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## MESSAGE FROM THE PRESIDENT



### ACTION PLAN

We are having a real heat wave this summer. As geologists, we work outdoors every day and always need to be prepared. Everyone's heard the safety talks for the summer hazards: drink plenty of fluids, apply sunscreen and tick repellent, wear breathable fabrics and take frequent breaks. We need to add another year-round safety item to the list: an action plan for field workers in today's racially charged climate.

Whether you are doing field work in an urban or rural area, geologists need to be conscious not only of the surrounding natural environment but also the people that may be encountered. We all have stories about meeting someone in the field that was \_\_\_\_\_ (fill in the blank based on your own experience... really crazy, almost naked, very aggressive, etc.) It makes for a great story, but not many of us as geologists have been truly afraid for our lives simply by doing our jobs. What many people don't realize is that people of color also need to be prepared for racial bias when doing field work. We found this YouTube post on the [Hazards of Field Work While Black](#) and reposted it to our [PCPG Facebook Page](#). The young man describes feeling quite anxious while working after some people start eyeing him very suspiciously.

PCPG is working on a podcast with this young man and others to further explore this very relevant subject in our field. Ultimately, employers need to consider this issue before putting their employees in a potentially harmful situation. Have a conversation now with your staff and develop an action plan to address any potentially compromising situations. The conversations need to continue with open dialogue and feedback from both sides. It is a very difficult subject but an extremely important safety issue.

Perhaps the reason many of us haven't encountered this situation is that racial-ethnic minorities and women are still underrepresented in geology, as is the case in many other scientific disciplines. Studies have shown that a diverse workforce brings different experiences and perspectives leading to greater innovation, better decision making, higher engagement and greater employee retention in the workplace. A

*Continued on Page 4*

# UPCOMING PCPG EVENTS

**August 25, 2020**

Orphan and Abandoned Oil and Gas Wells in Pennsylvania (60 mins.)

**Webinar**

**September 18, 2020**

**CANCELLED**

The Big Picture: Geologic and Environmental Applications of Drones

**Cranberry Township, PA**

**September 22, 2020**

Recent Advancements in UAS (Drone) Technologies for Geologists and Allied Fields (60 mins.)

**Webinar**

**If you would like to develop and present a PCPG webinar topic, or have a topic to suggest, please email [Dan Billman, P.G.](#), PCPG Education Chair.**

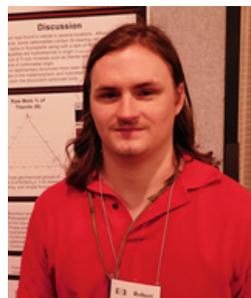
**For a complete list of upcoming events or to register online, check our [HOME PAGE event calendar](#), or visit [PCPG'S COURSES AND EVENTS web page](#).**

## 2020 ANNUAL MEETING STUDENT RESEARCH COMPETITION

The annual PCPG student research poster competition challenges undergraduate college students who do original, extracurricular research. Students must ask novel geologic questions, creatively design a scientific research project that will potentially answer that question, execute that plan, and analyze the resulting data. Dozens of students from Pennsylvania and adjacent states submitted abstracts of their work from which the 10 most promising studies were selected for presentation at our annual meeting. Students computer-drafted 4 ft x 8 ft posters reporting their work, then verbally explained their work to interested PCPG members. Judges interviewed each student individually, then assessed each student's understanding of their project and thoroughness of the research using a standardized rubric. The panel of six judges, who are professional geologists with diverse geological backgrounds included Emily Glick, P.G., Kelly Kinkaid, P.G., Andrew Klingbeil, P.G., Gary Kribbs, P.G., Jay Parrish, Ph.D., P.G., and Lane Schultz, Ph.D., P.G. Each of the 10 students received a stipend of \$300 to help defray printing costs and pay for their travel to the conference. Poster Competition Committee Chairperson Richard Wardrop P.G. organized the event, which ran more smoothly than the surface of glaciated chert.



**ELIZABETH DRISCOLL** – a senior at [Franklin and Marshall College](#) won first prize (\$1,500) for her study of Quaternary climate change recorded in freshwater tufa deposits (carbonate mineral-depositing springs on lake floors) in the Atacama Desert of Chile. Her study integrated field work, optical petrography, stratigraphy, XRD, ICP, and stable isotope data.



