

Bulletin

of the Eastern Section of the National Association of Geoscience Teachers

Volume 71, Issue 3: Summer / Fall 2021

New weathering activity

by Callan Bentley

Piedmont Virginia Community College

I had a fun activity brainstorm yesterday as I was getting ready to teach about mechanical and chemical weathering processes. I made a 'campus weathering scavenger hunt,' wherein teams of students used their cell phone cameras to record instances of various kinds of weathering and erosion on campus, using substrates such as lampposts and concrete sidewalks as exemplars of geological processes. Students needed to apply their understanding from lecture to the vast unfettered landscape of our college campus.

It was a simple little thing, and the students had great fun competing with one another to collect as many examples as quickly as they could. Here's the activity in its entirety:

Hunt around campus for examples of each of the following. Take a photo of each. It may help to label each photo. The group with the greatest number of correct identifications wins 5 additional points on Exam 1.

- Spheroidal weathering (corners or edges of blocks weathering more rapidly than faces or interiors)
- Evidence of dissolution +/- reprecipitation
- Evidence of oxidation on a natural rock
- Evidence of oxidation on an artificial substrate
- Lichens growing
- Root wedging
- Soil erosion
- Pothole

If you task them with the same challenge, what will your students find?



Seneca Rocks, looking southeast, Mouth of Seneca, WV

From the President

by Michael O'Donnell

Blue Ridge Community & Technical College

A new semester begins! And, for some of us, we find ourselves back in a lecture hall or lab facing real students! To those of us that are back in the real classroom instead of a virtual classroom, Awesome! I for one am very happy to see and interact with students (as much as social distancing and a mask will allow!).

I learned over the last 18 months that I can always adapt to new situations, and I can do this because the students are foremost in what we are trying to accomplish. I know my ego gets a big boost when I can lecture about subjects familiar to me, but ultimately, what I do is meaningless if a student cannot take the information with them and use it somehow in some other way. So, anyhow, I hope this fall semester goes well for everyone out there

and I hope everyone stays safe and healthy. I will leave you with some pictures taken during the last 18 months as I dealt with a virtual teaching environment.



Talus of Tuscarora Sandstone on the backside of Seneca Rocks, WV



Cunningham Falls in Cunningham Falls St. Park, MD

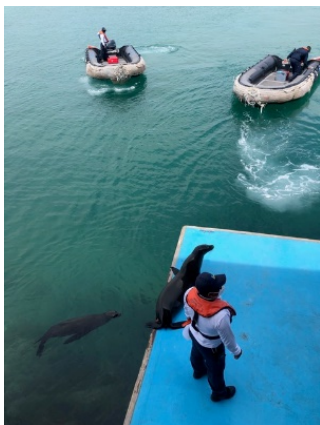




In Darwin's Footsteps: A Remarkably Un-trodden Geologic Wonderland

by Wendy Grimshaw

Nearly six hundred miles off the coast of South America, the Nazca oceanic plate moves about 4 cm per year over a hot spot. Magma from Earth's interior flows through the cracks in the crust, resulting in the formation of islands. Here, in the heart of this remote archipelago, playful sea lions greeted us on the dock at mid-day, setting the tone for a magical five-day interlude amidst geologic wonder.



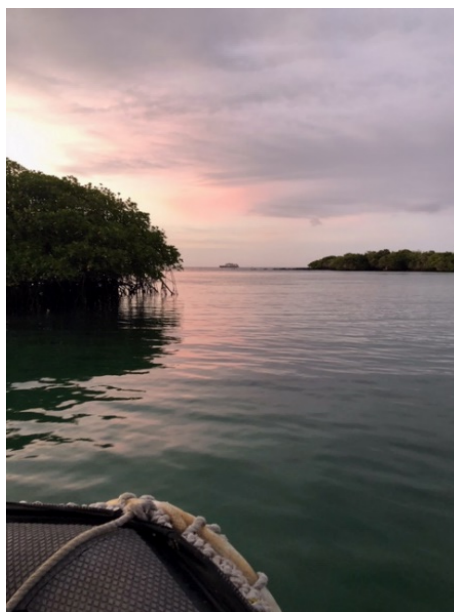
We had landed on Baltra, at first glance a rather barren island that formerly served as a US WWII landing strip. From there, we were whisked away to the National Geographic Islander by zodiac. The surrounding ocean was a clear blue green, the air remarkably crisp. Both

were simultaneously cooled by the waters of the Humboldt current and warmed by the more direct sunlight at the equator. Distant volcanic islands, relative geologic newborns, beckoned. Thirty-one of us, all first-time guests in this Ecuadorian paradise, quickly embraced the active exploration of the Galapagos Islands.

