

# PCPG Newsletter

Communicating Key Information & Concerns  
to Geologists and Environmental Professionals

Issue 1 / 2021

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## MESSAGE FROM THE PRESIDENT

### What's in a Title?

I would like to welcome Jason Floyd, P.G., and Vicki Pitman, P.G., to the PCPG Board of Directors and welcome back Tom Wagner, P.G., who was reelected. Tom will be continuing as Government Affairs Chair. Many thanks to John Torrence, P.G., and Russ Losco, P.G., whose terms ended on December 31 for their many years of dedication and service to PCPG. Russ has agreed to continue with our Podcast initiative.



Welcome 2021!! I don't know anyone who was sad to say goodbye to 2020. It was a rough year on many fronts. I am hopeful for a better, more social, travel-filled 2021. Each new year, I find myself reevaluating on many levels. Personally, I strive to exercise more, lose weight and get more sleep. I also try to reflect on a professional level. Last year, I challenged everyone to reignite their passion in geology; to stand up, speak out and show everyone that the professional geologist is very relevant to today's society.

As I contemplate about being a professional geologist, a quick search on the [PA Licensing Verification](#) service reveals 4,160 PG and 553 Geologist-in-Training (GIT) records. Less than 5,000 people are registered in Pennsylvania who can include the word geologist in their title; what a small fraternity! When PCPG does college visits, we explain that [PA PG Law](#) states "it is unlawful...for any person to practice or to offer to practice geology unless he is licensed and registered" in PA. Section 3(b) further states that one is considered to practice geology if "by verbal claim, sign, advertisement, letterhead, card, or in any other way represents himself to be...[a] geologist, or through the use of some other title implies that he is...[a] geologist...or who...perform[s] any geological service or work...recognized as... geology." There are some exceptions to licensure outlined in Section 5 Exemptions, most notably those engaged in oil & gas exploration and development.

The law also defines the Practice of Geology to include "describing the natural processes...on earth materials,...predicting the...occurrence of natural resources, predicting and locating natural or man-induced...hazardous [phenomena] and recognizing, determining and evaluating geologic factors." The term also includes "consultation, investigation, evaluation, planning, mapping and inspection of geological work" required to comply with regulations and permits. (Full definition in Section 2(n))

Continued on Page 7

# UPCOMING PCPG EVENTS

**February 1 - February 17, 2021**

Six Webinar Package:

PG Review Course for the Practicing Geologist and ASBOG® Exam Candidate (900 mins.)

**Webinars:**

**Monday and Wednesday - 6:00 - 8:30 PM**

**PCPG Members \$399; Non-Members \$599**

*Or, enroll individually according to specific topics of interest:*

**February 1, 2021 - Part 1**

General, Field Geology, and Geomorphology;  
and Seismology, Exploration Geophysics,  
and Well Logging (150 mins.)

**Webinar: 6:00 - 8:30 PM**

**February 3, 2021 - Part 2**

Mineralogy and Igneous/Metamorphic Petrology;  
Sedimentology and Stratigraphy (150 mins.)

**Webinar: 6:00 - 8:30 PM**

**February 8, 2021 - Part 3**

Paleontology; Structural Geology and Tectonics  
(150 mins.)

**Webinar: 6:00 - 8:30 PM**

**February 10, 2021 - Part 4**

Hydrogeology and Geochemistry (150 mins.)

**Webinar: 6:00 - 8:30 PM**

**February 15, 2021 - Part 5**

Engineering Geology (150 mins.)

**Webinar: 6:00 - 8:30 PM**

**February 17, 2021 - Part 6**

Economic and Resources Geology:  
Mining, Petroleum, and Coal (150 mins.)

**Webinar: 6:00 - 8:30 PM**

***For a complete list of  
upcoming events or to register  
online, check our  
[HOME PAGE](#) event calendar,  
or visit  
[PCPG'S COURSES AND EVENTS](#)  
web page.***



## FOURTH QUARTER PCPG PHOTO CONTEST WINNERS ANNOUNCED

It's been said that two data points are a trend, three data points are a story. We've completed two photo contests and the first quarter of 2021 marks the start of our third quarterly photo contest. Between the first two contests 36 photos were submitted from 15 different members. We truly appreciate the participation, as each photo shares a brief story of the experiences of our members and geology from around the world.