**ROBERT EDRIS** - a [Kutztown University](#) senior, Edris won second prize (\$750) for his work studying the mineralogy of discordant carbonate bodies in the Imerys wollastonite ore body in New York. Using electron microscopy with EDS chemical analyses to constrain micron-scale mineral compositions, he tested whether these bodies were igneous carbonatite dikes or metamorphic remobilization of marble country rock.

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## PCPG GOVERNMENT AFFAIRS COMMITTEE: WHERE IT STARTED AND HOW PCPG KEEPS ITS MEMBERSHIP INFORMED

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

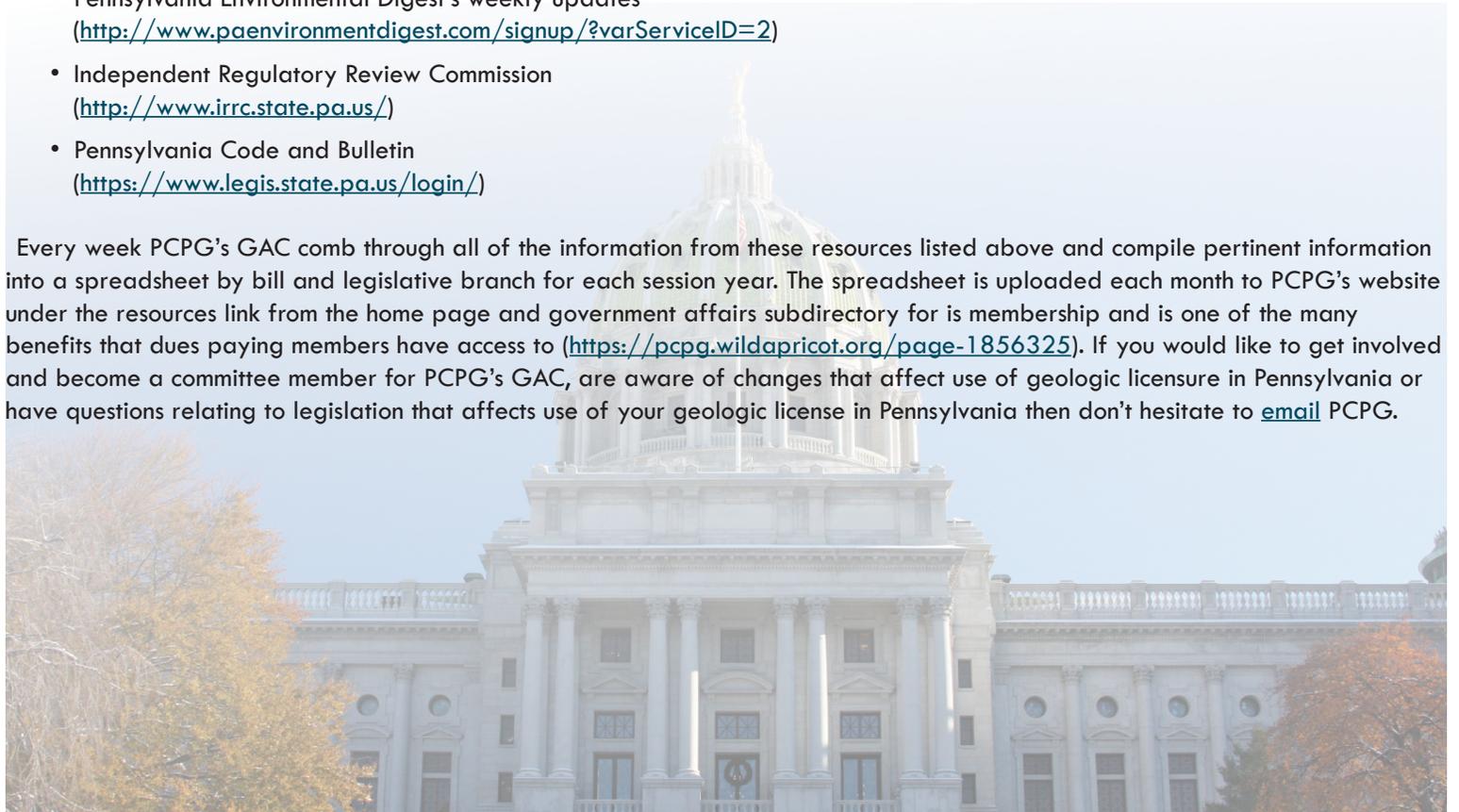
Not long after PCPG's foundation in 1989 and Pennsylvania's acceptance of geology as a professional license in 1992, PCPG established the Government Affairs Committee (GAC). PCPG's GAC was formed in order to monitor for, keep track of and report legislation that directly affects PCPG's membership and licensed geologists working in Pennsylvania.

