PCPG Newsletter

Communicating Key Information and Concerns to Geologists and Environmental Professionals

Issue 1 / 2022

Inside this issue...

BOARD OF DIRECTORS

General Information: PCPG Office

Message from the President

Hello PCPG members!

I am excited to serve as the 2022 PCPG President and want to express my appreciation for the considerable efforts of our Past-President, Barb Dunst, P.G., who over the past two years worked diligently to further develop this organization. I've been fortunate to serve on the board of this organization for the last five years and have seen great accomplishments along the way.

I recently looked through older PCPG resources, it became clear that the goals and challenges of the organization and geologic community remain largely the same, including providing quality continuing education and the need to attract younger generations to this profession. Over the last few years PCPG used stakeholder surveys and enlisted the services of a strategic planning firm in 2018 to objectively review and identify new goals for the organization. Some confirmed and new goals for PCPG include: enhance education opportunities, grow the organization to better serve the geologic community, become a valued workforce development partner, and help develop the next generation of professionals.

Another goal that came out of our planning efforts over the years was to enhance the understanding and appreciation of the economic, environmental, and public safety benefits created by licensed professional geologists, to enhance the recognition of the geoscience community. Outside of our community of geologists and allied scientists, what level of understanding does the general public have on what we do? Often "very little" is the answer. This has become more apparent to me over the last few years as public engagement in environmental projects has become a regulatory focus. In light of this, it is even more important not only to expand the public's understanding on what geologists do, but also inform and encourage the next generation to explore and pursue a future in geological sciences.

In response to these challenges, the board has worked to increase variety and virtual presence of educational opportunities, improve stakeholder engagement and networking, update the website, add a corporate directory and job board to the website (currently in the works), and develop a podcast series, among other things. PCPG's board is always looking for innovative ways to further the goals of the organization.

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UPCOMING PCPG EVENTS

February 16, 2022
Dust Suppression with Appalachian Basin Oil and Gas Produced Water: Efficacy and Water Quality
(60 mins.)
Webinar: 1:00 - 2:00 PM

March 29, 2022
Hydrostructural Methods in Bedrock Aquifer Characterization and Remedial Decision Making
(405 mins.)
Coatesville, PA

April 13, 2022 - Save the date
PCPG Annual Meeting and Education Sessions
(220 mins.)
Harrisburg, PA

April 19, 2022
Essentials of Borehole Geophysics with Field Demonstration
(300 mins.)
Middletown, PA

April 26, 2022
Factors affecting groundwater quality used for domestic supply in Marcellus Shale region of north-central and north-east Pennsylvania
(60 mins.)
Webinar: 1:00 - 2:00 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.

Can You Identify this Mineral?

Answer on page 8.
Source: Jim Hook/"Public Opinion"

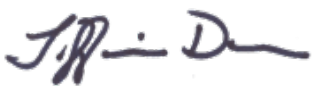
PRESIDENT'S MESSAGE *Continued from Page 1*

We encourage member input and ideas to identify ways to assist the geologic community and advance the practice of geology and allied sciences.

Finally, please welcome our newest board members for the 2022-2024 session, Michele Cooney, P.G. (PA DCNR Bureau of Geological Survey), Jenny Kachel, P.G. (Stantec), and Mark Sakino, P.G. We welcome back Greg Rosenzweig, P.G. (GES) and Chris Kotch, P.G. (Barry Isett & Associates), who were re-elected for another 3-year term. I would also like to congratulate Vincent Carbone, P.G., who will serve as PCPG President in 2023, and express appreciation for Tom Jordan, PhD, P.G., Jackie Reichl, P.G., and Kurt Friehauf, PhD, P.G., whose terms ended in December. Special thanks to Kurt for serving six years on the board and to Tom who will now serve as Education Chair after a herculean effort by Dan Billman, P.G., who lifted us into the 21st century through his efforts to build a robust webinar program! Their efforts beyond the day-to-day professional responsibilities, which keep us all very busy, have contributed to the growth of PCPG.

We are currently planning for the Annual Meeting to be held in person this year in April and I look forward to seeing you there!

Very Truly Yours,



Tiffani Doerr, P.G.
PCPG President

Outreach Committee Update

Vincent Carbone, P.G. (HDR), PCPG Outreach Services Committee Chair

Happy 2022 PCPG!

