

# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 1

Robert Botterman, Editor

September, 2013



Wednesday, September 18, 2013

The Pittsburgh Geological Society presents

## *LEAVING GONDWANA*

**Dr. Allen Dennis, University of South Carolina, Aiken Campus**

The Kings Mountain belt of the South Carolina-North Carolina Piedmont has been identified as a large relatively intact portion of the Carolinian Middle Cambrian and younger Rhenish margin, forming as Carolina rifted from Gondwana. This interpretation is supported by detrital zircon (laser ablation and ID-TIMS) and chemostratigraphic studies, and helps explain some unusual stratigraphic features of the terrane. This event occurs as the middle chapter of a history that includes rifting of an intra-oceanic arc, collision of two arc terranes with the preservation of relict eclogite facies assemblages (before), and accretion to Laurentia (south of the New York Promontory), erosion to form a late Silurian successor basin, collapse of that basin to the Laurentian margin during Late Devonian orogeny, prior to 500 km of dextral strike slip motion, and ultimate Lower Pennsylvanian emplacement of the composite Piedmont/ Blue Ridge crystalline thrust sheet (after). This talk will focus on the Rhenish margin chapter but include enough of the earlier and later chapters to explain many of the features of the Southern Appalachian Piedmont.



Allen Dennis has taught at the Aiken campus of the University of South Carolina since 1988, following M.S. and Ph.D. graduate work at the Columbia campus. Over the past 30 years he has supplemented his detailed mapping with mathematical/geometric techniques, whole rock and mineral chemistry, and a variety of U/Pb techniques and isotopic tracers to solve tectonic problems primarily in the southeastern Appalachian Piedmont, but also in the California Coast Ranges and the Swat Valley of the Pakistan Himalayas. In 1994 he was recognized with the Biggs Earth Science Teaching Award by the Geological Society of America. In 1995 he was named a Governor's Distinguished Professor by the South Carolina Commission on Higher Education. In 2002 he held the Whitnall Chair in Geology at his alma mater, Colgate University. In 2010 he was named a Carolina Trustee Professor by the Board of Trustees of USC. Allen is married with two children, and is active as a USA Swimming Referee and as a Scouting volunteer in the Georgia-Carolina Council of the BSA. Jim Hibbard and Hank Williams started Allen playing the 5 string banjo, and he is an enthusiastic, relatively unskilled player.

**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at; [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, September 16.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

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## **PGS PRESIDENT'S STATEMENT**



I am honored to serve a third term as your president and look forward to working with the board and members to advance ideas and programs that can ensure the long-term success of The Pittsburgh Geological Society.

The service and assistance of William Gould our outgoing Secretary, as well as Maury Deul and Charlie Jones, Directors at Large have been greatly appreciated. We welcome Judy Neelan as Secretary and three Directors at Large (serving two full terms), Robert Botterman (who continues as editor), Ken LaSota, and Tamra Schiappa. A special recognition goes out to Mary Robison as the recipient of the Walt Skinner Award and to Ray Follador as PGS Honorary Member.

Vice President Kyle Fredrick chair of programs invited many interesting speakers and has many more planned for 2013 – 2014.

At the June changeover meeting the board discussed ways to improve our communications (newsletter and speaker system upgrades), public education for students and public requests and corporate support initiatives. For example, members of the board

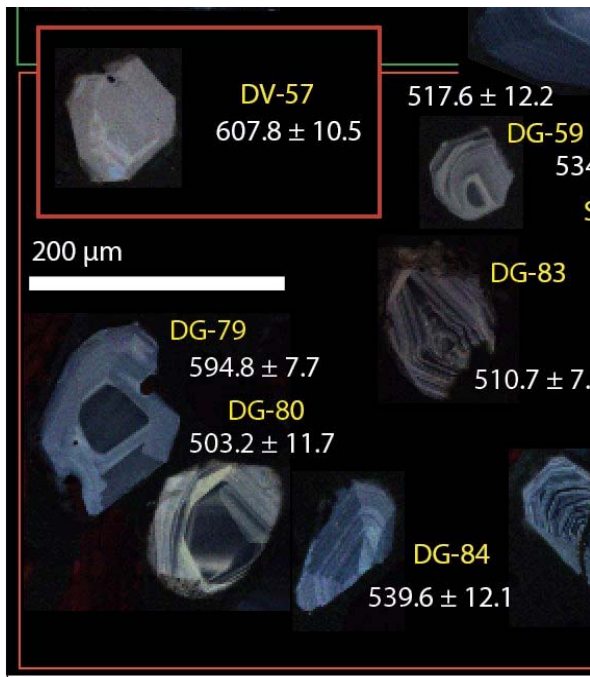
recommended reformatting the Newsletter from the former four pages to a larger format where members can share stories on teaching and research, student profiles and events, and other activities relevant to the PGS mission. The PGS web pages are in need of updates and change; Erica Love and Mary McGuire are open for suggestions.

The PGS Board and members continued to support professional meetings at the AAPG Eastern Section in Cleveland, Ohio and National AAPG Pittsburgh PGS sponsored Convention Field Trips, Student and Teacher Programs. Members participating included, Katharine Lee Avary, Frank Benacquista, Kathy Flaherty, Ray Follador, Kyle Fredrick, John Harper, Albert Kollar, Dan Billman, and Andrea Reynolds our two AAPG Delegates.

Our public education initiatives; (student night and their dinners, field workshop, spring field trip and the Carnegie Science Fair where Steve McGuire and John Harper served as judges, have been heavily subsidized by the Membership, Corporate, and Galey funds. The PGS spring field trip to the kimberlite dike near Masontown, Fayette County, and Pleistocene age Carmichaels Formation in Carmichaels, led by John Harper and Henry Prellwitz was another success. Two 12-passenger vans were filled. The two day Student Field Workshop in April was held at SAI Farm facility of California University of Pennsylvania, Dominion Foundation graciously sponsored the event. Instructors on hand, including Steve McGuire, Steve Pesch, Kyle Fredrick, and Frank Benacquista, shared their knowledge with 40 students in attendance. PGS is helping to cover student participation in this year's Field Conference of Pennsylvania Geologists, Williamsport, Pennsylvania.

Total membership stands near 300 with eleven university geology departments represented by 71 students an all time high. The board welcomes ideas, suggestions, and donations.

Sincerely,  
Albert D Kollar



"Cathodoluminescent image of some Battleground Formation detrital zircons dated at Arizona Laserchron Center

## OF INTEREST

A paper in *Nature* describes how nickel in olivine crystals suggests that magma generated in the mantle rises through 35 km of crust, mixes with basaltic andesites, and erupts, all within a surprisingly short time scale of months to years. This suggests that geoscientists should look deep to spot the first signs of volcanic unrest at convergent boundaries.

## ORIGINS OF WESTERN PA PLACE NAMES

Conneaut is a very popular name. It is a creek, a township in Erie County, and a town in eastern Ohio, as well as a lake and the town and amusement park associated with it. All of these derive their names from a corruption of the Delaware Indian *Gunniati*, which means "it is a long time since they are gone". Conneaut Lake is a kettle lake, formed when a large block of ice was left behind and melted when the glaciers retreated about 10,000 years ago. The lake sediments have yielded the bones of both woolly mammoths and mastodons. The town of Conneaut Lake was founded in 1799 as Evansburg, but the name was changed in 1892, the same year Conneaut Lake Park was opened. In addition, there is an Upper Devonian stratigraphic unit called the Conneaut Group (or Formation) that was named by Kenneth Caster in 1934 for exposures along Conneaut Creek in Erie and Crawford counties.

## PGS PROFESSIONAL MEMBER FEATURE

A new feature this year will be highlighting one of our professional members each month. Our first victim, er, volunteer is Ray Follador. Look for the same treatment for a student member in the coming months.

### 1. Name/certifications:

Raymond M. Follador  
PA CPG 632G  
AAPG CPG 4462  
AIPG CPG 7093

### 2. Company, title or role, years with company:

ARK Resources, Inc., President & Principal, 15 years.

### 3. How long have you been a member or PGS?

31 years (1982).

### 4. Have you held any officer positions (can you remember when)?

President: 1996 & 2005, Vice President: 1995 & 2004, Treasurer: 1994, Secretary: 2007 & 2008

### 5. Education:

B. S. Earth Science, Pennsylvania State University, 1979  
M. S. Geology, West Virginia University, 1993

### 6. What are some of your day to day responsibilities in your current role?

Prospect Generation and Development, Management of Land & Leasing, Negotiating pipeline ROW's and the placement of unconventional (shale) resources into industry activity.

### 7. What is the best and worst thing about your current job?

Best: Freedom to make my own decisions and being involved in the operations of the industry.  
Worst: not practicing geology as much as I did when I was only a geologist.

### 8. What was your first geology job out of college or weirdest geology job and is there anything you would like to pass on?

Initial Job: chasing a drilling rig for 2 years in the Mid-Continent and describing and preparing core nonstop. I never had a weird geology job but I guess they exist. To pass something on: 1) learn how to contour by hand before you learn how to contour by computer; 2) Learn everything you can during your career about the economics and

operations of the industry you are working in and the company you work for. The business is bigger than the geologic duties we perform for our livelihood. The object is to be employed so you can be an active geologist.

9. **What is your dream geology job?**  
I'm living it. I always wanted to have ownership in what I do.
10. **What is your favorite PA geology site/fun fact/phenomenon, etc.?**  
Driving Route 99 from Altoona to State College along the Allegheny Front.
11. **What is one thing you wish someone would have told you when you were starting out in the geology profession?**  
Sleep deprivation is part of the deal and the hours can be unpredictable.
12. **What is one class you wish you would have taken in college? (doesn't have to be a geology class).**  
Exploration Economics (if it even existed at the time).
13. **What is the most exciting place you have been geologically?**  
National Parks (Yosemite, Rocky Mountain, Joshua Tree, etc.)
14. **What is your favorite or least favorite "Bad" geology movie and why?**  
"Monolith Monsters" is my favorite geology movie thriller. A 1957 sci-fi B movie with the geologist saving the day. His tools/props are very authentic (they did some research). Check out the trailer on YouTube.
15. **What's your favorite rock, mineral, or fossil?**  
Anything that displays paleodeposition. A story in every rock.
16. **What's the #1 most played song on your iPod?**  
Not sure what the song title would be but I'm sure the music was composed by Jerry Garcia.
17. **What is one of your favorite quotes?**  
"To lose our tranquility will not hurry geology; nothing hurries geology." From Mark Twain's Letters from the Earth.
18. **If you could choose anyone, who would you pick as your mentor?**

**Too many to name. Mentors should be a patchwork quilt.**

19. **If you could meet any geologist, living or dead, who would you meet?**  
Alfred Lothar Wegener.
20. **Anything else you would like to share about yourself?**  
I give to the PGS Galey Fund. Do you?