During GAC's formation the World Wide Web, accessed via the internet, was still very much in its public infancy. Therefore, the way in which PCPG's GAC has kept track of legislation has evolved over the years. At present day, PCPG's GAC utilizes the Pennsylvania General Assembly website (<https://www.legis.state.pa.us/>) in conjunction with Really Simple Syndication (RSS) feeds. At this website you will find a whole host of information from when future legislative sessions will occur in the House or Senate, proposed bill details, voting results from each session, transcriptions from the floor at each session, legislative committees and its members, representative bio's, district maps, Pennsylvania statutes (consolidate and unconsolidated) and a link to the Constitution of Pennsylvania. Under the legislation tab at the top is where you can search and setup RSS feeds direct to your email by whatever criteria you choose within the given options listed. For those that just want a simple notification email you can sign up under the login tab at the top of the website.

Aside from the Pennsylvania General Assembly website, PCPG's GAC sources information from numerous Pennsylvania web sites to keep track of important changes for licensed geology professionals working in Pennsylvania and its membership:

- PADEP Advisory Committee's (includes subcommittee's within cleanup and brownfields) (<https://www.dep.pa.gov/PublicParticipation/AdvisoryCommittees/Pages/default.aspx>)
- Environmental Quality Board (<https://www.dep.pa.gov/PublicParticipation/EnvironmentalQuality/Pages/default.aspx>)
- Pennsylvania Environmental Council (<https://pecpa.org/>) which also has a bill tracker (<https://pecpa.org/pec-bill-tracker/>)
- Pennsylvania Environmental Digest's weekly updates (<http://www.paenvironmentdigest.com/signup/?varServiceID=2>)
- Independent Regulatory Review Commission (<http://www.irrc.state.pa.us/>)
- Pennsylvania Code and Bulletin (<https://www.legis.state.pa.us/login/>)

Every week PCPG's GAC comb through all of the information from these resources listed above and compile pertinent information into a spreadsheet by bill and legislative branch for each session year. The spreadsheet is uploaded each month to PCPG's website under the resources link from the home page and government affairs subdirectory for its membership and is one of the many benefits that dues paying members have access to (<https://pcpg.wildapricot.org/page-1856325>). If you would like to get involved and become a committee member for PCPG's GAC, are aware of changes that affect use of geologic licensure in Pennsylvania or have questions relating to legislation that affects use of your geologic license in Pennsylvania then don't hesitate to [email](#) PCPG.



## PRESIDENT'S MESSAGE *Continued from Page 1*

study\* published in *The Harvard Business Review* looked at unconscious bias in gender and race. This study manipulated the names of job candidates with the same credentials by using typical female or male names and then names that “sound stereotypically black or white.” When only one person from an underrepresented group was in the candidate pool, there was almost no probability of being hired; whereas by increasing to two per candidate pool the chances of hiring increased dramatically. The authors suggest deviating from the norm may be uncomfortable for some decision makers, yet a pool including two qualified diverse candidates redefines the norm and decision makers feel more comfortable choosing a diverse candidate.

In my own experience when hiring, there were often no candidates of color and very few women. The love of science often starts at a young age and one way to encourage that interest is by volunteering to help with regional science fairs. High schools and universities can do more to encourage underrepresented groups into geology and other science careers by highlighting people of color and women in these disciplines. As professionals, we should try harder to recruit more diverse candidates and be aware of unconscious bias. Try to interview two underrepresented candidates per position and also create a welcoming environment for all new hires. Although I cannot relate to the issues people of color experience, for many years, I was often the only woman in the room. It seems as if all eyes are on you which can be quite daunting and intimidating especially when young and inexperienced. We can start by trying to make everyone in the room feel welcome by starting a conversation, asking about their experiences and interests, encouraging participation in the discussion and most importantly listening to everyone's point of view.