Day One: Caleta Tortuga Negra, Santa Cruz

Ecuador's Galapagos National Park spans 97% of the land area of the islands. Conservation mandates allow visitation of these otherwise uninhabited areas on a limited basis, lending to the ambiance of pristine wilderness. As we were welcomed aboard by the crew for a late lunch, the 164-foot vessel carried us a short distance to explore the oldest region of the islands.

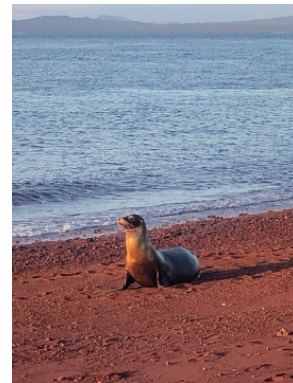
We moored off Santa Cruz, just outside of Caleta Tortuga Negra. For our first excursion, we meandered quietly among the salt-water mangroves that were anchored to the basaltic rock just below the water's surface. Our tranquil visit was rewarded with sightings of many water-dependent species,



among them manta ray, hammerhead shark, green sea turtle, water iguana, sea gull, and heron. The biological diversity exhibited the importance of this coastal system and hinted at its role in the evolutionary nature of life on our planet.

Day Two: North Seymour and Rabida Islands

As we hiked the island path on North Seymour, we channeled the famed Charles Darwin, observing the endemic birds in their natural habitat. From their shallow nests on the dusty ground, Blue Footed Booby glanced at us with curiosity as they tended their young, while male Frigate birds sought new companions from the barren trees. For many of them, our presence was their introduction to humans, and their lack of fear was notable.





The magma that breached the surface to form Rabida Island was rich in iron, and as it erodes, the terrain is tinged with a red hue caused by the iron's oxidation. Our day two hike culminated on the beautiful red-sand beach shortly before sunset, just in time for the young sea lions to greet their mothers, returning from the sea for the evening meal. Before long, the entire length of the beach resembled a rosy nursery for these playful mammals.



Day Three: Isabela & Fernandina Islands

Shortly after crossing over the equator, we headed toward the newer islands of Isabela and Fernandina, where evidence of more recent eruptions was clearly visible. The rugged coastline at Punta Vicente Roca, with impressive volcanic caves and minimal beach area, was perfect for snorkeling, sea kayaking, and zodiac rides amongst the sea turtles, sea lions, tropical fish, cormorants, and Galapagos penguins.

Day Four: Urbina Bay & Tagus Cove, Isabella Island

After waiting out several sets of sizable waves on the zodiac, we managed a wet landing on a rather steep black sand beach in Urbina Bay. This shoreline experienced rapid uplift of almost 50 feet in 1954. Carefully bypassing the nearby sea turtle



nesting area, we set afoot to explore the interior of this largest island. Among the poison apple trees, we encountered a juvenile Galapagos hawk, paper wasps, carpenter bees, and a great many basking land iguanas. The latter, a large breed of territorial reptiles, emerged from their burrows to socialize, hunt, and absorb the sun's energy.

Composed primarily of tholeiitic basalt, the volcanoes on Isabella and Fernandina Islands are taller, more active, and have well-developed calderas. The end of the day included a hike to the top of a caldera, just a short distance from an area explored by Darwin in the 1800's.



Day Five: Espumila Beach, Buccaneer's Cove, & Puerto Egas, Santiago Island

Overnight, we headed back eastward to the island of Santiago. Capitalizing on the expertise of the on-board National Geographic naturalists, the early morning hours found us on a Natural History hike along Espumila Beach, for photography practice and bird watching. After some water exploration in Buccaneer's Cove, we set out for a long afternoon walk at Puerto Egas.