#### **DID YOU KNOW . . . ?**

- Large volcanic eruptions can affect Earth's climate for years. The eruption of Mt. Pinatubo in the Philippines in 1991 produced more aerosols than any eruption since Krakatoa in 1883, enough to drop global temperatures by about 0.9 °F and help increase depletion of the ozone layer, at least temporarily.
- A new study suggests that the end-Triassic extinction, which allowed the dinosaurs to flourish and take over the world for 150+ million years, was caused by volcanic activity that changed Earth's climate. The extinction and volcanic events were both dated to 201.56 million years ago.
- The 62-mile-wide Popigai crater formed about 36 million years ago when an asteroid thought to be 3 to 5 miles wide slammed into what is now Siberia. The impact created trillions of carats of diamonds, enough, supposedly to supply the world's diamond market for the next 3,000 years.
- A highway-widening project in the Laguna Canyon in California between 2000 and 2005 uncovered fossils of hundreds of marine mammals that lived 17 to 19 million years ago, including whale fossils that scientists have identified as several new species of early toothed baleen whales.
- Canadian scientists have discovered a bacterium called Delftia acidovorans that, when infused within a toxic mixture of water-soluble gold, excretes a protein that protects it from the poisonous environment and, at the same time, transforms the toxic ions into solid gold particles.
- Hoodoos, those tall spires of relatively soft sandstone typically found in arid regions, might help put limits on ground motion associated with recent earthquakes through an understanding of the minimal forces necessary to break the shafts.
- The European Space Agency released a study in February showing that Arctic sea ice volume is declining, rather than just sea ice coverage. Since 2003, Arctic sea ice has declined by 36% during the fall months and 9% during winter months, with the greatest decline occurring during summer months.

- Supernovae generally are divided into two categories: 1) white dwarf supernovae, also known as type IA; and 2) core-collapse supernovae, which occur when very massive stars (>8 times the mass of the Sun) explode because their cores can no longer withstand the pressure of their own gravity.
- An 8.0-magnitude earthquake struck off the Solomon Islands in the South Pacific in February, triggering a tsunami that killed five people after the roughly 3-foot high wave hit the Santa Cruz Islands, an eastern region of the Solomon Islands
- Analyses of zircons from charnockitic gneisses and a ferrodiorite dike in the Adirondack Mountains indicated the rocks were emplaced about 1,150 or 1,160 million years ago. That Adirondack anorthosites were emplaced at ca. 1050 Ma. Each of the four
- And, just in case you want to know what the heck a charnockitic gneiss is, it is a metamorphosed granite, composed mainly of quartz, perthite or antiperthite, and an orthopyroxene such as hypersthene. Did that help?
- A group of researchers in China has discovered that the 130-million-year-old ancestors of some modern birds had feathers on their legs as well as the usual pair of feathered wings seen in modern-day birds. It has been speculated that the plumed legs may have played a major role in the evolution of early birds and flight.
- Sodalite, whose composition is  $\text{Na}_8\text{Al}_6\text{Si}_6\text{O}_{24}\text{Cl}_2$ , is a royal blue mineral used mainly as an ornamental gemstone (lapis lazuli). Although massive sodalite samples are opaque, crystals are usually transparent to translucent. Formed in nepheline syenites, phonolites, and related rock types. In metasomatized calcareous rocks, and in cavities in ejected volcanic blocks.
- If a massive solar storm occurred, the effects on Earth could be devastating because of the loss of power and communications that could last for as long as a few years. Just think about everything you use that requires the use of power, then think about how you would survive without it.
- If you thought the idea of the dinosaurs meeting their end due to a meteorite impact was interesting, now researchers are suggesting that a meteorite that hit off the coast of Chile during the Pliocene-Pleistocene transition could have been responsible for starting the Pleistocene Ice Ages.
- Sinkholes are common, naturally occurring geologic features in Florida, and among the dominant landforms, posing hazards to property and the environment, and just recently, to life.
- Many of Florida's sinkholes develop naturally, but in west-central Florida their increasing frequency corresponds to the accelerated development of land resources and ground-water withdrawals.
- The Martian rover, Curiosity, recently tested its drilling equipment on a rock (named "John Klein") in preparation for the first drilling in history to collect a sample of rock material on Mars.
- When Superstorm Sandy hit the New York and New Jersey coastline in October, wind, waves, and a tidally aided storm surge swept away property, eroded the coastlines, flooded subways, and took down the power grid for weeks.
- Homo habilis, one of the oldest species of the genus that includes you and me, lived from approximately 2.33 to 1.4 million years ago, during the Gelasian.
- Chimney Rocks is an outstanding outcrop of finger-like spires of limestone of the Silurian Tonoloway and Keyser Formations near Hollidaysburg, PA. The spires result from a combination of a small vertical and northeast-trending joints that have become enlarged through dissolution

### PGS Website of the Month

[http://www.paleoportal.org/index.php?globalnav=ti\\_me\\_space&sectionnav=period&period\\_id=15](http://www.paleoportal.org/index.php?globalnav=ti_me_space&sectionnav=period&period_id=15)

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name and Did You Know Columns.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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**PGS Board-of-Directors**

<b>President:</b>	Albert Kollar	<b>Director-at Large:</b>	Tamra Schiappa	<b>Director-at Large:</b>	Bill Adams
<b>Vice President:</b>	Kyle Frederick	<b>Director-at Large:</b>	Robert Botterman	<b>Counselor:</b>	Charles Shultz
<b>Treasurer:</b>	Steve McGuire	<b>Director-at Large:</b>	Ray Follador	<b>Counselor:</b>	John Harper
<b>Secretary:</b>	Judy Neelan	<b>Director-at Large:</b>	Erica Love	<b>Counselor:</b>	Mary Robison
<b>Past President:</b>	Mary Ann Gross	<b>Director-at Large:</b>	Ken LaSota		
<b>Other PGS Positions</b>		<b>AAPG Delegate:</b>	Dan Billman	<b>AAPG Delegate:</b>	Andrea Reynolds
<b>Webmaster:</b>	Mary McGuire	<b>Newsletter Editor:</b>	Robert Botterman	<b>Historian:</b>	Judy Neelan

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412-622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724-938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412-809-6723 (cell) / [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, e-mail John Harper at [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com). Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

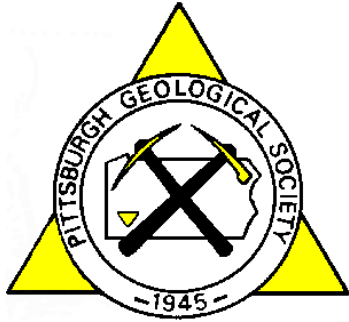
**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724-938-4463 or email [atfredrick@calu.edu](mailto:atfredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 2

Robert Botterman, Editor

October, 2013



Wednesday, October 16, 2013

The Pittsburgh Geological Society presents

## ***THE RESPONSE OF THE GREENLAND ICE SHEET TO GLOBAL WARMING***

**Jason P. Briner Ph.D, Associate Professor of Geology at the University at Buffalo**

This talk provides an up-to-date view on the changes currently taking place on Greenland. Is the Greenland Ice Sheet growing or shrinking? Does it contribute to sea level rise and increase the vulnerability of coastal cities like New York to storms like Hurricane Sandy? What are the outstanding questions about the future of the Greenland Ice Sheet? In addition to providing a current overview of the status of the Greenland Ice Sheet, Dr. Briner will discuss his own research on Greenland, and describe how visits to Greenland since 2008 with his students from the University at Buffalo have led to new insights about the response of the ice sheet to global warming.

### **Biographical sketch**

Jason P. Briner is an Associate Professor of Geology at the University at Buffalo. He holds BS, MS and PhD degrees in Geology from the University of Washington, Utah State University and the University of Colorado-Boulder, respectively. Briner's research focus is on climate and glacier reconstructions from the Arctic, which takes him and his students to Alaska, Arctic Canada, Greenland and Norway. Since arriving in Buffalo in 2005, Briner has mentored two PhD students and ten MS students through graduation on research topics ranging from varve records of arctic climate change to cosmogenic dating of ice sheet response to abrupt climate change to drumlin formation in western New York.

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**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at: [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, October 14.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

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## REMOTE FIELD TRIPS

The PGS Board discussed the possibility of conducting "remote" field trips i.e. field trips that do not leave from Pittsburgh but would convene in a location other than Pittsburgh. The official PGS field trip would begin at that location the following day. The example given was a field trip that would begin in Corning, NY for a trip to the Finger Lakes Region of NY. Attendees would drive themselves to Corning on a Friday afternoon, stay overnight at a local motel, and then enjoy the field trip the following day in transportation supplied by PGS. The major benefit to attendees is that we can expand our geological horizons. If interested, please send an email to [jneelan@verizon.net](mailto:jneelan@verizon.net) with your comments on 1) remote field trips in general and 2) the Finger Lakes field trip specifically.

## ORIGINS OF WESTERN PA PLACE NAMES

In 1787, American Colonial Forces constructed Fort Franklin at the confluence of French Creek and the Allegheny River in Venango County. Named for Benjamin Franklin, the fort was basically all there was at that location until 1795 when a town, also named Franklin, was laid out on about 1,000 acres. In its early years, Franklin was a thriving community that boasted a rolling mill for the manufacture of bar-iron and nails from the output of Venango County's numerous iron furnaces. But it was the 1859 discovery of oil in Titusville, just 20 miles to the northeast, that allowed the town to become an important city of commerce and wealth. The economic boom brought many changes to the face of Franklin, including new commercial and residential structures as a result of all the money rolling in. Many of those who grew rich on Pennsylvania's oil trade made their homes in Franklin, and the city still boasts numerous grand Victorian Era buildings. After the decline of the region's oil industry in the 1880s, Franklin became a base of manufacturing and light industry. Today, it is known mostly as the seat of Venango County, and one of numerous old oil towns of northwestern Pennsylvania with a lot of history to show-and-tell. Think John Wilkes Booth (Lincoln's assassin) and early environmentalist John Chapman (Johnny Appleseed), both of whom were Franklin residents for a time.

## APPALACHIAN MUDROCKS SYMPOSIUM

Appalachian Geological Society and Eastern Section AAPG Eastern Section Presentations on the Marcellus and Utica Mudrocks will cover one of the hottest basins in North America for unconventional resource exploration and production. Talks were selected from 2013 AAPG ACE Meeting in Pittsburgh and the 2013 Unconventional Resources Technology Conference in Denver. Location: West Virginia University – Erickson Alumni Center, Morgantown, West Virginia.

## Sunday Evening Reception

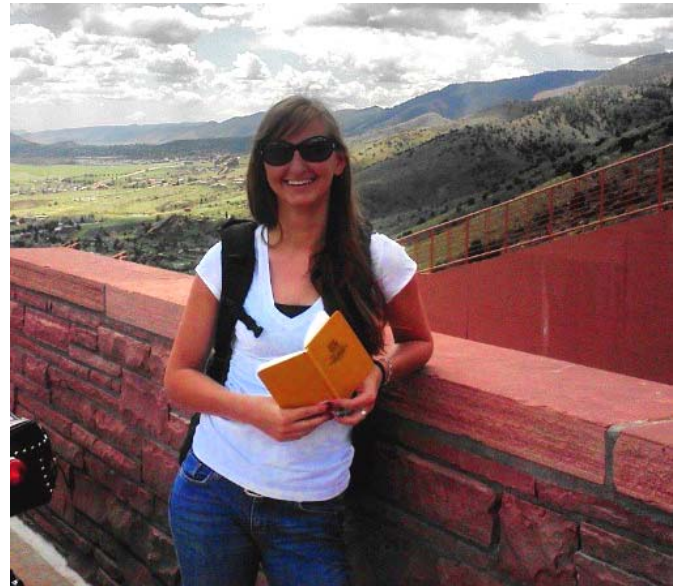
Don't miss the chance to visit with old friends and network with new players in the center of one of the hottest regional plays in North America. Enjoy drinks, hors d'oeuvres and camaraderie from 5:00 to 7:00 at the Erickson Center.