The fourth quarter photo contest opened in November and closed on December 14th. We were pleased to have received 17 photo entries from 10 PCPG members. Thank you to all who submitted photos. After much deliberation, four winners were selected by the Photo Committee and are as follows: Antonette (Toni) Markowski, P.G., for her vacation photo in front of Crater Lake in Oregon; Jennifer O'Reilly, P.G., for a photo of cross-bedding and weathering at Valley of Fire in Nevada; Liz Heness, G.I.T., for her photo taken at Seven Tubs Nature Area in Pennsylvania; and Stan Conti, P.G., for his black and white photo of the Grand Canyon. Congratulations!

Each winner will receive a PCPG sticker in the mail. In addition, all photos that were submitted will be posted to the [PCPG website](#), along with a brief bio of each winner. The winning photos were selected because they highlighted skilled photography and captured a few incredible geologic vacation destinations.

Continuing the trend into 2021, PCPG will hold themed quarterly photo contests. The theme of the first quarter 2021 photo contest will be "Geology of Pennsylvania." The PCPG website will be getting a makeover this year and we look forward to decorating it with some of your photos. Between all of our readers there must be thousands of stunning, interesting, and iconic photos of Geology in Pennsylvania. We challenge you to take 15 minutes out of your quarter and send us a photo. Please include a caption of where the photo was taken (and/or geographic coordinates), when the photo was taken, and a brief explanation of the geologic feature.

We will take submissions through Friday, March 5th. Email your submission to PCPG Board Member Kurt Frieauf, PhD, P.G., at [frieauf@kutztown.edu](mailto:frieauf@kutztown.edu) with the subject line: PCPG photo contest. If you are selected as a winner, we will contact you to gather your "story" and mailing address. Note that by submitting a photo you are giving PCPG permission to use the photo in the PCPG Newsletter, PCPG website, or other PCPG media (proper credit will be given).

PCPG Photo Committee: Kurt Frieauf, PhD, P.G., Emily Glick, P.G., Russell Losco, P.G., Jackie Reichl, P.G.

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**Crater Lake, OR**

*Photographer: Antonette (Toni) Markowski, P.G., is a Senior Geologic Scientist in the Economic Geology Division of DCNR's Pennsylvania Geological Survey who has authored multiple publications and given talks to various organizations on coalbed methane in Pennsylvania - her favorite subject in geology. After receiving a BS in Earth-Space Science Secondary Education from Shippensburg University, she transitioned into geology at Millersville University, then earned her MS at Southern Illinois University in Carbondale studying Geology and Petrology of Tertiary Lignites Adjacent to the Beartooth Mountain Front, Montana-Wyoming. She's worked as a geologist for 37 years now.*



**Valley of Fire, cross-bedding and weathering**

*Photographer: Jennifer O'Reilly, P.G., is currently a senior operations manager and principal hydrogeologist for Groundwater & Environmental Services, Inc. (GES) and is a past PCPG president and board member. After earning her BA at SUNY Geneseo and her MSc at Texas Tech University studying Stable Isotope Geochemistry of the Caprock Caliche (she reconstructed paleoclimatic conditions of the Southern High Plains), she has worked as a geologist for 25 years, 23 of which have been with GES in Exton. She's maintained her interest in isotope geochemistry and she cautions, "you can't trust atoms; they make up everything!"*



## Seven Tubs, PA

*Photographer: Liz Heness, G.I.T., is a freshly-minted*

*geologist-in-training, earning her GIT license in December 2020. She double majored in geology and environmental sciences for her BS at Kutztown University where she was a star student, then earned her MSc at the University of Texas at El Paso (UTEP) studying Salt tectonic controls on facies and sequence stratigraphy of the Triassic Chinle Formation, Gypsum Valley Salt Wall, Colorado. After working in Virginia for two years, she has returned home to Pennsylvania to work at Tetra Tech in Pittsburgh. With four years of experience, she is looking forward to taking the final PG exam in the near future. She's long been interested in sedimentology, but has more recently become fascinated by karst hydrogeology.*



## Grand Canyon

*Photographer: Stan Conti earned his BSc at Edinboro University of Pennsylvania and started working in environmental engineering geology in 1971. He has worked in 21 states, including Alaska, and worked with the Navy doing residential sampling of tap water and groundwater in Naples, Italy. Stan's been retired for the past few years, but is open for opportunities to apply his expertise. Stan's favorite topic in geology is deep mud rotary drilling supervision because the changes in lithology can be so striking, even in purely unconsolidated material.*



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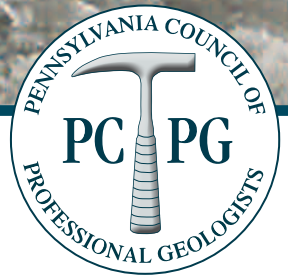
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## ENGINEERING GEOLOGY

A Professional Geologist (PG) works on various engineering projects as part of the design team to develop a safe, efficient, and effective design by evaluating and understanding the subsurface conditions at a project site.