Nurturing a Geoscience Learning Ecosystem in Pennsylvania

by Jonathan Lewis

Indiana University of Pennsylvania

On Santiago, the battle between dynamic volcanic activity, harsh weathering, and erosion was on full display. While the tide pools housed surprisingly little diversity, the area was teeming with life-- newborn fur seals and sea lions, crabs, urchins, water iguanas, and even grasshoppers, were present in abundance.

Day Six: The Santa Cruz Highlands



Climbing into the clouds on our last morning, the air became cool and humid. Donning mud boots, we traversed along the highland trails amid the lush green foliage that blanketed the underlying igneous rock. We encountered hundreds of Galapagos tortoises, some weighing in at 400 pounds. Truly unspoiled by human interference, the primitive and protected Galapagos islands were just as the Expedition Leader, Carlos Romero, described: “the tonic of wilderness.”



You can contribute to the *Bulletin*!

Consider writing up your recent teaching triumphs, field trip locations, geoscience-themed travels, or essays. This issue offers a wealth of examples you might emulate for future editions of **our** newsletter.

We are excited to share news of a new National Science Foundation funded effort to create a Geoscience Learning Ecosystem (GLE) across the Pennsylvania State System of Higher Education (PASSHE). The GLE is designed to be a multi-faceted, sustainable initiative to foster statewide collaboration between faculty, industry partners, and all PASSHE universities with geoscience programs. Key components of the GLE are to create an undergraduate summer geoscience field course available to all PASSHE geoscience students, and a series of geology outreach events for high school students, especially those from communities that historically have been excluded. These events will be interwoven and enhanced by participation with local/regional professional geoscientists.

We expect the GLE to improve field-based instruction and learning for Pennsylvania students, with the goal of increasing their workforce and graduate school preparedness. The GLE will also introduce geoscience career pathways to pre-college students, with the goal of broadening participation in the geosciences.

If you have any questions about any aspect of this project or would like to contribute in some way, feel free to contact any of the principal investigators below:

Dr. Nick Deardorff, Indiana University of Pennsylvania

Dr. Sarah Tindall, Kutztown University

Dr. Eric Straffin, Edinboro University

Dr. Dan Harris, California University of Pennsylvania

Dr. Sean Cornell, Shippensburg University





Guidelines to be Actively Anti-Racist in the Geosciences — Guidelines for Classrooms and Campuses

by **Laura Guertin**
Penn State Brandywine
on behalf of the **2YC URGE pod**

From January-May 2021, twelve geoscientists came together and formed a pod to participate in the Unlearning Racism in Geoscience (URGE) program (<https://urgeoscience.org/>). The program laid out a curriculum to help pods develop anti-racist policies, strategies, and programs to support the participation and retention of BIPOC (Black, Indigenous, People of Color) in the geosciences. What was unique about this particular pod is that the twelve individuals came from twelve different institutions – eleven faculty from two-year colleges (2YCs), and one staff member from SERC. Instead of focusing their time in the URGE program focused on developing customized material for one institution, the pod compiled proven practices in teaching and mentoring to create more inclusive classrooms and campuses, applicable to 2YCs as well as 4YCs.

The resulting 30+ page resource document is divided into sections that focus on students, focus on faculty, and recommend additional resources for learning and exploration. The section on students suggests actions to be taken by faculty that make connections to BIPOC students' interests, commitment, and ability to persist in STEM fields. Materials include how to impact admissions, considerations for the course syllabus (such as land acknowledgement statements, diversity statements, defining office hours, inequities of extra credit), how to lead the first day of class, and curricular materials focusing on equity and justice. To recognize and honor the intersectional identities of

students, the document also includes information on inclusive language and use of gender pronouns. The section concludes with ideas for how to use data to measure inequities in enrollments and course success rates.

The section that focuses on faculty suggests actions to be taken by faculty, staff, and/or administrators to remove institutional barriers and to establish a community that is inclusive, well-resourced, and has accountability. The categories of resources in this section includes suggestions for mentoring and advising, example institutional DEI resolutions and statements, complaints and reporting policies, and faculty hiring.

Although the URGE program concluded earlier this year, the 2YC URGE pod is continuing to meet and work towards developing and implementing anti-racist practices in our classrooms and on our campuses. Our resource document is a living document, and we are committed to adding and expanding the growing list of practices that have a positive impact for the geosciences.