Additional information and registration online at:

[www.geo.wvu.edu/~tcarr/AGS\\_ESAAPG/index.html](http://www.geo.wvu.edu/~tcarr/AGS_ESAAPG/index.html)

## PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting one of our student members each month. Our first student volunteer is Courtney Killian. Look for the same treatment for additional student members in the coming months.



- 1. Name, email:**  
[Courtney Killian, ck695@msstate.edu](mailto:ck695@msstate.edu)
- 2. Education (school, degree, expected graduation date):**  
[Mississippi State University, M.S. Geology, May 2015](#)
- 3. Internships or previous company history:**  
[PA Department of Environmental Protection](#)  
*Engineering, Scientific, and Technical Intern*
  - [Mine Subsidence Insurance \(May – August 2012\)](#)
  - [Bureau of Abandoned Mine Reclamation \(June – August 2013\)](#)
- 4. How long have you been a member of PGS?**  
[Since fall 2010?](#)
- 5. Any ideas on student related activities that you wish PGS would do?**  
[Continue the drilling workshop!](#)  
[Tour of an underground coal mine](#)



6. Are you working on any research topics, please list title, describe?

Tombigbee water quality project

Currently, I am working on water quality monitoring for the Tombigbee Forest in northeast Mississippi. This includes the use of a multi-parameter probe (In-Situ brand), similar to the YSI brand I used in my undergraduate. We record the water temperature, turbidity, pH, dissolved oxygen, and conductivity. We also monitor the flow of several streams and springs. There are about 35 sites monitored in all. Future projects to come!

7. What's your favorite subject/area of study?

Do I have to pick? Hydrology

8. What are your plans following graduation? (Continuing with your education, academia, or into the job market)?

Currently, I would like to get a job after graduation, but I am keeping the idea of obtaining a Ph.D in mind.

9. What are your plans if money was not a issue?

See number 3.

10. What is your dream geology job?

My dream geology job would be to own my own environmental consulting firm in Colorado.

11. What is your favorite PA geology site/fun fact/phenomenon, etc.?

My favorite geology site is anywhere along interstate 80, 376, or 76 heading east through the mountains. The road cuts are amazing.

12. What is the most exciting place you have been geologically or one play you wish you could visit?

The most exciting place I have been geologically would have to be the area in and around Moab, Utah. Arches National Park is a must-see, and I hope to go rock climbing in the area one day.

13. What is your favorite or least favorite "Bad" geology movie and why?

2012, the one where the guy is able to outrun the pyroclastic flow and Los Angeles falls into the ocean.

14. What's your favorite rock, mineral, or fossil?

I do not have a favorite. I love them all for different reasons, especially if they sparkle or are red.

15. What's the #1 most played song on your iPod?

Who knows?

16. What is one of your favorite quotes (geology related or not)?

Be happy.

17. Anything else you would like to share about yourself?

I love what I do.



### PGS PROFESSIONAL MEMBER FEATURE

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is John Harper. Look for the same treatment for additional members in the coming months.

1. **Name/certifications:** John A. Harper, PG
2. **Company, title or role, years with company:** Pennsylvania Geological Survey, Retired after 35 years.
3. **How long have you been a member or PGS?** Since 1978.
4. **Have you held any officer positions (can you remember when)?** Treasurer, 1991-1993, President, 1993-94.
5. **Education:** BA, 1968, Geography/Earth Sciences, Indiana University of Pennsylvania,

MS, 1972, Geology, University of Florida  
PhD, 1977, Paleontology and Paleocology,  
University of Pittsburgh



6. **What are some of your day to day responsibilities in your current role?**  
Sleeping in, babysitting my grandson, being a royal pain in the butt (hey – I'm retired. I'm ALLOWED to be a royal pain in the butt!).
7. **What is the best and worst thing about your current job?**  
Best? I'm retired – what could be bad? Actually, I volunteer two days a week in the Invertebrate Paleontology Section of the Carnegie Museum where I get to play with fossil snails. There are no drawbacks to that "job".
8. **What was your first geology job out of college or weirdest geology job and learn anything you would like to pass on?**  
I worked as an intern with the Pennsylvania Geological Survey the summers of 1973 and 1974 while working toward my PhD. My first REAL job was also my only job, with the Pennsylvania Geological Survey in their Pittsburgh office, keeping track of oil and gas wells, getting involved in geohazard investigations, educating people on fossils and fossil collecting, and other sundry duties. I started out as a "grunt" geologist, fell into a supervisory position when all the senior geologists left for industry or academe, then got kicked upstairs to manager a few years before I retired. Considering all the grief I gave to my superiors over the years, you'd think I would have ended my 35 years as a "grunt". So, I honestly don't have anything constructive to pass on.
9. **What is your dream geology job?**  
From the first moment I realized I wanted to be

a paleontologist (~9 years old), I dreamed of studying dinosaur bones in the dark, dusty backroom of a museum. Over the years, the dream changed from dinosaurs to Paleozoic snails, but other than that, it didn't change. Now that I'm retired and spending time at a back table in the Invertebrate Paleontology Section of the Carnegie Museum cataloguing and rediscovering Paleozoic snails, my dream has reached reality!

10. **What is your favorite PA geology site/fun fact/phenomenon, etc.?**  
All of western Pennsylvania. When I was in undergraduate school, my professors told me to go west because everything was already known about the Appalachians. I am happy to report that there are still many things geological to discover even within the local Pittsburgh area.
11. **What is one thing you wish someone would have told you when you were starting out in the geology profession?**  
Take more biology courses.
12. **What is one class you wish you would have taken in college? (doesn't have to be a geology class)**  
A decent invertebrate zoology course. The one I had sucked!
13. **What is the most exciting place you have been geologically?**  
A toss-up between the Grand Canyon and Yellowstone. The Grand Tetons and Alaska are close seconds.
14. **What is your favorite or least favorite "Bad" geology movie and why?**  
Favorite is "Dante's Peak". Despite the silliness of watching people drive across a moving lava flow in a pickup truck, I think it did a good job portraying geologists in their element.  
Probably the worst bad geology movie is all the rest, especially "The Core", "Volcano", and "Armageddon".
15. **What's your favorite rock, mineral, or fossil?**  
Rock – Organic-rich, calcareous shale. My first fossil collecting stratum.  
Mineral – Malachite. I love the green and black swirls. I once saw a human-sized vase carved out of a single specimen.  
Fossil – All of them, but if I have to choose one, probably *Echphora quadricostata*, a Mio-

Pliocene snail that no other snail resembles.

**16. What's the #1 most played song on your iPod?**

I don't have an iPod and hope to never have one. I DO have an MP3 player, but I prefer CDs. The #1 most played song will depend on what year. Could be Beethoven's Seventh Symphony, "Come All You Fair and Tender Ladies" by The Rankins, anything by the Irish/American band Solas, or any of a number of other classical, rock, folk, or Christmas songs.

**17. What is one of your favorite quotes?**

"Any difficult situation can be made impossible if enough meetings are held to discuss it."

**18. If you could choose anyone, who would you pick as your mentor?**

I had two of the best, Walter R. "Dick" Wagner when I worked at the Survey as an intern in 1973-74 and Bud Rollins, my advisor at Pitt.

**19. If you could meet any geologist, living or dead, who would you meet?**

I would love to have met Fielding Bradford Meek, paleontologist extraordinaire from the mid-1800s, and John Franklin Carll, geologist in charge of the oil fields for the Second Geological Survey of Pennsylvania (1874-1899). I would also consider Edward Miller, who worked for the Allegheny Portage Railroad, but he was an engineer, not a geologist.

**20. Anything else you would like to share about yourself?**

I am NOT an overachiever, despite what people say.

**DID YOU KNOW . . . ?**

- Ammonites from the Upper Cretaceous Pierre Shale of South Dakota often incorporated isotopically light carbon derived from nearby methane seeps in their shells, probably because the seep's methane-oxidizing bacteria provided basic sustenance for a variety of animals within the ammonites' food chain.
- Tectonics can trigger large eruptions by rupturing shallow-crustal magma chambers and the transport of magma laterally, especially in extensional regimes, without leaving any noticeable geological signs.

- Modern space geodesy has enabled us to observe directly some of the slow geological processes that move and shape Earth's surface, such as plate tectonics and crustal strain accumulations that can create earthquakes.
- Ratios of magnesium to calcium, lithium to calcium, and uranium to calcium found in the shells of benthic Foraminifera from the Ocean Drilling Program across the Oligocene-Miocene boundary demonstrate that Atlantic bottom-water temperatures varied cyclically through that time interval, with the main cooling steps followed by ice grown and the main warming steps followed by ice decay.
- There has been a lot of interest in using the Earth's lithosphere for the isolation of nuclear waste. This has, in turn, resulted in interest in the origin, age, and movement of fluids and gases in low-permeability rock formations.
- The Late Triassic mass extinction event was the most severe global warming-related crisis to have affected important extant marine groups such as modern corals. As such, it could offer insight into potential modern climate-change scenarios.
- As much as 15% of the Earth's coastline at temperate and tropical latitudes is in regions where desert and steppe precipitation occur.
- Researchers have speculated, based on ice sheet models, that once it was formed, the large, high-altitude East Antarctic Ice Sheet was relatively self-stabilizing as a result of its cold upper surface.
- The largest mass-wasting deposit so far discovered, with an average thickness of 30 to 65 feet on the upper slope and 295 to 655 feet on the lower slopes, occurs in the deep-water Gulf of Mexico. It has been found in 31 wells and in seismic surveys, and has been linked to the supposed end-Cretaceous Chicxulub impact.
- This large deposit, occurring on an unconformity representing between 9 and 85 million years of erosion/nondeposition, provides further evidence that the Chicxulub impact was a single impact event. Whether it occurred at the Cretaceous/Tertiary boundary or not is still questionable.
- The total thickness of an active plate boundary fault encompassing all simultaneously active strands increases to about 300–1,150 feet at about 0.6 to 1.2 miles below the seafloor and is maintained to a depth of approximately 9 miles.

- Volcanism at the western margin of the Pacific Ocean developed above subducting ocean crust, generating island arcs and spreading basins.
- It is a widely known that climatic conditions during the Late Pleistocene or early Holocene resulted in the failure of slopes, especially in western Pennsylvania, particularly in the Pittsburgh red beds. They typically occur as large breaks in slope on the steeper hillsides that are especially prominent during leaf-off conditions.
- The boundary thrust zone of the Central Metasedimentary Belt (Grenville Province of Canada) is a northeast-southwest-trending thrust zone consisting of metaplutonic thrust sheets enveloped in gneissic tectonites and calcitic-dolomitic marble. Try saying THAT three times quickly.
- High-frequency magnetic anomalies in the Appalachian deformed domain (ADD) of Alabama correspond to amphibolites and mylonites outlining terranes, while broader, lower-amplitude domains include Paleozoic intrusive bodies and Grenville basement gneiss.
- Eruption and caldera collapse in the western Nevada volcanic field occurred between at least 34.4 and 23.3 Ma and clustered into five ~0.5–2.7-Ma-long episodes separated by quiescent periods of ~1.4 Ma.
- There are many miles of mountainous roads with rock slopes prone to rockfall; the highway engineering geologist must analyze the complex instabilities inherent in such areas as a multidimensional process that requires engineering judgments regarding the choice of a suitable protection device because different alternatives can be used to solve the same problem, taking into account the costs and impact on the environment.
- If you think mountains just pop up during a single period of orogeny, you're wrong. The Sierra Nevada of California and Nevada, for example, have a complex history of growth that exhibits both ancient (40–60 Ma) and relatively young (<3 Ma) elevations.