- Any construction project such as a roadway or bridge structure, new building or residential complex, airport development, or coastal construction, needs a geotechnical evaluation prior to any earth movement to determine subsurface conditions which can vary widely from one project to the next.
- A PG skilled in engineering geology works with the design team during the planning phase to determine what issues need evaluated from a geologic standpoint including soil, bedrock, and groundwater conditions. This may include a combination of drilling, laboratory testing, geophysical evaluations, or remote sensing.
- The PG develops an investigation best suited to the proposed construction, coordinating with the various consultants and contractors, collecting and reviewing the results of the investigation, then provides direction to the structural, highway, environmental, or civil designers to better refine the design.
- A typical investigation usually starts by reviewing geologic and topographic maps, historical publications including underground mine maps, and identifying subsurface conditions for potential hazards.
- The PG may also review current and historical aerial photography to research fracture traces, indications of historical landslides, or identify sinkholes.
- The PG may collect or oversee rock orientation measurements (strike/dip), map the frequency and direction of fractures at outcrops and identify areas with evidence of slope instability.
- Geophysical investigations, including resistivity, seismic refraction, or gravity surveys may be used to identify the depth to and quality of bedrock, the location and orientation of bedrock fractures, or delineate subsurface hazards such as voids associated with karst or mining features.
- The field investigation usually includes test borings and/or test pits to classify the soil, obtain compressive or shear strength measurements, and determine the competence of the underlying rock. Soil and rock core samples are collected for subsequent laboratory testing and in-situ water infiltration tests to support water management designs may also be done.
- Water wells may be installed to monitor groundwater conditions, or inclinometers to monitor ground movement.



*Geotechnical drill rig used for slope stability analysis.*



*Single span bridge replacement in alluvium.*

- Laboratory testing may include rock breaks to determine the strength of bedrock, direct shear of soil to determine the bearing capacity, or consolidation testing to assist in calculating the settlement.
- The results of the investigation plan are used to develop the design. Retaining walls, bridge abutments, rock cut slopes, building footings, well pads, or runways will all require designs. Bearing resistance, soil settlement, rock fall, rock topple, embankment stability, pavement, or wall overturning factors are evaluated using design programs and/or hand calculations.
- The PG will then assist the design team in developing their project plans and specifications so that the design is appropriately portrayed for contractors to bid the project.
- The PG applies their professional seal to a report or design plan indicating they have reviewed the plan and are taking ownership of their analysis and conclusions.

**The PG typically works with civil engineers, structural engineers, hydrogeologists, construction specialists, soil scientists, drilling crews, and environmental specialists.**

### **Work Resources:**

GIS/mapping, various map databases (geologic, topographic, underground mine, and landslide maps), historical reports, aerial photography, modeling and analysis software.

### **Work Environment:**

Office, computers, and field work. Field work is done all year in any weather and may be required during off-peak transportation hours, including weekends or a particular site's off-season.

### **Helpful Skills & Experience:**

Strong technical understanding of the physical properties of soil/rock/water, ability to think about projects in three dimensions, strong understanding of physics, ability to coordinate with multiple disciplines about various design concerns, and an interest in working as part of a team.

### **Tools of the Trade:**

Drill rig, Brunton compass, water/soil sampling equipment, and a good set of hiking boots.

## PRESIDENT *Continued from Page 1*

I have done geologic work my entire career and in my early days held the titles of geologist, field geologist, exploration geologist, and hydrogeologist. This was prior to the PG law so my employer could use those titles for me. Geologists are a limited fraternity and since the passage of the law, we need to protect our identity. It takes a lot of effort, study, practical experience and passing two rigorous exams to claim the geologist title and every one of us should be very proud and protective of that effort. The GIT is also defined in *Section 2(s)* and individuals must pass one test on the Fundamentals of Geology.