The resource document, titled “Guidelines to be Actively Anti-Racist in the Geosciences at Two-Year Colleges,” is available at:

<https://bit.ly/2YCURGE> The guide can also be accessed from the Web Resources page on the NAGT Geo2YC Division website.

Questions? Please contact Laura Guertin
(guertin@psu.edu)

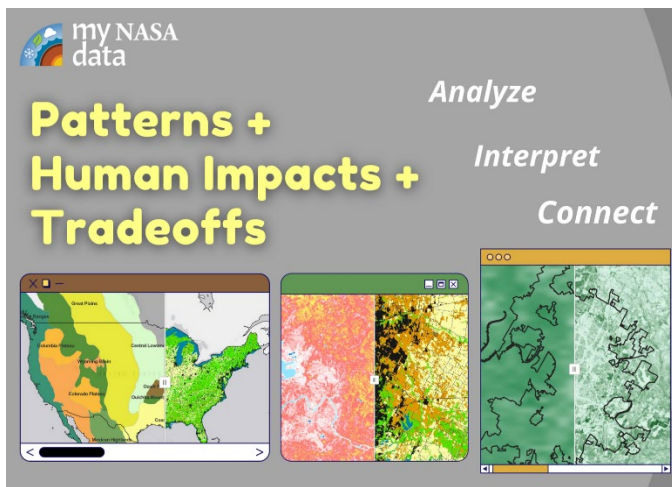


New resources for teaching human impacts

Contributed by **Elizabeth Joyner, NASA**

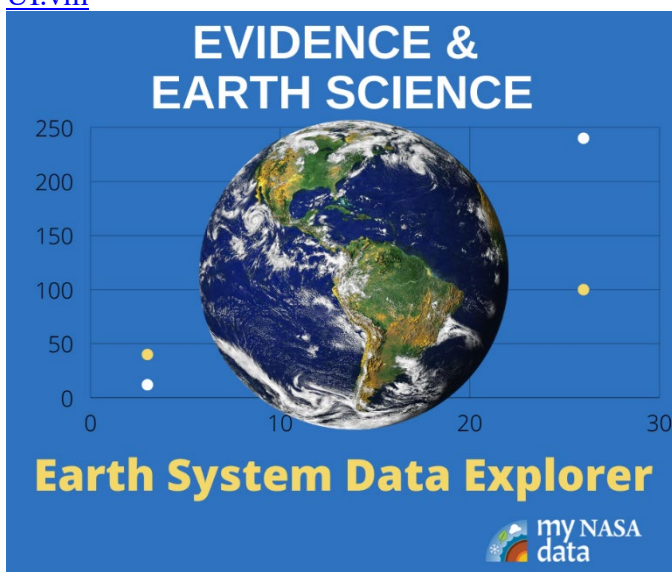
Calling Earth science educators! Explore My NASA Data's new interactive models for visualizing human impacts on the Earth system. These are perfect for in-person and virtual learning. Answer keys and Google Forms are included!

<https://mynasadata.larc.nasa.gov/interactive-models/human-impact-and-creation-urban-heat-islands-interactive-model>



Boost your math lessons to the next level with authentic data from My NASA Data! Earth System Data Explorer has data that's perfect for helping students locate & visualize math functions (and more) with your favorite spreadsheet or math apps. 🌐 📊 🚀

<https://mynasadata.larc.nasa.gov/EarthSystemLAS/UI.vm>



My NASA Data has a new Scientifically Interesting Story for Middle and High School students, and we are looking for feedback from teachers like you!

This resource, [Scientifically Interesting Story of COVID-19 and the Earth System](#), includes the following set of "tools" that teachers may use address the science practice of Data Analysis and Interpretation focused on the topic of Covid-19 and the Earth System. It features GIS interactive models, videos from our own Dr. Brad, Google Slides & Forms, Jamboard and more! These resources are flexible and adaptable and may be

used in a variety of ways depending upon your classroom and instructional needs.

If you are interested in formally reviewing this for My NASA Data, please complete this https://docs.google.com/forms/d/e/1FAIpQLSdKqQ_6iHwFKu9tVzu_ue0yg6suAQ6tQEU_AkVKWS62bWqrow/viewform?usp=sf_link after your implementation and review.



Supported NGSS Performance Expectations:

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.
- HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
- HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Feel free to reach out to our team directly with any questions at larc-mynasadata@mail.nasa.gov.