## **EASTERN SECTION AAPG STUDENT EXPO**

Appalachian Geological Society and Eastern Section AAPG.

Location: West Virginia University – Erickson Alumni Center, Morgantown, West Virginia

The Eastern Section AAPG will be holding a Student Expo on November 2-3, 2013. The Expo links geoscience students with industry recruiters. Students can network, present and discuss their research and interview with multiple potential employers. Information on poster presentations and presentation travel grants is available online.

Activities at the two-day Student Expo include:

- Student Chapter Leadership Conference (Saturday, November 2 – 1:00 to 5:00 pm)
- Saturday Evening reception and poster sessions on geology and geophysics (Saturday, November 2 – 5:30-7:00 pm)
- Field-trip to visit Marcellus shale gas operations
- Company sponsored Luncheon with poster awards (Sunday, November 3)
- A potentially full day of poster presentations and interviews (Sunday, November 3)
- Free attendance at the AGS-ESAAPG Mudrocks Symposium (Monday, November 4)

Additional information and registration online at:

[http://www.geo.wvu.edu/~tcarr/AGS\\_ESAAPG/index.html](http://www.geo.wvu.edu/~tcarr/AGS_ESAAPG/index.html)

### **PGS Website of the Month**

<http://www.sgs.org.sa/English/Pages/default.aspx>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name and Did You Know Columns.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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**PGS Board-of-Directors**

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412.622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724 938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412 809-6723 (cell), or [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 442-4230, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).

Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

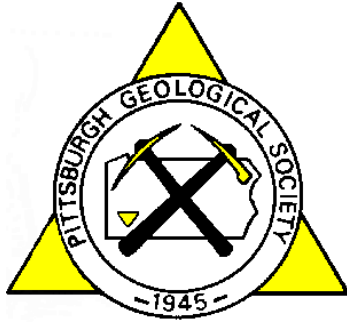
**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 3

Robert Botterman, Editor

November, 2013



Wednesday, November 20, 2013

The Pittsburgh Geological Society presents

## ***OBJECTIVES AND TRADE-OFFS FOR US ENERGY***

**Paul Meier, PE, Ph.D. Scientist, Wisconsin Energy Institute**

There are common-sense objectives for U.S. energy that most Americans would agree on. In addition to having adequate supply for our immediate demands, we want our energy to be affordable, domestic, clean, and long-lasting. So how are we doing in these regards? Paul will consider these objectives using recent statistics and share insights from his research on alternative energy systems. He will further discuss his efforts to move the environmental debate beyond rhetoric and towards data-driven analysis of objectives and trade-offs.



### **Biographical sketch**

Paul Meier is a scientist with the Wisconsin Energy Institute at UW-Madison, serving as director from 2006 to 2012. Paul has worked with industry, government and public interest groups on energy and environmental issues since 1995. His efforts have focused extensively on the use of energy systems modeling to support decision-making. Paul has led research efforts to evaluate energy alternatives at the national, regional, and state levels and spanning electricity, transportation, and building energy sectors. Paul is an environmental engineer with degrees from Purdue University and Clemson University and earned his Ph.D. from the Nelson Institute for Environmental Studies at UW - Madison.

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**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at; [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, November 18.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

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## CONSULTANTS LIST UPDATE

PGS is updating the Consultants Listings on the website. Please review your companies entry in the Consultants list on the website ([www.pittsburghgeologicalsociety.org/consultant2013.doc](http://www.pittsburghgeologicalsociety.org/consultant2013.doc)). Any new entries or updates to existing entries should be sent to [Ericailove@hotmail.com](mailto:Ericailove@hotmail.com).

Please be sure to include the primary county your office is located in and your Areas of Expertise codes (G-General, EG-Engineering and Geotechnical, HW-Hydrogeology and Water, E-Environmental, OG-Oil and Gas, C-Coal, MR-Mineral Resources, DS-Database Services

Entries should be in the following format

Company Name – Service Area/Office if more than one location - Area of Expertise Codes (all that apply)

County:

Address:

Telephone:

Fax:

Email:

Web address:

Contact Person:

1 - 2 sentence description of capabilities.

## ORIGINS OF WESTERN PA PLACE NAMES

Nanty Glo, a small borough in Cambria County between US routes 22 and 422, and 7 miles west of Ebensburg, originated in the 1890s when it was called Glenglade. It was then a lumber camp on the southern branch of Blacklick Creek. Coal was discovered in the area around this time and commercial mining began in 1896. By 1899, the huge deposits of Lower Kittanning coal (Allegheny Formation, Middle Pennsylvanian) in the settlement were well known, attracting many other settlers and even the Pennsylvania Railroad, which constructed a spur line through the community. Supposedly, the town's name changed to Nanty Glo on February 20, 1901, but whether the inhabitants named it after a small town in Wales about 30 miles north of Cardiff, or just thought the Welsh phrase sounded nice and actually suited the community, is not known.

Nanty Glo (*nant y glo*) is Welsh for “the coal stream.”

## PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting one of our student members each month. Our student member volunteer is Kelsey Rufft. Look for the same treatment for additional members in the coming months.



- 1. Name, email:**  
[Kelsey Rufft, Rufftgeo@gmail.com](mailto:Kelsey.Rufft@gmail.com)
- 2. Education (school, degree, expected graduation date):**  
[California University of Pennsylvania, Geology and Secondary Education in Earth Science, and December 2013](#)
- 3. Internships or previous company history:**  
[THG Geophysics- Field Technician Summer 2013](#)  
[Kentucky Geological Survey- Coal Division Summer 2012](#)
- 4. How long have you been a member or PGS?**  
[I believe this will be my fifth year attending.](#)
- 5. Any ideas on student related activities that you wish PGS would do?**  
[I would love to attend a field trip or partner with another university group to go hiking or outdoor adventuring.](#)
- 6. What's your favorite subject/area of study?**  
[Plate Tectonics is my favorite subject area. I love the broader picture and the incorporation of multiple concepts into a larger theory.](#)

**7. What are your plans following graduation? (Continuing with your education, academia, or into the job market)?**

I am eager to enter the job market. I am looking for a job exiting school where I can get hands on experience and learn as much as possible in a short time period. If possible I would return to graduate school when appropriate.

**8. What are your plans if money was not a issue?**

Travel. Travel. And Travel. I want to see the world. I love learning when you are outside of the classroom.

**9. What is your dream geology job?**

I want a job that I can continuously learn and see new things. I like to be challenged and working outside the norm. I would like the opportunity to travel. I want a job that makes a difference in peoples' lives. If I could wrap that all into one, I believe that would be my dream job.

**10. What is the most exciting place you have been geologically or one place you wish you could visit?**

I want to visit the Andes and see an active volcano plus eruption! I would like to visit Alaska and go by boat to see glaciers. I would like to visit the Himalayan Mountains and go backpacking.

**PGS PROFESSIONAL MEMBER FEATURE**

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is Ken LaSota. Look for the same treatment for additional members in the coming months.

**1. Name/certifications:**

Kenneth A. LaSota, Ph.D.

**2. Company, title or role, years with company:**

Robert Morris University. Associate Professor of Geology and Earth Sciences. 26 years

**3. How long have you been a member or PGS?**

Five years

**4. Have you held any officer positions (can you remember when)?**

Currently serving my first term as an at-large member of the Board of Directors

**5. Education:**

2003 M.S. Instructional Leadership; Robert Morris University

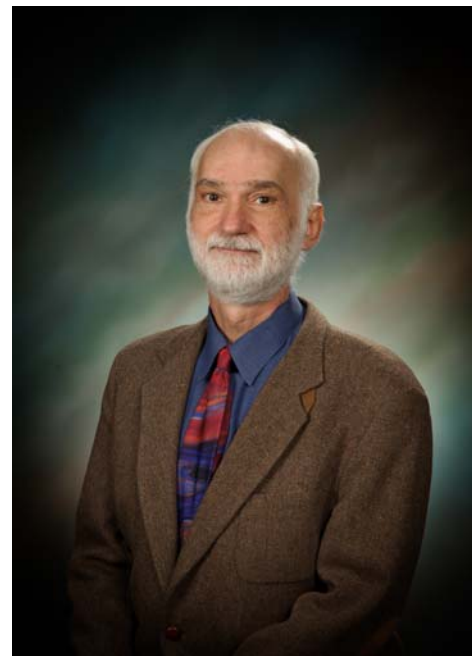
1999 M.S. Secondary Education; Robert Morris University

1992 M.B.A. Management; Robert Morris University

1988 Ph.D. Geology; University of Pittsburgh

1982 M.S. Earth Science; Iowa State University

1977 B.S. Meteorology; Pennsylvania State University



**6. What are some of your day to day responsibilities in your current role?**

I teach undergraduate courses in physical geology, hydrogeology, meteorology, and air pollution to support RMU's BS degree in environmental science. I also teach general survey courses for non-science majors, such as astronomy. I serve as a faculty advisor to a chapter of the Alpha Chi National Honors Society on campus, direct a senior thesis from time to time, serve on a number of departmental and campus wide committees,



and sit in my office waiting for students to stop by.

**7. What is the best and worst thing about your current job?**

I do like to teach. Teaching is the opportunity to tell stories to a captive audience and I do like telling stories. I can honestly say that I enjoy all elements of my work at RMU. I can not believe how fortunate I am to do what I love doing.

**8. What was your first geology job out of college or weirdest geology job and learn anything you would like to pass on?**

Just as with many great geologists, such as Alfred Wegener, I started life as a meteorologist and turned to geology after an epiphany of sorts. With my degree in meteorology in hand from Penn State and hoping to land a position with an air pollution related environmental firm, the demise of the steel industry in western Pennsylvania put me in a pickle. Fortunately, the handful of geology courses that went with my degree allowed me to work as a geophysical technician in Casper, Wyoming for Century Geophysical Corporation, producing electric logs of wells drilled in support of a uranium mining operation. I would log five to ten shallow holes a day, 200 to 500 foot depths, six days a week. Miles from the nearest road, sitting alone in an instrumented truck watching tornados touch down yards from my location, this is when I knew it was time to consider graduate school. The rest is, as they say, history.

**9. What is your dream geology job?**

As an academic, I have never really worked in the real world, where a boss expects results and expects them now. As I tell my students, I have been in college since 1973 and have a dream job. As such, the only other dream job I could think of would be as a curator of antiquities at a museum, a place where I envision not much is expected, at least not in a timely fashion, as many if not most of the museum's collections would be centuries if not

millenniums old. Hence, not much would change, but being around such old and interesting things would offer a real tangible appeal. My apologies to Albert as he knows that this dream is not based in any form of reality.

**10. What is your favorite PA geology site/fun fact/phenomenon, etc.?**

My wife Rebecca and I really liked our time in Cook Forest and in the Grand Canyon of Pennsylvania. Nothing like walking in and among old growth trees and viewing spectacular vistas.

**11. What is one thing you wish someone would have told you when you were starting out in the geology profession?**

It would have been nice to know that college faculty are not paid well. Fortunately, college types have a very flexible schedule, with lots of time to do interesting things, such as watch TV with the wife, go to movies, and describe the wonders of the Earth to young and sometimes eager listeners.