As the Outreach Committee Chair, I wanted to take this opportunity to recap on some of the work we did in 2021 and opportunities we plan to provide in 2022 to our membership, students, and the broader community. Although COVID has limited some of our outreach activities, we have continued to serve the geoscience community.

Students

In 2021, PCPG continued trips and virtual presentations to Geoscience Departments of several universities. Presentations provide discussion on geoscience careers and the importance of obtaining a Professional Geologist license. Most recently PCPG visited with Indiana University of Pennsylvania and West Chester University. Not only did we have an hour-long dialogue with students and faculty, but we were able to provide "after talk" discussions with individual students on their specific interests, drawing on our professional experience. At the Lafayette College career fair, PCPG connected with freshman through senior level students who were discerning their geoscience careers and provided useful feedback to questions about their upcoming decisions. In April of 2021, PCPG held our first virtual panel discussion tailored to students following our annual meeting. The panel was a success with over 20 students in attendance to hear the discussion with a panel of professionals from varying geoscience disciplines and business sectors to answer questions from students.

PCPG has much in store for students in 2022. This year our annual meeting will include a traditional poster session and a live panel for students to share their concerns and questions on topics related to career path and soft skills (communication, interview strategy, and/or resume help). During 2022, PCPG will be developing new programs to help students connect with industry through job shadow experiences. PCPG is also planning to open a job board via the website and stands ready to provide support for additional student opportunities in 2022.

Membership

The Outreach Committee works very closely with PCPG membership and understands that continuing education and advocacy for the geosciences have a direct correlation to the quality work that PCPG geoscientists do throughout the state. We work closely with PCPG's Education Committee and relevant state agencies like USEPA, PADEP, PENNDOT, DCNR, etc. to provide relevant programs, webinars and podcasts that will keep our membership on the cutting edge of their fields of expertise. During 2022, the committee

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New PCPG Corporate Member

Please join us in welcoming our newest PCPG Corporate Member:

Musser Engineering, Inc.
an EARTHRES Company

Interested in becoming a PCPG Corporate Member? Visit our Join PCPG page, then download the Corporate Membership application. Bundling multiple Individual Memberships into a single Corporate Membership provides up to 25% discount for each professional enrolled. Telephone PCPG by dialing (717) 730-9745 for more information.

Building a Geoscience Learning Ecosystem for the Pennsylvania State System of Higher Education

Jonathan C. Lewis, Professor of Geography, Geology, Environment and Planning, Indiana University of Pennsylvania

A new **National Science Foundation** supported project aims to create a PA-based geology field camp that will be available to students from across the PA State System of Higher Education (PASSHE). The class will be unique in hard-wiring institutional partnerships that we expect may become a model for other state system geoscience programs.

What are we doing?

A team of geoscientists from Indiana, Edinboro, Kutztown, Shippensburg, California, West Chester, Millersville, Mansfield, and Slippery Rock Universities put their heads together to start building a 6-credit summer undergraduate Geology Field Class that will first run in Summer 2022. The class will serve as the backbone of a PA Geoscience Learning Ecosystem.

What does this mean?

We aim to develop relationships with high school teachers and local professional geologists to host outreach events in diverse communities as part of our class. The events would be partly facilitated by our undergraduate Geology Field Class students and will also serve to connect our faculty to high school teachers and local professionals. The goal of these events will be to showcase inspiring technologies and capabilities for addressing problems that resonate with the high school students, and that highlight the many meaningful career paths that geoscience provides. The class will be run every summer and will span the Commonwealth, serving as a core institutional component of the learning ecosystem. It will also showcase system behavior in PASSHE, leveraging faculty strengths and campus assets to provide exceptional learning opportunities for training future problem solvers using the world-class geology of Pennsylvania.

How will the partnerships work?

Because the class will run every summer, we hope to develop institutional partnerships in communities that the class has ready access to each summer. This will foster durable connections and reproduceable programming, simplifying participation by PCPG professionals. The most critical partners will be the high schools and members of PCPG because these will provide broader exposure to the relevance of geoscience. A team of faculty members that are not instructors for the class will take the lead on building the local partnerships, providing schedules, and coordinating the expectations.

Ideally PCPG members that are keen to contribute to the outreach events will develop relatively easy to deploy, but inspiring, demonstrations that can be run in a few hours. We hope that connections made with the high school students inspire them to consider majoring in geoscience. Our faculty champions will work to deepen these connections during the academic year. Also, during the events our geology students will meet PCPG members, and this will foster important network development, and even internship opportunities.