Visiting Each State's Highest Point: A Geological Hobby

by **Dave Ludwikoski**

Community College of Baltimore County

Past NAGT ES President

Happy Fall, everyone!

One of the things my wife and I like to do when we are traveling in the US is visit the highest point in the state(s) we are traveling through. Granted, some of these are VERY easy to get to, while for others (e.g., Mt. Rainier or Mt. McKinley) we will have to settle for seeing from a distance, since climbing them is just not physically possible for us. To date, we have visited about 15 highest points, plus the one in Washington, D.C. Fortunately, most of the states within the ES have highest points that are very easy to reach. This means that you drive to them and find them after a short, flat walk. These include New Jersey, Delaware, Pennsylvania, and West Virginia. Backbone Mountain in Maryland is not too difficult, with a hike that is a good workout. We have seen Mt. Marcy in New York and Mt. Rogers in Virginia but have not attempted to climb either yet. Each may be a future solo climb by yours truly.

To find the highest point, obviously one needs a state map and then, once the area is reached, to be able to find the USGS benchmark that literally “marks the spot!” For directions, tips and information, I usually use the Summit Highpointers website, which will pop up whenever one googles the highest point for a particular state. For your enjoyment, I have included examples of the high point markers and/or benchmarks for the following: New Jersey, Pennsylvania, and Washington, D.C. Enjoy!



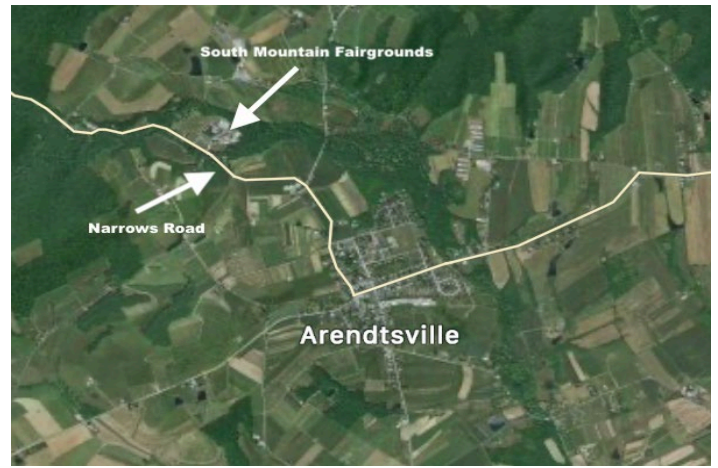
High Point State Park, NJ



Mt. Davis, PA



Fort Reno, Washington, D.C.



Field sketch

by Callan Bentley

Piedmont Virginia Community College

Gem Lake, Rocky Mountain National Park, Colorado

36th Annual Rock, Mineral, & Fossil Swap & Sale Fall Meet

**SATURDAY, OCTOBER 30, 2021 AT
8:30 AM EDT – 3:30 PM EDT**

Sponsored by the Central Pennsylvania and Franklin County Rock & Mineral Clubs

Location:

South Mountain Fairgrounds

West of Arendtsville, PA on route 234

615 Narrows Rd, Biglerville, PA 17307-9519

General admission is \$1.00

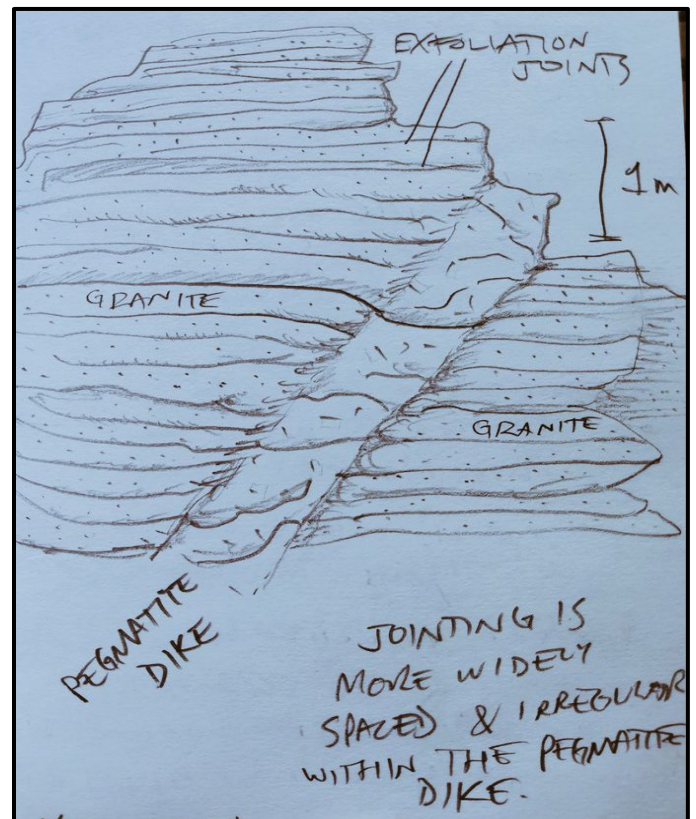
The South Mountain Fairgrounds are located just a few miles northwest of historic Gettysburg, Pennsylvania. Table space for selling and swapping (\$5 per 12 foot table) is still available inside a large, rustic pavilion at the fairgrounds. There is also ample space to set up outside; if you want to do that, please bring your own tables.

