cave owners that although I represent private industry, my goal has always been to protect and conserve our precious and unique cave and karst resources, in particular the karst aquifer, which serves as the source of drinking water for so many of our communities as well as private homeowners throughout the karst terrain of Virginia. If any of the cave owners across the state have any concerns or questions, please don't hesitate to contact me directly, and I will bring your concerns to the VCB.

Robert K. Denton Jr., Virginia Cave Board

## Table of Contents

- 1 A Message From the Chair
- 2 U-ROCKS Rocks!
- 3 18<sup>th</sup> International Congress of Speleology
- 3 New License Plate: Explore Virginia Caves
- 4 Sinkhole Cleanups
- 4 Virginia Cave Week

### A Publication of the Virginia Cave Board

Due to generous grants from The Robertson Association and the Cave Conservancy of the Virginias, the Virginia Cave Board is pleased to continue offering a printed version of the *Virginia Cave Owners' Newsletter*. We hope you enjoy reading it. We'd love to hear from you regarding this issue and ideas for future issues.



For more information, please contact the Virginia Department of Conservation and Recreation, Virginia Natural Heritage Program, 600 E. Main St., 24th Fl., Richmond, VA 23219, or one of the members of the Virginia Cave Board: Robert K. Denton Jr., chair; Dr. Daniel H. Doctor, vice chair; Jason H. Carter; John H.H. Graves; Dr. John T. Haynes; Russell Kohrs; Richard Lambert; Allen L. Louderback; Meredith Hall Weberg; Roger W. Kirchen (ex-officio).

# U-ROCKS Rocks!

By Dr. R Shane McGary, Assistant Professor of Geophysics, Department of Geology and Environmental Science, James Madison University



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*The inaugural cohort of U-ROCKS students in front of a shield formation at Grand Caverns.*

*From left to right:*

***Rear:** Veronika Yurchenko, Spencer Schmidt, Peter Manos, Shamsuddin Ahmed, Shane McGary (PI)*

***Front:** Catherine Lau, Dereje Carl, Alondra Valle-Hernandez, Z.A. Williams, Lilly Smith, Hannah Hitchcock, Angel Garcia (Co-PI)*

The inaugural season of U-ROCKS (Undergraduate Research Opportunities in Cave and Karst Science) is in the books, and we want to reflect on the successes and challenges — mostly successes! — of the first year.

U-ROCKS is a National Science Foundation (NSF) funded Research Experience for Undergraduates (REU) program administered by faculty from James Madison University (JMU) and the University of Puerto Rico at Arecibo. The program supports 10 students for 10 weeks during the summer with the primary focus on individually mentored independent research projects. The REU student experience includes attending scientific presentations by cave and karst experts, personal and professional development workshops, and the building of a learning community through peer mentoring and social activities, all of which are directed by experienced faculty mentoring.

While each student was involved in individual research projects, we wanted to emphasize the team building and collaboration that is such an important part of scientific work. To this end, we set up activities for the students to attend together — some of their favorites included the JMU team challenge ropes course and a canoe trip down the Shenandoah River. They also organized field trips on their own, including a trip to D.C., a renaissance festival and a trip to Natural Bridge State Park. We felt the success of our team-building efforts when the eight REU students who presented their work at the national Geological Society of America (GSA) meeting in Denver organized a dinner together while there, sending us (the mentor group) a photo over WhatsApp.

In addition to poster presentations at a symposium at the end of the REU, nine of our students presented seven posters and five talks at three different national conferences, and produced four publications (three with student first-authors). Several of

the students continue to work on their projects and with their mentors, with more abstracts and publications on the horizon. The NSF program director specifically called out the depth and breadth of the work that the students had accomplished.

- **Shamsuddin Ahmed** used time-domain electromagnetics and LiDAR data to characterize water flow paths and void space distribution around Owl and Water Sinks Caves, presenting his work at GSA. He is also incorporating resistivity work into his undergraduate thesis project at Appalachian State University, and will be putting together a paper and presentation for the 2024 Sinkhole Conference.
- **Dereje Carl** used LiDAR-SLAM technology to collect data along road cuts throughout the Shenandoah Valley, looking at discontinuities in cut slopes to predict potential rockfall hazards. He presented his work at GSA.
- **Hannah Hitchcock** developed a 3D model of the Cabachuelas Natural Reserve cave system in Puerto Rico using LiDAR data and ArcGIS pro. Her first-author paper has been accepted and she will present her work as a talk at the 2023 Sinkhole Conference in Tampa at the end of March.
- **Catherine Lau** used handheld LiDAR to collect location information regarding historic inscriptions at Grand Caverns in Virginia, helping to develop a technology that can guide visitors and students to various features found within a cave system. She presented her work as a talk at GSA.
- **Peter Manos** studied the impact of karst features on the relationship between land cover and water quality. He presented his work at GSA.
- **Spencer Schmidt** worked on building insight into cave development at Owl Cave by analyzing soils deposited within and around. He presented his work at GSA, and again at an annual