What is your title and the title of each of your employees? Do they comply with the law by verbal claim, business card or other ways of communicating today like email, video chat and messaging? I urge everyone to review your titles and make sure that all of the company's employees are in compliance with the law. For brevity, I excluded engineering and land surveying from the above excerpts, but those titles are also defined in the [PA Law](#) and should be reviewed for compliance.

I also encourage everyone to review *Section 4(g)* on Suspension and Revocation of Licenses which includes the code of ethics as a reminder that we are all bound to uphold our honorable and dignified profession. The [PG code of ethics](#) and a link to the PG law can be found in the Resources section of our website [PCPG.org](#).

PCPG was founded by geologists seeking licensure in PA and it is our duty to guard against the use of the geologist title until it is duly earned. I outlined in my first president's message last year that what geologists do is extremely important to many aspects of people's lives in today's society. The [PG Law](#) recognized that a licensed professional geologist is entrusted "to safeguard life, health or property and to promote the general welfare." This year show your pride in earning the title of Professional Geologist and continue to stand up and speak out about the important work we do every day.

Very Truly Yours,



Barbara J. Dunst, P.G., C.P.G.

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## A GEOLOGIST'S JOURNEY BIKING THE GREAT ALLEGHENY PASSAGE AND C&O TRAIL FROM PITTSBURGH, PA TO WASHINGTON, DC

By Tom Wagner, P.G., PCPG GAC Chair

With the final stretch of 2020 in view, COVID-19 has profoundly impacted many people both professionally and personally. Like many of you, I had to cancel vacation plans in favor of staycations and find new ways to unwind with those hard-earned time off hours.

Winding the clock back a bit, it was still summertime in Pittsburgh and my kids were out playing while I was enjoying some beers outside with the neighbors (properly distanced of course). Small talk, likely about how our families were all coping with the current situation and security of our jobs turned into how we were going to plan to spend our vacation time once we could travel and how we might spend it should travel restrictions continue. Several beers in, this turned into discussion of how we would spend all the accumulated time off on trips we didn't think were actually possible. At this point, one of my neighbors mentioned they had biked from Pittsburgh, PA to Washington, D.C. years ago and wanted to do it again. Feeling great after several high ABV IPA's and growing weary of future travel plans for my own personal planned adventure (backpacking the Grand Canyon when I turn 40, which seems fleeting under present conditions), I quickly chimed in with a "let's do it, let's make it happen." As you would expect, the rest of them chimed in and said "Yeah, let's do it" as one will typically do when inebriated. Well, fast forward three months later and only two of the six of us put in the planning and training to actually make it happen.

Over the course of six days, we traveled 350 miles starting out along the south shore of the Monongahela River in Pittsburgh on the Great Allegheny Passage Trail. We peddled through broad synclines of Pennsylvanian stratigraphy and anticlines exposing Mississippian stratigraphy as we made our Approach to the Appalachian fold and thrust belt. After passing through the small town of Confluence, you'll begin your climb up to the Eastern Continental Divide and the start of the Appalachian fold and thrust belt before beginning your descent down into Cumberland which marks the end of the Great Allegheny Passage trail (or start depending on which direction you are travelling).

*Continued on Page 9*



Map of Pittsburgh to DC Bike Trip.



## NEW PCPG CORPORATE MEMBER

Please join us in welcoming our newest

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## BIKING *Continued from Page 8*

After an overnight stay at a B&B in Cumberland to recover, we began the next day starting the rest of the journey to our nation's capital on the C&O towpath. This trail is not as wide as the Great Allegheny Passage but has many exposures of folded Cambrian through Devonian bedrock including small sections of Precambrian basement rock. There are many historic landmarks and remnants of old structures to explore along this part of the trail in addition to the geology. The trail follows an old canal that was built alongside the Potomac River once used as a way to transport goods for trade. The most memorable section was the Paw Paw tunnel. It is a brick lined tunnel approximately 0.6 miles long built by hand in the early 1800's near an axial plane of an anticline which is folded almost at the scale of the width of the tunnel.

After grinding the gears for many miles through several small towns along the Potomac you'll pass through Harpers Ferry, which is also a great stop whether traveling by bike or by car. Harpers Ferry rests at the confluence between the Shenandoah and Potomac Rivers and has many historic buildings, rustic B&B's, restaurants and interesting little shops. From Harpers Ferry it is only about another 62 miles to the nation's capital where the last quarter mile or so of the trail is not well marked in Georgetown. The sign at the end (or beginning) of the trail

is a bit of a letdown as it dead ends into a parkway, but just another mile further south will have you arriving to a view of the Washington Monument, reflecting pool and Lincoln Memorial that more than makes up for it.