**12. What is one class you wish you would have taken in college? (doesn't have to be a geology class).**

I cannot speak any foreign language, nor can I play a musical instrument. Therefore, I am, as a life form who only gets but a few trips around the sun, far from complete. If I could have learned either, or preferably both, of these avocations, I would be a happier camper.

**13. What is the most exciting place you have been geologically?**

My wife and I enjoyed Yellowstone. Bizarre landscapes, lots of big animals that are not native to where we live, Heidelberg, a rustic old lodge with lots of good food and drink. Yellowstone had everything.

**14. What is your favorite or least favorite "Bad" geology movie and why?**

There is no such thing as a bad movie, geologically speaking or otherwise. Except perhaps "Jackass". Rebecca and I go to all the

movies we can and watch even more at home. We really enjoy any movie that is black and white. Moreover, I really enjoy black and white science fiction movies, those with the spacecraft suspended visibly from a string as it flies. Nothing can beat that.

**What's your favorite rock, mineral, or fossil?**

I collected a good sized slab of a pebble conglomerate of the Pottsville Sandstone near Johnstown, PA that has a ripple marked surface. It now sits in my garden. That a conglomerate could have ripples on a bedding surface, with quarter inch quartz pebbles visibly deformed and conforming to the rippled surface, truly amazes me.

**15. What's the #1 most played song on your iPod?**

I don't even know what an iPod is.

**16. What is one of your favorite quotes?**

"The result, therefore, of our present enquiry is, that we find no vestige of a beginning,—no prospect of an end". James Hutton, 1788. Theory of the Earth; or an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe. Transactions of the Royal Society of Edinburgh, vol. I, Part II, pp. 209–304

**17. If you could choose anyone, who would you pick as your mentor?**

Fortunately, I chose a wonderful mentor several years back: A one time social worker turned teacher, turned nurse. A published author. A kind and gentle lady. A warm and sweet person who has guided me and mentored to a happy and satisfying life. The only mentor that I have ever needed, my lovely wife and best friend Rebecca Stanhope, RN, Ed.D.

**18. If you could meet any geologist, living or dead, who would you meet?**

I would really enjoy spending time with the Scottish gentleman farmer, James Hutton, father of the discipline modern geology. He was the first to figure out in his head that the ground we stand on is worthy of an intellectual

investigation, well suited for the rigors of lively scientific debate, and freely giving of enjoying its natural beauty.

**19. Anything else you would like to share about yourself?**

I have been elected to serve four terms as Mayor of the Borough of Heidelberg, PA and have enjoyed all of the sixteen years. Helping Heidelbergundians to make our town a better place to live has been a delight. I'm up for re-election in November and I can get anyone who wants an absentee ballot, already filled out with the name of the only geologist running.

**DID YOU KNOW . . . ?**

- The early Eocene Epoch (50M years ago) was about as warm as the Earth has been over the past 65M years, since the extinction of the dinosaurs. During this epoch, there were crocodiles above the Arctic Circle and palm trees in Alaska.
- You can't see it from the air or the ground (sea level) but the oolitic sediments in the Bahamas actually lie on a gently dipping, irregular rocky surface (the Pleistocene/Holocene boundary) with little or no topographic expression, suggesting that ooid shoals don't need an underlying topographic high in order to form.
- Although most data suggest that modern humans migrated from Africa to Arabia around 60K years ago, new evidence from the United Arab Emirates suggests that our ancestor were actually in eastern Arabia during the last interglacial (125K-75K ma).
- Many sand ripples and dunes occur on Mars, suggesting movement of as much as a few meters per year under current conditions in diverse areas of the planet. Most of this motion is probably driven by wind gusts that don't show up in global circulation models.
- Dynamic reservoir performance in turbidite channels is governed by such parameters as channel width, net-to-gross and degree of amalgamation, and parameters that describe the distribution of shale drapes along the bases of the channels.

- Negative  $\delta^{13}\text{C}$  excursions, glauconite, and pyrite-rich horizons in the Permian-Triassic transition zone of northwestern Gondwanaland (present-day Israel) indicate hypoxic or anoxic conditions and suggest disturbances in the global carbon system in the oceans.
- Although the magnitude-7.0 earthquake that hit Haiti in 2010 was catastrophic, killing more than 200K people and leaving more than 1.5M homeless, it barely ruptured the surface of the island.
- An extinction event occurred in the latest Paleocene benthic foraminiferal communities when anoxia, probably resulting from enhanced organic carbon fluxes to the sea floor, triggered a marked repopulation event that lasted about 100K to 200K years.
- The Rhone Glacier, which forms the headwaters of the Rhone River, has been shrinking for the last 150 years in response to climatic shifts, revealing remnants of forests and human settlements dating back thousands of years before the industrial age when even more of the land was uncovered and green.
- A Japanese geologist has discovered the oldest known bits of space dust to have fallen on the Earth so far; the microscopic iron rich spheroids have been estimated at 240M years old, about 50M years older than any other space dust ever found on Earth.
- Scientists have discovered evidence that microscopic fossil organisms began secreting mineralized shells as far back in geologic time as 717M to 812M years ago.
- One of the great American myths has pre-Columbian Native Americans as the continent's first environmentalists, existing in total harmony with nature, depending on renewable resources, and not altering the landscape. Actually, Native Americans living in the Delaware Valley dramatically altered the terrain by clearing forests for farmlands, thereby increasing the number of floods.
- Another American myth is that the eastern part of North America, particularly the mid-Atlantic states and the Northeast, were

completely forested. That is also likely not true as the Native Americans had to clear the forest to make way for their crops, and corn was grown almost everywhere along the East Coast.

- A team of paleontologists has discovered the oldest skeletonized animal, called *Coronacollina acula*; this organism lived between 560M and 550M years ago, placing it in the Ediacaran Period before the explosion of life and diversification of organisms took place in the early Cambrian.
- Scientists using high-resolution magnetic data collected across the Tendaho Graben in the Afar Depression of Ethiopia documented one of the first examples of terrestrial magnetic lineations, similar in pattern and amplitude to those that characterize seafloor spreading centers.
- In order to understand Earth's total carbon budget, you need to account for ALL natural sources of  $\text{CO}_2$  (not just the man-made ones). Scientists from the Institute of Technology and Renewable Energy in Spain recently found that volcanic lakes emit somewhere around 117 million tons of  $\text{CO}_2$  annually.

### PGS Website of the Month

<http://deepseachallenge.comthe-science/geology/>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name and Did You Know Columns.*

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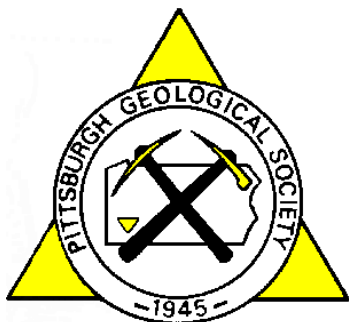
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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 4

Robert Botterman, Editor

December, 2013



Wednesday, December 18, 2013

The Pittsburgh Geological Society presents

## *From California to California: A Journey of Geodiscovery*

**Kyle C. Fredrick, PhD, Associate Professor, Department of Earth Sciences, California University of Pennsylvania**

Each year, students of Geology venture from CalU and the familiarity of southwestern PA to parts of the US to which many of them have never been, nor even imagined. It is these educational opportunities that, in a way no other class or school experience can, crystallizes the geological curriculum and instills a curiosity and appreciation for the Earth in our students. It is the most identifiable reason behind the rebirth and growth of the Geology program at CalU over the past several years.

Geology programs throughout the US recognize the importance of field experiences in all forms for undergraduate geology students. However, economic pressures over the past several years have forced many schools to rethink their curriculum, removing or scaling back field trips that had been a staple of their programs. At CalU, however, thanks to administrative support and faculty persistence, we were able to initiate a continuing program whereby each summer students complete a "regional field experience." Formatted as a 3-credit course, these trips take students to various regions of the country, visiting sites of geological interest. Students share new experiences of scenery, climate conditions, geology, and even social situations. For juniors and seniors, the course has proven to be the quintessential capstone for most of the participants. For younger students, it is a launch pad toward a more engaged relationship with the subject matter in subsequent courses.

In Summer 2013, we endeavored on a new adventure across the US, driving from California, PA to the state of California. Covering over 5000 miles, students were exposed to a variety of geologic settings, from the first stop near Santa Fe, NM to the last night in Ouray, CO, and grew as scientists and friends. The highlights of the trip included the Grand Canyon and Yosemite. But for the students, those were just parts of the continuous journey exposing them to red rock canyons, cinder cone and caldera-style volcanoes, basin and range topography, and alpine glacial terrains.

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**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at: [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, December 16.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

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### Biographical Sketch

Dr. Kyle C. Fredrick is an Associate Professor of Geology in the Department of Earth Sciences at California University of Pennsylvania (CalU). He joined the faculty in Fall 2007 and has directed the Geology Program since that time.

Kyle received his B.S. in Geology from the University of Wisconsin – River Falls in May 2000. He moved on to the University at Buffalo (UB), in Buffalo, NY, where he received his PhD in Geology in June 2008. His doctoral work focused on groundwater modeling and surface/ground water interactions.

After his undergraduate degree, he attended the geological field camp of UB, mapping in Colorado, Utah, and Wyoming. Kyle began his teaching career as a teaching assistant for the UB field camp in 2001 and 2002, following up as a field camp instructor in 2004, 2005, and 2007. His first full-time teaching was at Buffalo State University from Spring of 2005 through Spring 2006. In Fall 2006 he began a one-year position at Hobart and William Smith Colleges in Geneva, NY as a Visiting Instructor. After completing his first year as a tenure-track professor at CalU, Kyle led his first regional field trip to the Colorado Plateau. He has followed that up with trips each summer to regions including the Yellowstone area, New England, and eastern California.

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## CONSULTANTS LIST UPDATE

PGS is updating the Consultants Listings on the website. Please review your company's entry in the Consultants list on the PGS website ([www.pittsburghgeologicalsociety.org/consultant2013.doc](http://www.pittsburghgeologicalsociety.org/consultant2013.doc)). Any new entries or updates to existing entries should be sent to [Ericailove@hotmail.com](mailto:Ericailove@hotmail.com).

Please be sure to include the primary county your office is located in and your Areas of Expertise codes (G-General, EG-Engineering and Geotechnical, HW-Hydrogeology and Water, E-Environmental, OG-Oil and Gas, C-Coal, MR-Mineral Resources, DS-Database Services

Entries should be in the following format

Company Name – Service Area/Office if more than one location - Area of Expertise Codes (all that apply)

County:

Address:

Telephone:

Fax:

Email:

Web address:

Contact Person:

1 - 2 sentence description of capabilities.

## STUDENT FIELD WORKSHOP

PGS will be sponsoring the Student Field Workshop this coming Spring 2014 (Saturday at the end of March or beginning of April). The Workshop will take place at California University of Pennsylvania.

The Workshop will include:

- Soil & Rock drilling demonstration
- Sample collection
- Basic groundwater sampling procedures
- Basic soil/rock descriptions
- An informal rock coring demonstration on the Friday before the actual Workshop.

We have been listening to comments and suggestions from past students and will be including more “real world” scenarios.

We are limiting the number of attendees to 30 (no more than 8 per college/university) – so watch the PGS Newsletter for registration information.

If you have any pre-registration questions or comments, please contact Frank Benacquista ([fbenacquista@kuresources.com](mailto:fbenacquista@kuresources.com)).