Best Regards and Stay Safe,



Barbara J. Dunst, P.G., PCPG

*\*If There's Only One Woman in Your Candidate Pool, There's Statistically No Chance She'll Be Hired, Stefanie K. Johnson, David R. Hekman and Elsa T. Chan, Harvard Business Review, 4/26/2016.*

Additional Resources:

[Small Business Chronicle Workplace Diversity](#)

[Lifespeak 15 Steps to Build a Diverse Workforce](#)

[LinkedIn Talent Solutions Small Business Diverse Inclusive Hiring](#)

## STUDENT RESEARCH *Continued from Page 2*

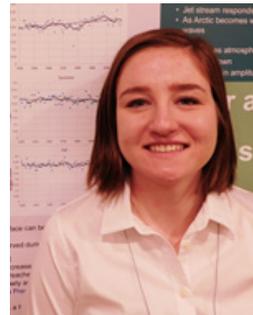


**ANGELO TARZONA** - [Dickinson College](#) junior Angelo Tarzona mapped the structure of soil solifluction lobes in the Susquehanna Hills using 2D seismic tomography.

**BRITNEY FLATEN** and **IAN WACHINO** – [Franklin and Marshall College](#) seniors – quantitatively measured the physical and geochemical effects of freeze-thaw erosion on a model stream bank



**LARA ILSEMANN** - [Kutztown University](#) senior Lara Ilsemann measured the stratigraphy of fluvial microbialites (fossil algal mats from a Cretaceous stream in what is now Utah) and characterized their morphology to determine if thrombolite or stromatolite morphology prevails in environments with different sedimentation rate.



**KAITLIN KARAFFA** - [Slippery Rock University](#) senior Kaitlin Karaffa analyzed historical weather data to determine what might be causing the increase in the “wiggleness” of the jet stream over the past 70 years.

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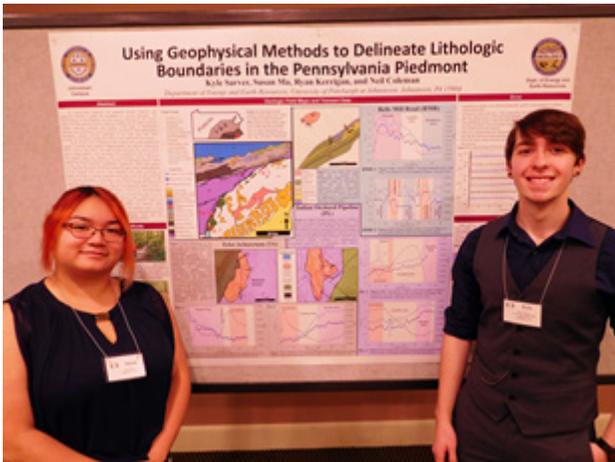
## STUDENT RESEARCH *Continued from Page 4*



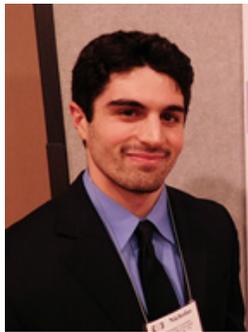
**KYLE KREZDORN** – [Kutztown University](#) senior - presented his correlations of vibracores he sampled in a profile across Swans Cove Pool - a salty pond on Assateague Island barrier island in Virginia.



**ALEXANDRA ASPEY** - a [Wilkes University](#) senior, Aspey studied the oxygen isotopes recorded in lake core sediments to constrain the climate in Newfoundland during the past 1,500 years.



**SUSAN MA** and **KYLE SARVER** at [University of Pittsburgh at Johnstown](#) correlated magnetometer and EM data they collected across mapped geological contacts hidden beneath Piedmont sediments to check the reliability of the projected contacts in thick cover.