The show features a wide variety of geologic samples available for sale or swap. It also provides an excellent opportunity to acquire rocks, minerals and fossils from locations here in Pennsylvania.

Ample parking, food truck and rest rooms on site.

For more information contact Tom Smith at

tsmith1012@comcast.net.



The *Bulletin* is edited by Callan Bentley, Piedmont Virginia Community College. Please get in touch with your feedback, contributions, or if you would be interested in helping out with editing.

Outcrops #5

by Steve Lindberg

University of Pittsburgh at Johnstown

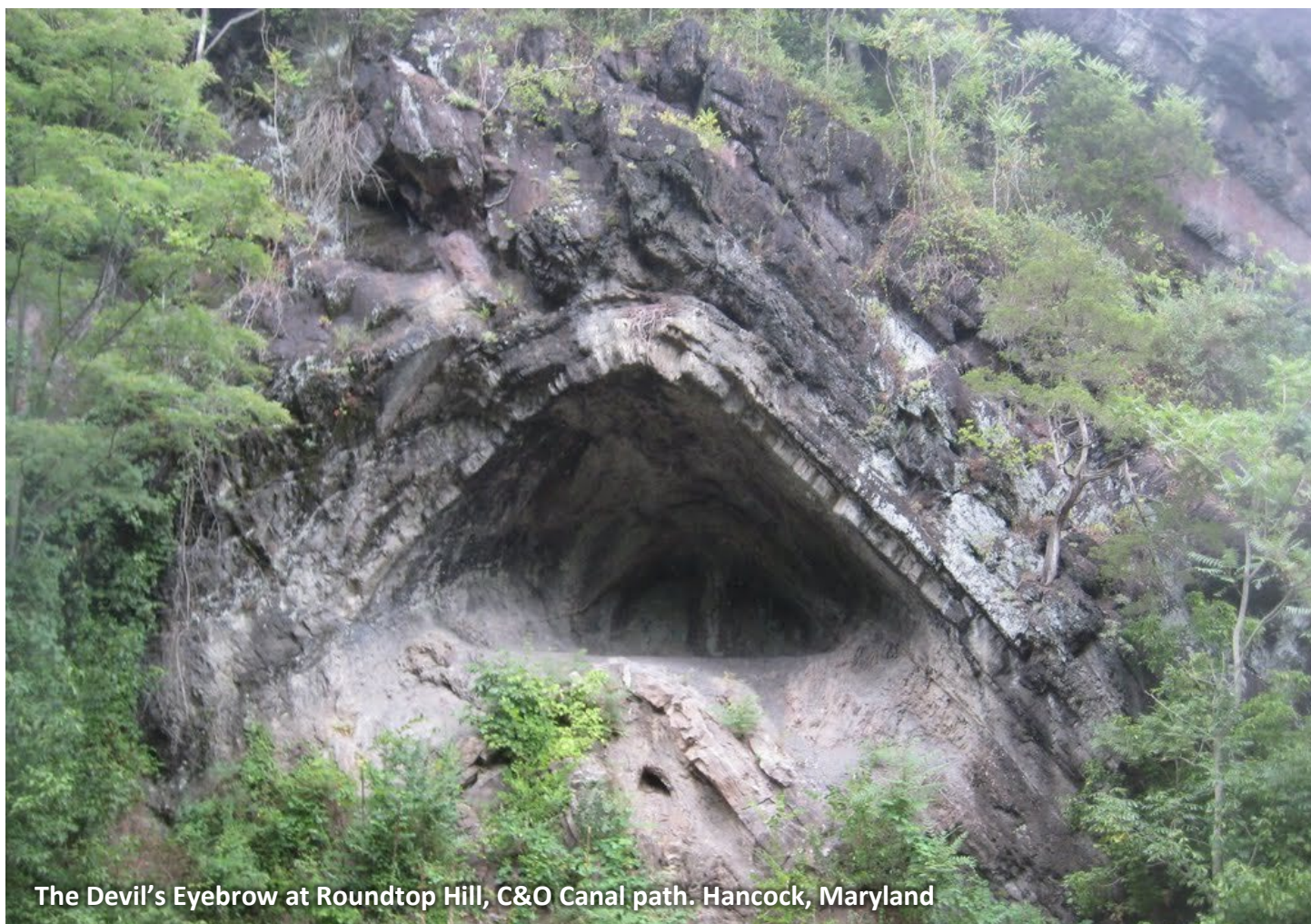
The New Enterprise Stone and Lime Co. is a major producer of aggregate stone, hot mix asphalt and concrete products throughout Pennsylvania. The Bakersville Quarry located in Somerset County, Pennsylvania is mining The Late Mississippian Period *Loyalhanna Limestone*, which is accessed by subsurface mine. Due to the gritty texture; The Loyalhanna is considered a superior crushed stone to be used within asphalt paving of roads and highways and is rated by PennDOT as the preferred stone for hot asphalt mix. Here at the Bakersville subsurface quarry the average production is about 2,000 to 3,000 tons per day.