## ORIGINS OF WESTERN PA PLACE NAMES

Morgan John Rhys (1760–1804) was a radical evangelical Welsh Baptist minister who preached against slavery and for parliamentary reform. In 1794, weary of British repression, he immigrated to America and established a Welsh colony in western Pennsylvania called Cambria. Two years later, a Congregational Minister named Rees Lloyd (1759-1838) led 20 Welsh expatriates from Philadelphia to Cambria and settled near the top of Allegheny Mountain. He named his community Ebensburg after his son Ebenezer who died at age 8 months shortly after the Lloyds arrived in America. The minister, who owned the land, donated it to the government in exchange for Ebensburg becoming the county seat of Cambria County. Besides a regional office of the PA DEP, Ebensburg is home to the Cambria CoGen Company, which operates an 85-megawatt coal refuse-fired cogeneration facility just south of US 22. Cambria CoGen exports approximately 88 megawatts of electricity to Pennsylvania Electric Company and low-pressure steam to a local nursing home. It burns about 650,000 tons of bituminous coal refuse every year from coal refuse piles in Cambria and Indiana counties.

## PITT GEOLOGY CLUB SWEATSHIRTS



Pitt Geology Club is placing an order for University of Pittsburgh Geology Department sweatshirts on January 31, 2014 to raise funds for a trip to Vermont/New Hampshire this upcoming summer. Sweatshirts are blue and gold (only) and available for \$35.00 for sizes S to XL, \$36.00 for XXL, and \$36.50 for sizes XXXL (mens). Orders will be accepted at the January PGS meeting and payment is due when orders are placed. Cash or check made out to "Underground Printing" are acceptable. Sweatshirts will be delivered at the PGS meeting in February. If you can't make the January meeting, please send your name, size, and a check, to Pitt GeoClub C/O the University of Pittsburgh Geology Dept., 4107 O'Hara St. Pittsburgh, Pa 15213. Checks must be received by 1/31/2014.

## PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting one of our student members each month. Our student member volunteer is Maria Spadaro. Look for the same treatment for additional members in the coming months.



- 1. Name, email:**  
Maria Spadaro, [mspadaro1990@gmail.com](mailto:mspadaro1990@gmail.com)
- 2. Education (school, degree, expected graduation date):**  
[University of Pittsburgh, Bachelor of Science in Geology, I graduated in the summer of 2012](#)
- 3. Internships or previous company history:**  
[Currently employed at Geotechnical Testing Services](#)
- 4. How long have you been a member or PGS?**  
[One year.](#)
- 5. Any ideas on student related activities that you wish PGS would do?**  
[Maybe some sort of workshop on how to find jobs in the Geosciences after graduation.](#)
- 6. What's your favorite subject/area of study?**  
[I always loved structural geology, to me, that class was very exciting and it really aided my field camp experience.](#)

**7. What are your plans if money was not an issue?**

I would probably look at going back to school to get a Master's degree or do some traveling to geologically interesting sites.

**8. What is your dream geology job?**

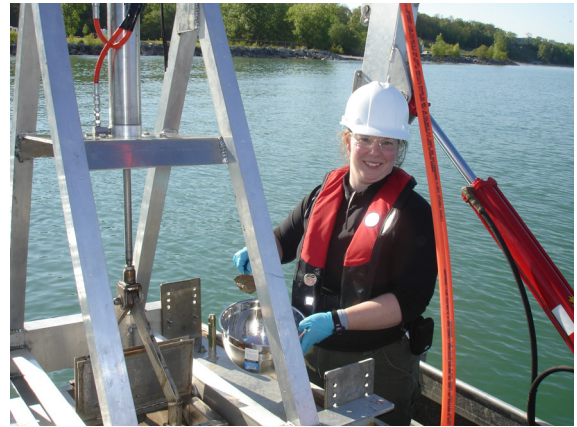
I would really want to be a field geologist. I like the "hands on" work and being able to see what is going on so I can put what I have learned to practical applications.

**9. What is the most exciting place you have been geologically or one place you wish you could visit?**

The most exciting place I have been was Southwestern Montana. I was there for my field camp and it was so exciting and new to see a different area's geology.

**10. What is your favorite or least favorite "Bad" geology movie and why?**

Jurassic Park. The movie came out when I was very young and it got me interested in dinosaurs/geology (sort of my first exposure to it).



**PGS PROFESSIONAL MEMBER FEATURE**

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is Erica Love. Look for the same treatment for additional members in the coming months.

**1. Name/certifications:**

Erica Love, PG

**2. Company, title or role, years with company:**

Tetra Tech Inc., Project Manager, 4 years

**3. How long have you been a member or PGS?**

Since about 1998, started as a student member.

**4. Have you held any officer positions (can you remember when)?**

Secretary – 2009-2010

**5. Education:**

B.S. Environmental Geology, University of Pittsburgh, 2000

M.S. Geology, University of Pittsburgh, 2003

**6. What are some of your day to day responsibilities in your current role?**

Currently my job is more management than geology but day to day I manage projects involved in groundwater, stream, sediment sampling, well installation and abandonment, write reports on well installation and abandonment and various investigations into the distribution and extent of contamination. I also work with government clients to remove munitions from former bombing targets, pistol/rifle/grenade ranges, and conduct investigations to determine if munitions remain on site, to determine how many if any remain on site, associated risks, and if there is residual chemical contamination from past munitions use. I generate cross sections and groundwater contours; track project funding, invoice clients for work performed.

**7. What is the best and worst thing about your current job?**

The best thing about my current job is that I get to work with people all over the country, my job is always changing and new projects are always popping up. The worst thing is having to account for every 0.25 hours of my time each day.

**8. What was your first geology job out of college or weirdest geology job and learn anything you would like to pass on?**

My first job was pretty typical and included water sampling from wells, stream gauging, soil sampling, and waste sampling mostly. One thing I learned, as a consultant is to try not to turn down working on a job, even if you have no interest or experience in what they are



asking you to do. You may find something you really like to do or that one job may be that one thing that gets you hired for your next job.

**9. What is your dream geology job?**

Pretty much doing what I do now, but with more actual geology work and without a time sheet.

**10. What is your favorite PA geology site/fun fact/phenomenon, etc.?**

My favorite PA geology site is the PA Grand Canyon, near Wellsboro, PA. I spent lots of time there growing up at my family's cabin not far from there. It's best in the fall with the leaves changing and a crisp bit in the air.

**11. What is one class you wish you would have taken in college? (doesn't have to be a geology class).**

I wish I had taken a few accounting or business classes; it would have come in handy now.

**12. What is the most exciting place you have been geologically?**

The badlands of Wyoming.

**13. What is your favorite or least favorite "Bad" geology movie and why?**

My "favorite" is a tie...between "the core" because it came out when I was in college and a big group of us went to see it and when they crashed into the giant amethyst crystals we all yelled simultaneously "Oh my God, they are in the center of a giant geode!" and Dante's Peak when grandma pushed the little aluminum boat across the acid lake....the boat was fine, grandma...not so much.

**14. What's your favorite rock, mineral, or fossil?**

I have a few but one of my favorites is a very ugly, sort of non-descript grey rock, which is a hunk of mélangé collected near Bancroft, Ontario Ca. It doesn't look too impressive more like toothpaste that has hardened. But when you think of the pressure and tectonic forces that transformed a coherent rock into a flowing ooze in a fault zone it's pretty amazing

**15. What's the #1 most played song on your iPod?**

If I had an iPod, I think it would be Royals by Lorde, this week.

**16. What is one of your favorite quotes?**

Ginger Rodger's could do everything Fred Astaire did but she did it backwards and in heels.

**17. If you could choose anyone, who would you pick as your mentor?**

I have actually been really lucky throughout my life to find good mentors. My first mentor was my mom, she was a biology major in college and always encouraged me in my various science interests from my various rock and sea shell collections and digging "fossils" in the back yard to making chemical set volcanoes that stunk up the house, to taking in any stray animal because I was going to be a vet (before I knew you could grow up to be a geologist).

**DID YOU KNOW . . . ?**

- The exact dating of the Triassic-Jurassic boundary has been poorly understood, hampering our understanding of events such as the end-Triassic mass extinction and eventual biotic recovery, but recent U-Pb zircon dates tied to ammonite biochronology indicate that the Triassic-Jurassic boundary probably occurs around 200 to 205 million years ago.
- Geophysical researchers using seismic methods have found a subglacial stream channel 0.6 miles wide and 23 feet deep beneath the Ross Ice Shelf of Antarctica.
- Collisional mountain-building episodes are driven largely by subduction and accretion of material at convergent margins, accompanied by shortening, thickening, and heating of deformed crust.
- The Rocky Mountains, one of the longest mountain chains on Earth began forming between 66 million and 75 million years ago.
  - The northern and southern sections of the Rockies formed within 125 miles of the west coast of North America by the same volcanic processes currently occurring in the Cascade Range.
  - The central section of the Rockies formed over 620 miles inland, which is unusual – no

modern analogs exist to help explain this phenomenon.

- Even the Himalayas, which are forming far inland, don't work as an analog because they result from the Indian subcontinent crashing into southern Asia.
- No large landmass crashed into North America's western shores when the Rockies began forming.
- Instead, a slab of oceanic crust moved eastward and was subducted beneath the lighter North American continental plate.
- The Suwannee terrane, is an "orphaned" block of crust from Gondwanaland that extend into the subsurface of North America beneath southern Alabama, Georgia, and South Carolina.
- New and existing dates on lava in the Grand Canyon indicate that there were four major episodes when lava flows either erupted into the canyon or flowed over the rim into it; these occurred at 725-475K years ago, 400-275K years ago, 225-150K years ago, and 150-75K years ago.
- Wind-blown dust kicked up by off-road vehicles at Nellis Dunes Recreation Area in Nevada contains high levels of naturally occurring arsenic, almost 10 times the level found in normal soils; researchers also found palygorskite, a naturally-occurring fibrous clay mineral that has many of the same characteristics as asbestos but is not regulated like asbestos.
- The Green River, where it flows across the center of the Colorado Plateau, has incised the plateau at about 17 inches per 1,000 years over the past 100K years.
- Earth's topography is primarily controlled by lateral differences in the density structure of the crust and lithosphere.
- Lake Taupo on the north island of New Zealand lies in a caldera created by a supervolcanic eruption, known as the Oruanui eruption. That occurred approximately 26,500 years ago. It ejected an estimated 281 cubic miles of material and caused more than hundred square miles of surrounding land to collapse and form the caldera.
- East Antarctica's great ice sheet was even bigger than it is today 14.7M years ago, based on data from a 3,600-foot-long core drilled off the Antarctic coast in McMurdo Sound.
- Geochemical research on rocks from Pike County, Arkansas, suggest the rocks are more than 3,000M years old, but they appear to be younger because later pulses of molten rock from deep in the crust altered their chemistry.
- Storms in drought-affected areas of East Asia in 2010 were responsible for five of the thickest and most divided pollutant dust clouds ever recorded in

American airspace; NASA satellites tracked multiple layers of airborne dust from China's Taklimakan and Gobi deserts entering North American air at altitudes between 1.2 and 6 mile and as much as 1,250 miles wide.