**NICHOLAS CRESCENZO** - [Pennsylvania State University](#) senior Nicholas Crescenzo analyzed the Mercer Formation in Clearfield County, PA as a potential source of lithium - a metal which is experiencing a world-wide rush due to high demand for batteries, ceramics, and lubricants.

## STUDENT MENTORING WORKSHOP

### HOW TO BECOME A PROFESSIONAL GEOLOGIST AND A VALUABLE HIRE

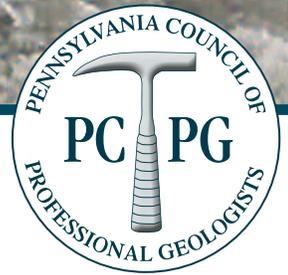
This year, in addition to the student poster competition, PCPG organized a student mentoring workshop. Although colleges may be great sources of book-learning, young people are hungry for mentors who are professional geologists working in the field. How can I best use college to prepare for a career? Where do I look to find a job? What is the interview process like and how can I make a good impression? Once hired, what can I do to succeed as a professional? What do I need to do to earn my PG license? When should I diamond drill core instead of going for cheaper RC chips? The PCPG board members Vincent Carbone P.G., Emily Glick P.G., Russ Losco, P.G. C.P.S.S., and Martin Helmke Ph.D., P.G. held a special workshop breakout session with 15 college students who attended the meeting to give them honest advice. By all accounts, students found the workshop very helpful.

*“It was great to hear actual professional geologists discuss hard and soft skills that are important to the industry such as what to do and not to do in an interview, and how to get started in a professional career. I liked that they had experience that ranged from several decades, to several years, with academic and purely private sector perspectives (often both in the same person). It’s nice to get advice that I can be confident is relevant and accurate.”*

– David Muller - Kutztown University senior

**What does a  
Professional Geologist  
do for an**

Visit our  
**What Does a Professional Geologist Do**  
[web page](#) for more in this series.



## OIL/NATURAL GAS WELL SITE

A Professional Geologist (PG) characterizes the baseline hydrogeology to design and permit an oil or natural gas well drilling site (well site) and investigates any potential environmental issues.

- A team of professionals including a PG interprets numerous data sets often using mapping software to identify a potential well site. The data collected can include surface geology, topography, floodplains, water bodies, water wells, cultural features and regulatory setback requirements.
- A PG reviews and evaluates geotechnical borings, soil samples, wetland areas and any water sources at risk, if any, to prepare an Erosion and Sedimentation (E&S) permit which is required before constructing a well site. A PG may also assist with slope stability issues when construction activities encounter water drainage from seeps or springs.
- To obtain a permit to drill, a geologist evaluates the underlying rock strata along with a drilling engineer to pick the depth that various casings will be placed to separate and isolate the well from fresh water, underground coal mining, and other oil/gas bearing strata including storage zones. Typically, three to four steel casings of increasingly narrower diameter are cemented in place prior to drilling to a target zone.
- A water supply or pre-drill survey is conducted to document private/public water wells, springs, and ponds within a predetermined radius (PA's radius is 2500 ft.) of a well site.
- At least one sample is collected from every water supply approximately three to six months prior to drilling and analyzed for methane, dissolved gasses and other chemical indicators of water quality to establish a baseline water chemistry dataset. If necessary, isotopic gas analysis may be added.
- The PG reviews and evaluates the pre-drill sampling data for trends and patterns including any anomalous results. The info is then collated and submitted to the state regulatory agency.
- Sometimes elevated levels of naturally occurring parameters are found pre-drill that exceed primary and/or secondary maximum contaminant levels set by regulatory agencies and homeowners are advised of the safety hazard (if any) along with suggestions for remedial action.
- The pre-drill water survey and sampling is repeated prior to returning to that well site if all drilling is not completed in one continuous time period.
- Any water supply complaints are thoroughly investigated by a PG and reported to the Department of Environmental Protection (DEP) within the designated regulatory timeframe, currently 24 hours in PA.
- The PG may perform an on-site mechanical evaluation, resample to compare with the pre-drill baseline data and/or run a pumping test if the complaint is a water quantity (yield) issue.



Marcellus Shale hydraulic fracture treatment, Western PA. The liner under all the equipment would contain any accidental spills so the groundwater won't be impacted.