For those looking for a week-long adventure filled with history and some great sections of North America geology I would highly recommend making this trek especially during the fall with all the great fall foliage.

*Editor's Note: PCPG is also producing a podcast of Tom's trip that provides a more in-depth discussion of the trials and tribulations of this journey as well as the many wonderful geologic and historic features encountered along the way. When available, we'll provide the link to Tom's detailed description of the imagery, history, and geology observed during his trip.*



Entrance to Paw Paw Tunnel. Geologist on the ledge for scale.

## KIDS' GEOLOGY EDUCATION

### Soil Sample Cupcakes

What kid doesn't like playing with their food? Why not use cupcakes for a lesson in geology!

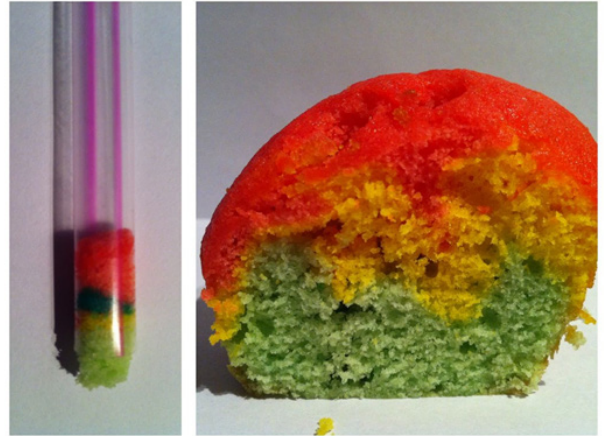
Adapted from: <https://scoutermom.com/1252/soil-sample-cup-cakes-recipe/>

#### Equipment:

- White cake mix
- Four bowls
- Food coloring
- Cupcake liners
- Cupcake pans
- Chocolate frosting
- Green sprinkles
- Straws (clear – thicker ones work better) \*or any small hollow tube in lieu of plastic straw

#### Directions:

1. Prepare the cake mix according to package directions.
2. Divide the cake batter evenly between the four bowls.
3. Leave one of the bowls of batter white. Mix a different color into the other bowls, so you have three additional colors.
4. Put the liners in the cupcake pans.
5. Carefully spoon the batters into the liners, one color at a time, so that you have different layers of color.
6. Bake according to package directions.
7. Let cool.
8. Frost with icing (for topsoil) and sprinkle with green sprinkles (for grass!)
9. Insert the straw in the cupcake to take a "soil sample" or "soil core." If the straw is clear, you should be able to see the layers through the straw. You might even be able to blow through the straw to get the sample out!
10. Use the cupcake core sample to illustrate soil horizons and bedrock geology.
11. And, of course...eat the cupcake!

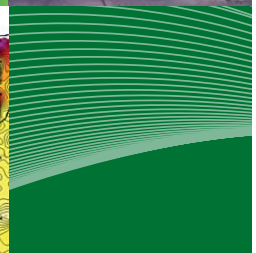
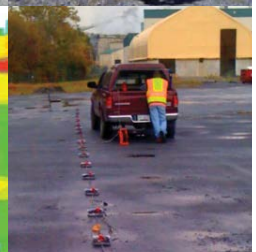
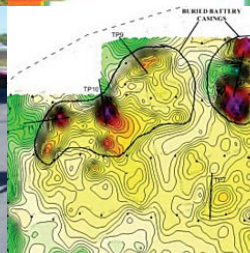
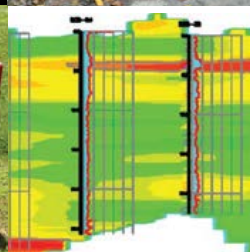
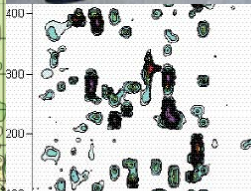
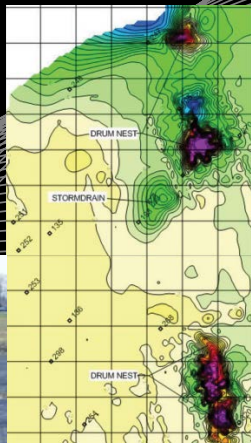


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## DEADLINE FOR OUR NEXT NEWSLETTER IS APRIL 15, 2021

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