# 18<sup>th</sup> International Congress of Speleology

By Dr. Katarina Kosić Ficco, Virginia Department of Conservation and Recreation, Division of Natural Heritage, Karst Program

The International Congress of Speleology is the world's largest karst and caving event. It is organized every four years by the International Union of Speleology, composed of the national speleological associations from the member countries. The last congress was planned for 2021 in France. However, as with so many things in the past years, it was postponed due to the pandemic until 2022.

The event was held at Savoy Technolac University, located in the small town of Le Bourget du Lac, Savoy, France. The town is situated at a beautiful glacier lake at the foothills of an extensive and scenic limestone plateau. Surrounded by several world-famous caves and scenic canyons, the location was a perfect choice as it offered beautiful tours above and below ground.

Several cavers from the U.S. attended the conference and presented their achievements from the past five years. I presented about Virginia karst. The presentation was well accepted as very little is known about Virginian karst on the world scale, despite its complicated and fascinating geology, biology and hydrology.

The congress also offered various caving-related competitions. The U.S. cavers excelled in the photography, rope course and mapping competitions, bringing home the fastest woman rope climber award and several honorable nominations for photography and mapping sections. ■



Cascade de la Doria. Photo by Dr. Katarina Kosić Ficco

meeting in Baltimore. His work is being incorporated into a publication and presentation at the Athens Institute for Education and Research meeting, for which he will be a co-author.

- **Lilly Smith** used ArcGIS- and LiDAR-derived elevation data from Puerto Rico following Hurricane Maria to map closed depressions in the karst region and evaluate changes due to the hurricane. Her first-author paper has been accepted and she will present her work as a talk at the 2023 Sinkhole Conference.
- **Alondra Valle-Hernandez** used resistivity geophysics to characterize past and present groundwater flow at Owl and Water Sinks Caves. She presented her work at GSA.
- **Z. A. Williams** used Minecraft to build a simulated environment in karst to allow players to collect field data and deduce the underlying geological structure. She presented her work at GSA, and a further evolved version of her work was accepted as a first-author paper and a talk she will present at the 2023 Sinkhole Conference. She continues to develop her simulation and is working on a resistivity geophysics module. She intends to publish these works as faculty resources via the Science Education Research Center (SERC) based at Carleton College.

I would like to thank my co-principal investigator, Angel Garcia, our UPR system coordinator Angel Acosta-Colon, and our additional mentors Yonathan Admassu, Dan Doctor, Bruce Wiggins, Dhanuska Wijesinghe and Kayla Yurco. Additionally, I would like to thank Phil and Charlotte Lucas and the town of Grottoes, Virginia, for their support and access to caves. I would also like to thank the NSF for funding the project, and JMU, the College of Science and Mathematics, and the Department of Geology and Environmental Science for the support they provided. While the project is funded through this summer and next, we intend to continue to renew it as long as we have access to funding, institutional support, mentors, students and caves. ■

## New License Plate: Explore Virginia Caves

By Elizabeth Graves Good, Assistant Manager for Marketing & Public Relations, Luray Caverns



We have designed a DMV-approved Virginia license plate to support the Virginia Cave Board. The Virginia Cave Board works diligently in collaborating with multiple organizations and the Virginia Department of Conservation and Recreation to promote the conservation and protection of caves, karst, cave life and environmental education.

For more information on how to obtain the special license plate, contact Michael Fletcher (FOIA Officer), DCR, at **804-786-8445**, [michael.fletcher@dcr.virginia.gov](mailto:michael.fletcher@dcr.virginia.gov), or 600 E. Main Street, 24th Floor Richmond, VA 23219. You may also contact me at **540-743-6551 ext. 2250**. ■



## Sinkhole Cleanups

*By Meredith Hall Weberg*

Members of the Virginia Cave Board and cavers in the region helped clean out a few sinkholes in October. It takes planning to do this. We need to arrange for a dumpster for trash and a recycling dumpster because it seems a lot of what gets thrown into sinkholes is metal. We need porta johns and food to feed the workers. Oh yes, and we need workers! Cavers are willing to help and actually like doing this kind of work. It makes us feel like we are "giving back to caves."

Do you have a sinkhole (or three) that needs to be cleaned out? Please contact me at [merecaver@yahoo.com](mailto:merecaver@yahoo.com). I'm on the Virginia Region of the National Speleological Society's Conservation Committee. We have planned several sinkhole cleanouts for cave owners and would love to hear about yours! ■