What's new here?

The novel dimension is a learning ecosystem that leverages PASSHE strengths, and that showcases geology more widely. The population of Pennsylvania is diversifying, and many communities have legacy environmental challenges. At the same time, the geoscience community that is trained to address such challenges is not diverse. The class aims to broaden participation so that PA has essential professional geology talent across the Commonwealth.

PCPG as an organization fully supports this endeavor. It is essential that we, as geoscience professionals, provide input to these universities and to the K-12 curriculum. PCPG encourages any corporate or individual members that may have an ability or a passion in education to join us in support of this project. If you would like to be involved, please email Outreach Committee Chair Vincent Carbone.

What does a Professional Geologist do for

Visit our
What Does a Professional Geologist Do
web page for more in this series.

PA COAL MINING INDUSTRY

A Professional Geologist (PG) investigates and characterizes the hydrogeology of an area for an underground or surface coal mine long before any mining begins in PA and monitors the site long after mining is completed.

- A PG determines the economic potential for a coal mine by planning a drilling program in a target area.
- The PG is responsible for logging the boreholes to describe the rock lithology and thickness, coal seam depths, fracture abundance and orientation, water conditions and the competency of the rock layers.
- Samples are collected and analyzed to determine the coal quality for the mine's economic potential and the coal and rock layers are analyzed for sulfur, acidity and alkalinity for environmental purposes.
- The PG correlates all the boreholes and determines the geologic structure including the dip or slope of the seam(s) which is important in designing the mine operations.
- The PG also collects or oversees an inventory and water sample on every well, spring, stream, wetland and any public or private water supply in the proposed mining area. In PA, a minimum of six months to two years of monthly data is collected depending on the type of mining.
- The water samples are analyzed for specific indicator parameters to establish the pre-mining water quality and pumping tests on some wells are performed to calculate the aquifer permeability.
- Detailed flow measurements along with macroinvertebrate studies may be done on perennial streams to determine the health of the watershed.
- The PG defines the limits of any wetlands and identifies avoidance measures or areas where additional wetlands could be constructed.

PHOTO COURTESY OF RON MUSSER, P.G.

A coal exploration borehole is logged by examining, describing and taking measurements on a continuous rock core.

- The PG analyzes and models all the water data collected along with drilling information to get a total picture of the pre-mining hydrogeology of the project area.
- A PG may help engineers design the erosion and sedimentation plans for disturbed areas. Water is collected during operations and directed into ponds for settling and/or treatment, as needed, to control sediment prior to releasing into a stream. A PG will identify low permeability natural clays that can be used to line these ponds to prevent water seepage into the groundwater.
- The mining plan is designed and reviewed with the pre-mining hydrogeology and adjustments are made to avoid or minimize any potential environmental impacts. If the coal or rock analysis showed acidic material, the plan includes measures to neutralize any acidy.

- The PG develops a comprehensive environmental monitoring plan to verify mining has no negative impacts. Some monitoring locations will be checked weekly, monthly or quarterly depending on the type of point and method of mining. The PG also identifies potential alternate water supplies.
- The PG compiles all hydrogeologic information including the analysis of potential effects and mitigation plans into the permit application. The PG applies their professional seal and signs the documents indicating they are taking ownership of the analysis and conclusions for submittal to the PA Department of Environmental Protection (DEP).
- The PG maintains communication with DEP personnel to clarify or provide any additional information, if needed, to meet all environmental regulations before a permit is issued.
- During and after mining the PG reviews and evaluates the monitoring data to determine if there are any mining effects and works with engineers and state regulators to correct any problems.
- A PG also investigates potential acid mine drainage (AMD) issues from old abandoned mines. An investigation involves researching old mine maps, measuring mine pool levels, collecting and analyzing water from the pool and nearby streams and determining how the acid water migrated to the surface.
- The PG works with a team of professionals to design an AMD treatment system that neutralizes acid mine water which can include injection of alkaline material, water filtration and settling ponds and/or construction of a wetland passive treatment system for low flow water conditions.
- Land subsidence can be an issue near historic abandoned mines. Professional geologists work closely with engineers to investigate, propose and help design corrective actions.

PHOTO COURTESY OF RON MUSSER, P.G.

Stream monitoring is done all year and in all weather conditions for a coal mining operation.