The Loyalhanna Limestone is an arenaceous calcarenite / orthoquartzite that extends from West Virginia to western Maryland and into southwestern Pennsylvania. With its characteristic large scale cross-bedding the Loyalhanna Limestone has been interpreted as either a marine or eolian environment of deposition. Based on the discovery of marine fossils that include trilobites, the general consensus is that the Loyalhanna represents a high energy near-shore depositional environment.

This photo shows the entry and exit portals to the Loyalhanna subsurface mine at the NES&L Co. Bakersville, Pennsylvania quarry. The height of the entry/exit tunnel is about 20 feet. The Loyalhanna averages about 70 feet in thickness at this location and has a characteristic gray/olive gray color. Immediately above the Loyalhanna can be seen the transition to the maroon units of the lower Mississippian Mauch Chunk Formation. Visible in the highwall between the two tunnels is a small thrust fault that required extensive roof bolting in the area of the entries.



Photo by Steve Lindberg. May, 2021



The Devil's Eyebrow at Roundtop Hill, C&O Canal path. Hancock, Maryland

EASTERN SECTION SPRING 2022 MEETING

by **Steve Lindberg**

University of Pittsburgh at Johnstown

Initial planning has started to hold our spring 2022 meeting “in person” the weekend of May 19, 20, 21 at Berkeley Springs, West Virginia. Berkeley Springs is located along route 522 just a few miles south of Hancock, Maryland. This location offers a wealth of unique geologic sites that include the U.S. Silica plant and mine located along route 522 between Berkeley Springs and Hancock, nearby Sideling Hill, and the Roundtop Hill exposures along the C&O Canal in Hancock. Final meeting details will be coming in the winter edition of the eastern section *Bulletin*. Until then, here is a summary of the meeting schedule:

Thursday, May 19. Early bird arrivals and check-in at the meeting head-quarters located at a “not yet” selected hotel in Berkeley Springs. Dinner on

your own. Thursday evening social gathering at a geoscience related location. There are numerous hotels in Berkeley Springs and nearby Hancock for attendees to choose from.

Friday, May 20. Morning poster session, presentations, lunch details to be determined. Friday afternoon field trip to local geoscience site (U.S. Silica plant and mine). Dinner on your own. Friday evening eastern section “Geoauktion” at the hotel in Berkeley Springs.