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Drilling pad and pipeline construction, Marcellus Shale, Western PA. Rock lined ditches and filter sock around the perimeter contain any water and soil runoff from the site.

- If the complaint pertains to a gas migration issue, the PG also evaluates all well construction details, including the water well and nearby gas wells for potential leakage pathways. In some instances, a detailed isotopic analysis of the gas chemistry is conducted to determine the origin of the gas.
- The PG evaluates other well site conditions such as the location and distance to the drill site, full timeline of the drilling compared to when the water well issues began, and downhole problems reported during drilling to determine the cause of any water supply issue.
- Other data that might be needed include rainfall and climate info, historical aerial photos, pertinent literature along with other possible contaminant sources such as septic tanks, farm manure runoff, mining, unauthorized dumps and any new industrial facilities or activities in the area to get a total hydrogeologic picture.

- The PG evaluates and characterizes all the relevant geologic data and rock properties like porosity and permeability to identify potential pathways for contamination and/or gas migration.
- Although not a common occurrence, a PG also investigates surface spills or releases of fluids at well sites and other facilities. Sufficient soil and/or water data to delineate the affected area is collected and evaluated then the PG helps to develop a remediation or treatment plan for the impacted area.
- The PG prepares a full report of any investigation and sends it to the DEP which includes the data, analyses and conclusions from the investigation.

**The PG typically works with engineers (production, drilling, completion, well plugging and civil), chemists, geochemists, construction specialists, soil scientists, biologists, remediation specialists, land personnel, permitting professionals, attorneys and property owners.**

### **Work Resources:**

Computers, investigative reports, GIS/mapping, hydrologic modeling & analysis software.

### **Work Environment:**

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

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

Attention to detail, research skills, landowner relations, DEP negotiations, ability to explain technical material to non-technical personnel, grasp of legal issues, familiarity with water well components and operations, geochemistry evaluations, oil & gas operations and permitting processes.

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

Methane meters, pumping equipment, flow meters, water level gauges, pH and conductivity meters, water/soil sampling equipment and chain of custody documentation.

## DEADLINE FOR OUR NEXT NEWSLETTER IS OCTOBER 15, 2020

For more information, contact our PCPG Newsletter Editor and Communications Committee Co-Chair - Tiffani Doerr, P.G., by [eMail](#) or telephone at 302-477-1305.

### 2020 PCPG MEMBER SPONSORSHIP RATE

(Rates are listed as amount per issue)

Size	Commitment:	1x	4x
1/2 Page (8" x 5")		\$225	\$150
1/4 Page (3.875" x 5")		\$140	\$95
Business Card (H or V)		\$75	\$50

### 2020 PCPG NON-MEMBER SPONSORSHIP RATES

(Rates are listed as amount per issue)

Size	Commitment:	1x	4x
1/2 Page (8" x 5")		\$300	\$240
1/4 Page (3.875" x 5")		\$185	\$150
Business Card (H or V)		\$100	\$80

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PCPG, 116 Forest Drive, Camp Hill, PA 17011

## NEW PCPG CORPORATE MEMBERS

Please join us in welcoming our newest  
PCPG Corporate Members:

**Tetra-Tech**

**Princeton Geoscience, Inc.**

Interested in becoming a PCPG Corporate Member? Visit our [About](#) 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.

## IN MEMORIAM

### Sean Michael Sherlock

July 20, 1963 - July 23, 2020

Sean liked many things - geology, history, he played rugby in college, cooking, cars, and being outdoors to name a few. Sean was a quiet, soft-spoken man who would help anyone whether it was to explain the geology or set up a tent. He was also a father, a student, a teacher, a friend, a roommate, and a very good geologist.

He was "old school." All he needed was a Brunton compass and a topo map. While in Arizona pursuing his master's degree, Sean would camp in the desert mapping the geology. But he also embraced new technology since it does make life and work a little easier.

We kept in touch through the years and when we spoke on the phone or met at a conference, the conversation continued as if no time had passed since the previous conversation. He will be missed by many.

(submitted by Samuel H. Baughman II, M.S., P.G.)

## PCPG's ASSOCIATE MEMBER FOR 2020:



Elk Environmental  
Contact: Jesty Newswanger  
Phone: (610) 372-4760



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