The PG typically works with engineers (civil, mining & environmental) chemists, soil scientists, biologists, construction specialists, and drilling professionals.

Work Resources:

AutoCAD/GIS and mapping software, current and historic map databases (geologic, topographic and underground mine maps), historical state and federal mineral resource reports, modeling and analysis software.

Work Environment:

Office and field work. Field work may entail irregular or evening/weekend hours visiting property owners and working in varying weather conditions throughout the year.

Helpful Skills & Experience:

Attention to detail, research skills, ability to speak professionally and cooperatively with the public, state and federal regulators, ability to compile and analyze large amounts of data, ability to visualize a map drawing in three dimensions.

Tools of the Trade:

Pumping and water sampling equipment, water bailers, flow meters, water level gauges, pH & conductivity meters, alkalinity/acidity test kits, chain of custody documentation. Various types of drilling rigs, i.e. rotary, core, auger, along with rock chip, core and split-spoon samples.

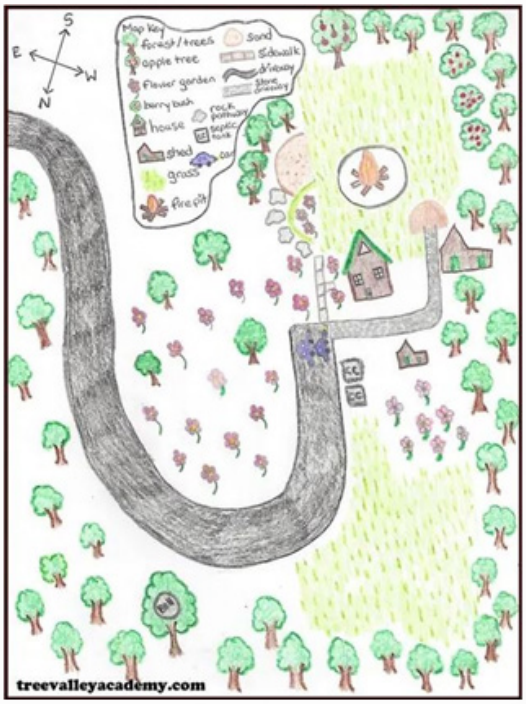
Kids' Geology Education: Mapping Your Favorite Place

Modified from: Tree Valley Academy

Mapping skills are crucial for a geologist. We strongly suggest that you, the adult and experienced professional, work with the child(ren) each step of the way, until they learn the mapping process. Once they can work independently, be sure to keep an eye on the child(ren) to ensure they are not working too close to a roadway or perhaps climbing to unsafe heights. Better yet, start the project with a "tailgate" safety moment!

Things you will need:

1. One large piece of paper or a few smaller pieces of paper taped together
2. Pencil and eraser
3. Colorful pens/markers/crayons
4. Ruler or tape measure (not required)
5. Compass (not required)
6. A solid surface for drawing on



Example Map from the treevalleyacademy.com

How to:

1. Before beginning, decide what place to map. It will help to create the map in this place so you can walk around and find all of the special things to include on the map.
2. Look over the area and pick a central object to be the first thing to draw. For example, to map your yard, start by drawing the house and build the rest of the map from there.
3. Use a pencil to sketch the map so you can make changes later.
4. As you walk around, scout possible landmarks to include. The best landmarks are objects or buildings that are permanent and unique.
5. Decide what other information to include on the map.
   a. Use symbols to represent common features.
   b. To map a place outdoors, include the different plants, animals, benches, swing sets, rocks, campfires, flowers, ponds, creeks, grass, sheds, mailbox, driveway, cars, etc.
   c. To map a place indoors, include furniture, doorways, indoor plants, artwork, windows, stairways, pets, etc.
6. Pay attention to how far between and in what direction landmarks and features are from each other.
   a. Use the ruler or tape measure to measure the distance between objects or count the number of steps from one location to another.
   b. Use the compass to see the direction you are walking and to draw the landmarks and features in the right location.
7. Add a legend to your map identifying the different symbols to help the reader understand what the symbols represent.
8. Draw the compass directions on the map to help position the objects correctly.
9. Last but not least, use the markers and crayons to make your map colorful, then share the map share with friends and family.
10. For an added layer of fun, add an x to the map and have your friends/family follow your map to find where "X marks the spot." Have a surprise waiting for them.