Saturday, May 21. Morning field trip to Roundtop Hill geologic cut along the C&O Canal in Hancock, Maryland that includes the Devil’s Eyebrow and cement plant ruins. Lunch provided. Optional afternoon quick field trip to Sideling Hill or Hancock Geologic Museum, and/or section business meeting (which we can probably do on Zoom after the meeting). Evening eastern section awards dinner (OEST and others), guest speaker.

More details to follow.





SUMMER/FALL 2021 EDITION OF “FROM THE ARCHIVES”

by **Steve Lindberg,**

University of Pittsburgh at Johnstown
Eastern Section Archivist

The 1980 eastern section meeting focused on the *Geologic Hazards Of Pittsburgh* and included numerous field stops throughout the greater

Pittsburgh area. Mine subsidence, landslides and rock falls were studied in stops at Birdville Elementary School, Royal Street, Thompson Run and Heights Drive in Millville. The field trip leader for the weekend excursions was Jesse L. Craft. Within the archive folder for 1980 I discovered an envelope with 25 black and white photos (all unlabeled) that show various locations visited on the field trip along with hands-on type activities using topographic and aerial photographs. Here is a selection of some of those photos; recognize anyone here? (I certainly do!). Enjoy!



FROM
THE
ARCHIVES



Reminder:

Abstracts for the northeastern section meeting of the Geological Society of America (GSA) 2022 in Lancaster, PA are due on **December 14, 2021.**

https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/ne/2022mtg/techprog.aspx



FROM
THE
ARCHIVES



Reminder:

National Earth Science Week is October 10-16. Teachers can place their orders for an [Earth Science Week 2021 Toolkit](#) from AGI, which has everything a teacher needs to prepare and celebrate with their students. This year's theme is "Water Today and for the Future." The toolkit is \$8.50 plus shipping and handling.

Nominate your peers!

(Nominate yourself!)

by **Christopher Roemmele**
West Chester University

Greetings to all educators of geology and earth science. I am Christopher Roemmele, your new Awards Chair for NAGTES. I teach at West Chester University in West Chester, Pennsylvania, and taught high school/middle school earth science for 15 years in New Jersey. I know how hard we all work as teachers and getting a proverbial pat on the back and thank you is nicely motivating. Perhaps you work with or know someone whom you feel deserves this recognition. In that case, I strongly urge you to nominate this person for one of our Eastern Section awards, or one of the National NAGT awards. The Eastern Section meeting is a wonderful time to heap praise upon those individuals who have excelled in the work and promoted geoscience education.

Information about all our Eastern Section awards can be found on our section website. Please note the deadline is being/has been changed to February 1! So start thinking and get those forms filled out now! Completed nomination forms should be sent to me at croemmele@wcupa.edu. However, you must place your nomination via the online forms found on the National NAGT web site at <http://nagt.org/nagt/programs/oest.html>

Here is a list of our awards. Perhaps there is one with your (or a colleague's) name on it!



OUTSTANDING EARTH SCIENCE TEACHER

The OEST Awards program was adopted by NAGT in 1971. Its purpose to honor pre-college teachers of earth science, their excellence and commitment to teaching and teaching earth science

DIGMAN AWARD FOR EXCELLENCE IN GEOSCIENCE EDUCATION

The Digman Award is designed to recognize an individual who works to bring geoscience to the general public. We look for individuals who are not teachers, but work in a capacity that educates the general public in areas of the geosciences. Museum directors, curators and assistants, state survey employees, mine and quarry public relations people would all qualify for this award. The nomination information for this award is also on our section website.

JAMES O'CONNOR MEMORIAL FIELD CAMP SCHOLARSHIP

The James O'Connor scholarship is given to a college geology or earth science major who is attending a geologic field camp course (typically over the summer) as part of their college degree program. The \$500 scholarship assists the student in covering the expenses of their field camp. Nominate a student currently enrolled in your geology program. Nomination information appears on the section website.

DISTINGUISHED SERVICE AWARD FOR THE EASTERN SECTION

The Distinguished Service Award is given to a member of the Eastern Section (still actively teaching or retired) who has, over the years, contributed to the growth and activities of the Eastern Section. This person should have a history of continued service to the Eastern Section. Nomination information appears on our website.

JOHN MOSS AWARD FOR OUTSTANDING COLLEGE TEACHING

The John Moss award is reserved for instructors and professors who, at the college level, model and promote outstanding teaching in the geosciences. Nomination information appears on section website.