OUTREACH COMMITTEE *Continued from Page 3*

plans to assist the Education Committee to bring in diverse speakers from varied geoscience backgrounds relevant to our membership. Provided the COVID landscape cooperates, we plan to welcome all members back to our "Continental Drifters" events. These events, often held at a local restaurant, after other PCPG sponsored engagements, provide an opportunity for professionals and students to network in an informal environment.

Community

During 2021, PCPG provided comment and feedback to the Pennsylvania Department of Education on their revised Academic Standards for Science Education in the K-12 school community. Over several public opinion sessions, PCPG provided feedback stressing the need for geoscience education. PCPG communicated the need for both core curriculum education on geoscience topics and the need for hands-on programs to teach applied geosciences.

In fall of 2021 and to continue in 2022, PCPG will be assisting the Pennsylvania State System of Higher Education (PASSHE) in their GeoSLiP STREAM (Geoscience Service Learning in PA - STEM Readiness for All Municipalities) Program. Nine Pennsylvania universities from the PASSHE system have acquired a grant to fund geoscience education for both college and K-12 students to learn and/or develop geoscience skills. The grant will fund several programs and activities across the state promoting geoscience education. Educational programs will be developed in strategic areas of the state with plans to expand in future years.

If you or your organization want to learn more or be part of the PCPG Outreach Committee please email me.

Can You Identify this Mineral?

Emily Glick, P.G. (Tetra Tech), PCPG Communications Committee Co-Chair

Answer:

Celestine - strontium sulfate:

a mineral appearing as sky-blue or white orthorhombic crystals or in fibrous masses.

The Commonwealth of Pennsylvania does not have an official State mineral. In fact, Pennsylvania is the only state that does not have a state mineral, rock, or gemstone. Some groups, such as The Nittany Mineralogical Society, supported HB564 proposed in 2015 to designate celestine as the official State mineral, but the bill moved slowly and expired before it could be passed.

Celestine derives its name from Latin caelestis, meaning "heavenly," in allusion to the beautiful sky-blue color of the first specimen from this Commonwealth. Celestine grows as large, clear crystals that can be faceted into gems. With the same brilliance as topaz, celestine crystals are lovely gemstones. Celestine is also a major ore for strontium, whose compounds are responsible for the bright red flames in fireworks and road flares.

Celestine was first discovered in Bellwood, near Frankstown, Blair County, PA in 1791. Celestine has since been found throughout central Pennsylvania in East Salem, Juniata County; Lime Bluff, Lycoming County; Meckley's Quarry, Northumberland County; Allenport, Huntingdon County; and Faylors Middle Creek Quarry, Mifflin County.

Another attempt was made to designate amethyst as the official State gemstone, and to designate celestine as the official State mineral in 2019, but the bill expired at the end of the 2019/2020 session year. As stated in paragraph 17 of HB1282, designating celestine as our State mineral would remind the residents of Pennsylvania that our Commonwealth boasts a rich natural history that is marked by a mineralogy of great beauty and diversity. Designating a State mineral would provide a positive experience to countless school children whose interest in Pennsylvania history and geology will be piqued.

When researching for this article, I assumed that Pennsylvania had an official State mineral and gemstone. Pennsylvania recognizes 21 official symbols, including our state fossil, the trilobite. "State objects fundamentally are symbols of celebration – of a region's heritage, its natural resources, and its economic foundation. They also provide a powerful means for educating students about the contributions that a state has made to science and industry," said Peter J. Heaney, Penn State professor of mineral science.

DEADLINE FOR OUR NEXT NEWSLETTER IS APRIL 10, 2022

Articles are suggested to be about 700 words maximum. For more information, contact our PCPG Newsletter Editor and Communications Committee Co-Chair - Emily Glick, P.G., by eMail.

PCPG ASSOCIATE AND CORPORATE MEMBER SPONSORSHIP RATE

(Rates are listed as amount per issue)

Size	Commitment:	1x	4x
1/2 Page Horizontal (8" x 4.7")		$225	$150
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1/4 Page Vertical (3.875" x 4.7")		$185	$150
Business Card (H or V)		$100	$80

ADS MUST BE SUBMITTED AT CORRECT SIZE AS STATED ABOVE AND MUST BE PRINT-READY, 300 DPI
FILE FORMATS ACCEPTED: .PDF, .TIF, .JPG, OR .PNG

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