- Researchers from the University of British Columbia and the University of Copenhagen examined South African soils and found that oxygen appeared in Earth's atmosphere about 3,000M years ago, or about 700M years earlier than previous thought.
- Alrosa, the state-controlled diamond mining company of Russia, reported recently that they found a 235-carat, gem-quality diamond at a mine in Siberia that is valued at \$1.5 to \$2 million US.
- The chemical composition of seawater within the pore spaces between sediment grains provides important information about what reactions occur there and how fast they happen.
- The origin of deep earthquakes differs fundamentally from the origin of shallow earthquakes (less than 30 miles deep), which relies on the properties of brittleness and friction; as pressure and temperature increase with depth, plasticity within the crystalline structure of the rocks allows the rocks to succumb to creep or flow, rather than to the kind of brittle fracturing seen at shallower depths.
- The first tetrapods (four-legged animals) were amphibians that evolved from the Devonian crossopterygian fishes living in shallow, marshy locations and already possessed lungs for respiration and lobed fins to support their bodies on muddy banks of ponds, rivers and marshlands.

### PGS Website of the Month

<http://tolweb.org/tree/phylogeny.html>

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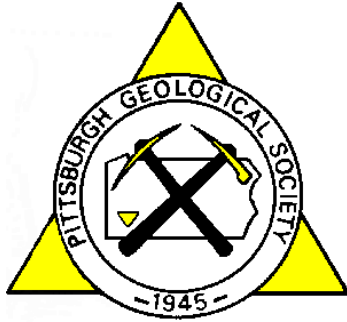
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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 5

Robert Botterman, Editor

January, 2014



Wednesday, January 15, 2014

The Pittsburgh Geological Society presents

*Management Strategies for Salt Water Intrusion in an Atlantic Coastal Plain Aquifer System: Hilton Head Island as a Case Study"*

and

*"Professional Licensure and ASBOG - The National Association of State Boards of Geology: Emphasis on the Fundamentals of Geology Examination"*

**Richard K. Spruill, PhD, Associate Professor of  
Geology/Hydrology – East Carolina University – Greenville, NC**

Dr. Spruill received his B.S. and M.S. in Geology from East Carolina University, and his Ph.D. in Geology from UNC-Chapel Hill in 1980. Dr. Spruill is a hydrogeologist specializing in the evaluation and development of the groundwater resources of the Atlantic Coastal Plain. He has worked closely with municipalities, industries (including the recreation industry), and the regulatory community to provide scientific insight during the planning and development of large-scale groundwater withdrawal projects. His areas of specific expertise include evaluation of the safe yield of aquifers and aquifer systems through detailed aquifer testing, well-head protection planning, and the evaluation of the position and movement of the salt-water/fresh-water interface in coastal environments. He is particularly interested in groundwater protection regulations, such as the Capacity Use Area program administered by the Division of Water Resources, and he has played a significant role in bringing to the forefront the major problems facing North Carolina groundwater users in the central Coastal Plain and in our coastal environments. His current research involves evaluation of the safe yield of the Cretaceous Aquifer System of the Central Coastal Plain of North Carolina. Along with several colleagues at ECU, he has developed an interest in flooding and estimation of flood recurrence intervals for typical Coastal Plain streams. He teaches courses in undergraduate general geology and petrology, and graduate courses in hydrogeology and computer applications in hydrogeology. He has also taught in the undergraduate summer geology field program in the four-corners region of the western United States for the last 19 years! Dr. Spruill is the Founding Director of the Coastal Water Resources Center at East Carolina University. Dr. Spruill is a co-owner of Groundwater Management Associates, Inc.; a North Carolina based consulting hydrological firm, the three-term Chairman of the North Carolina Board for Licensing of Geologists, and the past President of the National Association of State Boards of Geology.

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**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at: [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, December 16.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

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## 12th ANNUAL STUDENT NIGHT

Co-sponsored by:

**Pittsburgh Geological Society**

**Association of Engineering Geologists**

**American Society of Civil Engineers-Geotechnical  
Division**

Students, please consider taking advantage of an opportunity to present your research and compete in this sponsored event from PGS, AEG, and ASCE, at the 12th Annual Student Night on **Wednesday, April 23** at Foster's Restaurant, #10 Foster Plaza, Greentree.

If you have been conducting undergraduate or graduate research in any geologically or geotechnically related field, here is an opportunity to show off your work to members of the three societies, and receive the benefits that go along with it. Students that present their original research grow from the experience by improving their public speaking skills, networking with professionals and experts in their fields, and even a cash award!

Abstracts of **300** words or less should be emailed to Dr. Kyle Fredrick at [kyle.fredrick@calu.edu](mailto:kyle.fredrick@calu.edu) by **Monday, March 17, 2014** for consideration.

Each of the three sponsoring societies will select one student paper (graduate or undergraduate) for oral presentation. Additional abstracts will be accepted for poster presentations. All presenters will receive certificates of recognition and appreciation, as well as complimentary dinner. The three oral presenters will each receive awards of \$100, while the three top poster presenters will each receive \$50.

Students: please consider disseminating your research at this auspicious professional venue.

Professors: please pass this information on to your students who are doing research.

### CONSULTANTS LIST UPDATE

PGS is updating the Consultants Listings on the Society's website. Please review your company's entry in the Consultants list on the website at ([www.pittsburghgeologicalsociety.org/consultant2013.doc](http://www.pittsburghgeologicalsociety.org/consultant2013.doc)). Any new entries or updates to existing entries should be sent to [Ericailove@hotmail.com](mailto:Ericailove@hotmail.com).

Please be sure to include the primary county your office is located in and your Areas of Expertise codes (G-General, EG-Engineering and Geotechnical, HW-Hydrogeology and Water, E-Environmental, OG-Oil and Gas, C-Coal, MR-Mineral Resources, DS-Database Services

Entries should be in the following format

Company Name – Service Area/Office if more than one location - Area of Expertise Codes (all that apply)

County:

Address:

Telephone:

Fax:

Email:

Web address:

Contact Person:

1 - 2 sentence description of capabilities.

### STUDENT FIELD WORKSHOP

PGS will be sponsoring the Student Field Workshop this coming Spring 2014 (Saturday at the end of March or beginning of April). The Workshop will take place at California University of Pennsylvania.

The Workshop will include:

- Soil & Rock drilling demonstration
- Sample collection
- Basic groundwater sampling procedures
- Basic soil/rock descriptions
- An informal rock coring demonstration on the Friday before the actual Workshop.

We have been listening to comments and suggestions from past students and will be including more "real world" scenarios.

We are limiting the number of attendees to 30 (no more than 8 per college/university) – so watch the PGS Newsletter for registration information.

If you have any pre-registration questions or comments, please contact Frank Benacquista at [fbenacquista@kuresources.com](mailto:fbenacquista@kuresources.com).

### ORIGINS OF WESTERN PA PLACE NAMES

Jonathan Titus, a native of Blair County, PA, settled along the banks of what is now called Oil Creek in southeastern Crawford County in 1796. By 1810, enough people had joined him that they could establish a village, which Titus named Edinburgh. The village continued to grow as a result of its primary industry, lumbering, and the townsfolk eventually changed the name to Titusville in honor of their founder. It became incorporated as a borough in 1849. Oil had been well

known in the area for centuries – the Seneca Indians had been gathering it from seeps along the creek and using it for waterproofing canoes and clothing, as well as for both internal and external medicine – long before Europeans came to North America. When Europeans came to the area, they also exploited the seeps for waterproofing, lighting, lubrication, and medicine. But there was no way to produce the oil in an economical manner until 1859, when a man named Drake came to town with his salt-well drilling rig and founded the modern petroleum industry. Besides the petroleum industry, one of Titusville’s other many claims to fame is its native son, John Heisman, for whom the Heisman Trophy is named.

## **AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS’ HOUSE OF DELEGATES**

The AAPG House of Delegates is made up of elected members from AAPG-affiliated geological societies representing both the US sections and International regions throughout the world. Currently PGS is represented by two delegates: Dan Billman of Billman Geologic and Andrea Reynolds of Shell Appalachia.

The number of Delegates representing a local affiliate is determined by the number of AAPG Members it has in its chapter, with one delegate representing 70 local AAPG members. Delegates serve a three-year term and are selected by popular vote in an election by the AAPG voting members of the local affiliate. Please note that only full AAPG Members who have officially registered with AAPG with PGS as their local affiliate may vote in the delegate election. It is worth checking your AAPG membership status as well as your local society affiliation\*, as many “members” of AAPG are actually “Associates” rather than full Members, and newer members who have relocated to Pittsburgh may not have updated their local affiliation upon arrival. If you are an Associate, you should consider fulfilling the requirements to “transfer” to Member status, which is intended for all professional geoscientists\*\*.

*\* To check your AAPG status and affiliation, call AAPG Membership Department at 1-800-364-2274. Any changes to affiliation must be done by phone. To check membership status/type, visit <http://members.aapg.org/index.cfm>, log-in, and select “Print Membership Card”. Your AAPG membership classification is printed on the card – either Member (includes Emeritus and Honorary), Associate, or Student.*

*\*\* To transfer from Associate to full AAPG Member, visit [http://www.aapg.org/member/application\\_member.cfm](http://www.aapg.org/member/application_member.cfm) and click on “Transfer Online” or print and email the word or pdf forms to AAPG. Local AAPG members – and your current delegates (Dan and Andrea) – can serve as sponsors for the transfer between Membership classes.*

At this time, PGS has one delegate position up for Election; therefore PGS is seeking individuals willing to become an AAPG Delegate. This delegate would serve a 3-year term from July 1st, 2014 through June 30th, 2017. AAPG Delegates must also be full members of AAPG (associate members cannot run for AAPG offices).

A primary duty of the Delegate is to represent the AAPG members of the affiliated society (in our case the PGS) at the National AAPG Meeting (typically in the spring) and the Eastern Section AAPG Meeting (typically in the fall). Attendance at both of those meetings is required. The upcoming National AAPG meetings that the delegate would be expected to attend are planned for Denver, CO in 2015, Calgary, Alberta, Canada in 2016 and Houston, TX in 2017. The upcoming Eastern Section AAPG 2014 and 2015 meetings are to be held at London, Ontario, Canada and Indianapolis, IN, respectively. The 2016 Eastern Section meeting has yet to be determined.

Other duties of the delegates include:

- Being familiar with AAPG’s Constitution and Bylaws;
- Being acquainted with AAPG's current policies and programs;
- Informing the leaders of their society or region regarding AAPG's program of activities, especially as it relates to cooperative participation between AAPG and affiliated societies;
- Processing requests from the AAPG Executive Committee for information regarding eligibility of applicants for membership in AAPG;
- Actively soliciting applications from eligible geologists for membership in the AAPG.
- More details can be found on the AAPG House of Delegates website:  
<http://www.aapg.org/business/hod/about.cfm>

If you are interested in running for the open AAPG Delegate position, please contact Albert Kollar at [KollarA@carnegiemnh.org](mailto:KollarA@carnegiemnh.org).

## PITT GEOLOGY CLUB SWEATSHIRTS



Pitt Geology Club is placing an order for University of Pittsburgh Geology Department sweatshirts on January 31, 2014 to raise funds for a trip to Vermont/New Hampshire this upcoming summer. Sweatshirts are blue and gold (only) and available for \$35.00 for sizes S to XL, \$36.00 for XXL, and \$36.50 for sizes XXXL (mens). Orders will be accepted at the January PGS meeting and payment is due when orders are placed. Cash or check made out to "Underground Printing" are acceptable. Sweatshirts will be delivered at the PGS meeting in February. If you can't make the January meeting, please send your name, size, and a check, to Pitt GeoClub C/O the University of Pittsburgh Geology Dept., 4107 O'Hara St. Pittsburgh, Pa 15213. Checks must be received by 1/31/2014.

### PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting one of our student members each month. Our student member of the month is Sage Wagner. Look for the same treatment for additional members in the coming months.

**1. Name, email:**

Sage Wagner, [j.e.wagner3@iup.edu](mailto:j.e.wagner3@iup.edu), 717-422-0926

**2. Education (school, degree, expected graduation date):**

Indiana University of Pennsylvania, B.S. in Geology, May, 2014

**3. Internships or previous company history:**

**Dynamic Earth Teaching Assistant** - Assisting Dr. J. Lewis, Indiana University of Pennsylvania (Fall 2013); providing peer tutoring for all non-major students in all sections of lecture and lab; assisting in administering and proctoring course exams.

**Seascape Evolution Laboratory Research Assistant** - Working with Dr. T. Gerber, Indiana University of Pennsylvania (Spring 2013). 3D seismic volume interpretation integrated in

IHS Kingdom, in order to map submarine canyon-fill architecture: erosional surfaces, accretion surfaces, slump and slide deposits. Data set located offshore Nova Scotia.

**4. How long have you been a member or PGS?**

I have been a member of PGS for about 2 years now. I really enjoy the talks and encourage my colleagues at IUP to attend meetings as much as possible.



**5. Any ideas on student related activities that you wish PGS would do?**

I personally would really enjoy participating in any upcoming field trips. Any time spent in the field is time well spent. I also look forward to presenting my undergraduate research work during the 2014 PGS Student Night.

**6. Are you working on any research topics, please list title, describe?**

Working with Dr. Katie Farnsworth, my project will focus on detecting relevant morphological changes along the East Scotian Canyon System (ESCS), offshore Nova Scotia. Submarine drainage networks were extracted from a multi-beam bathymetry dataset of 25-meter grid size and were analyzed in ArcGIS to provide a morphometric methodology to characterize submarine drainage networks at fine resolution scales. This work has the potential to expand existing models for

deepwater processes and resulting submarine drainage networks to high-latitude margins influenced by proglacial sedimentary processes. Look for my poster presentations at both AAPG Annual Convention and Exhibition 2014 in Houston, TX and 2014 GSA Northeastern Section Meeting, Lancaster, PA.

**7. What are your plans following graduation? (Continuing with your education, academia, or into the job market)?**

My interest in pursuing a master's degree stems from my desire to make an impact as an integral member of a university's research group. I am very keen to work on a master's thesis that will result in multiple publications in a peer-reviewed journal. This is the hallmark of solid research and it will position me for my second goal, earning a Ph.D.

**8. What is the most exciting place you have been geologically or one place you wish you could visit?**

Leading my Summer 2013 Field Geology class group on a ridge line traverse of a doubly plunging anticline while mapping contacts as we ascended, our arduous hike was rewarded with both the spirit of camaraderie from accomplishing our objective collectively but also the perspective changing view of the South Branch Potomac River meandering through the West Virginia mountains. It was at this moment that I realized that a career in geology perfectly fits my personality.

**9. What is your favorite or least favorite "Bad" geology movie and why?**

I remember watching Dante's Peak during my high school Earth Science class and I found it to be absolutely appalling. Even non-geologists should recognize that rubber tires CAN NOT drive through pyroclastic flows.

**10. What's your favorite rock, mineral, or fossil?**

Carbonates, smectite, and trilobites. In the Summer of 2013, I worked for Dr. John Taylor as a Paleontological Laboratory Assistant where I processed rock samples, classified Cambrian-Ordovician trilobite specimens, and prepared collections for photographs. After spending hours working in his lab, I would walk home to my apartment spotting trilobite cephalons in the concrete.

**11. Anything else you would like to share about yourself?**

The cacophony of colliding breaking waves mixed with 174 mph winds leaves vivid memories of the devastation that I experienced living in Pass Christian, Mississippi, a direct hit for the eye of Hurricane Katrina. Following the rising storm surge, my family and our pets were forced to take refuge on the top bunk of my sister's bed. This life-changing natural disaster piqued a profound interest in the convoluted relationship between human beings and the natural processes that occur on Earth. I find geoscience captivating in that it not only addresses core academic questions such as interpreting the provenance of mass transport deposits within deep-water fields but also addresses practical problems such as developing innovative models for extracting resources from unconventional reservoirs.

**PGS PROFESSIONAL MEMBER FEATURE**

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is Brian L. Fritz. Look for the same treatment for additional members in the coming months.

**1. Name/certifications:**

Brian L. Fritz, M.S., Registered Professional Archaeologist

**2. Company, title or role, years with company:**

Quemahoning LLC, Principal Investigator and owner, 5 years

**3. How long have you been a member or PGS?**

Since 2002.

**4. Have you held any officer positions (can you remember when)?**

Not in PGS, past president of the Society for Pennsylvania Archaeology, current member of the Pennsylvania Historic Preservation Board.

**5. Education:**

B.S. Geology, Clarion University of Pennsylvania, B.A. Anthropology, Clarion University of Pennsylvania, M.S. Geology, University of Akron.





**6. What are some of your day to day responsibilities in your current role?**

I oversee all aspects of a cultural resources management (contract archaeology) firm, including field excavations, total station mapping, soil geomorphology, GIS analysis, artifact analysis, and report writing.

**7. What is the best and worst thing about your current job?**

Worst-not enough time to get everything done, Best- every new contract or project is a new challenge, often requiring new methods and theoretical approaches.

**8. What was your first geology job out of college or weirdest geology job and did you learn anything you would like to pass on?**

I owned and operated a surface bituminous coal mining company for ten years before going to college. Resource exploration and mine site development were my favorite tasks.

Running a successful business is as hard as earning a graduate degree. Give due respect to any successful business owner who did not have the time or opportunity to go to college. Their hard-earned real-world education is none less than yours.

**9. What is your dream geology job?**

I'm doing it. I bring geology into archaeology.

**10. What is your favorite PA geology site/fun fact/phenomenon, etc.?**

Any place that has boulder cities or interesting soils and sediments.

**11. What is one thing you wish someone would have told you when you were starting out in the geology profession?**

An MBA would be useful.

**12. What is one class you wish you would have taken in college? (doesn't have to be a geology class)**

Climatology, ecology, among many others

**13. What is the most exciting place you have been geologically?**

Tetons, Snake River Valley, Yellowstone

**14. What is your favorite or least favorite "Bad" geology movie and why?**

Most movies are bad at portraying scientific concepts and principals, or even common sense. Disaster moves like 2012 annoy me.

**15. What's your favorite rock, mineral, or fossil?**

Chert. I have the largest geologically sourced comparative collection in Pennsylvania.

**16. What's the #1 most played song on your iPod?**

Don't have an iPod. My car radio stays on NPR, and my office workstation streams movie scores.

**17. What is one of your favorite quotes?**

"Coal is where you find it," some good advice from a veteran coal miner that I once knew. Drill logs only tell you what is under a six-inch diameter hole. You have to dig a big and expensive pit to find out what is between the drill holes.

**18. If you could choose anyone, who would you pick as your mentor?**

Someone with an MBA and lots of experience managing an environmental consulting firm, still looking.

**19. If you could meet any geologist, living or dead, who would you meet?**

Charles Darwin; he was ahead of his time in geology as well as biology.

## 20. Anything else you would like to share about yourself?

To students pursuing their college degree, approach every class as though it were your major. Every class, no matter how far removed from your major, has some important insight to offer. It is your job as a student to seek out and find those meaningful connections that thread together all fields of knowledge.

### DID YOU KNOW . . . ?

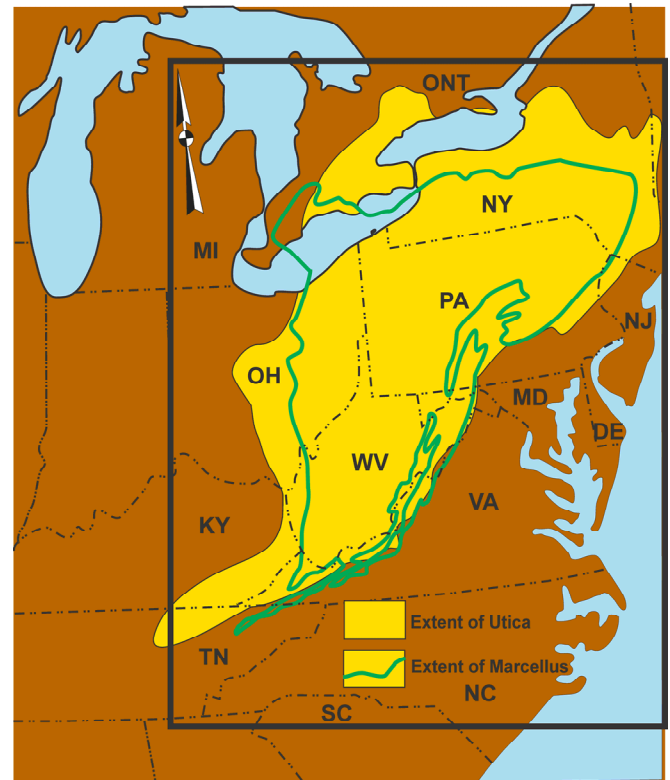
- The last time the North American oceanic/atmospheric system went through a major reorganization was during the Younger Dryas, a cold period at the end of the Wisconsinan glaciation that lasted about 1,100 years.
- Large, economically important Precambrian iron formations originated primarily from biochemical sediments that recorded oceanic and atmospheric chemistry and circulation on extensive continental shelves near the end of the Archean.
- But . . . fluvial iron formations also occur where terrestrial and marine realms mixed, and the iron-precipitation process shifted toward landward and estuarine environments as iron was derived from both terrestrial weathering and coastal upwelling.
- Global climate and sea level varied greatly from the Late Ordovician through earliest Silurian, and included a peak glacial episode that occurred somewhere around 444M years ago.
- Canadian paleontologists have found the 70M-year-old skeletal remains of a baby *Chasmosaurus* (relative of the more recognizable *Triceratops*) in the Dinosaur Provincial Park 125 miles southeast of Calgary, Alberta; it is the smallest intact skeleton of its type ever unearthed. The media, of course, called it a “reptile”!!!
- Global climate models typically assume that major climatic changes occur synchronously over continental to hemispheric distances, but paleoclimate research has shown that such changes often are time-transgressive across continents.
- Widespread oceanic anoxia in tropical and subtropical areas, occurring in regions that probably were affected by upwelling and semi-restricted marine basins, indicate a period of warming and sea-level rise in the Late Ordovician seas.
- The Late Ordovician mass extinction was a two phase-event: 1) the first event occurred at the onset of glaciation about 445M years ago with the loss of oceanic anoxia; 2) the second event occurred at the end of glaciation about 443M years ago and coincided with a return to anoxic conditions in the oceans.
- Plateaus, those large highland area of fairly level land separated from surrounding areas by steep slopes, are widespread on the planet; together with enclosed basins they cover about 45% of the Earth's land surface.
- Collisional orogenesis is driven largely by subduction and accretion of material at convergent margins, accompanied by shortening, thickening, and heating of deformed crust.
- Nuna (also called Hudsonland or Columbia) is the predecessor of the Late Proterozoic supercontinent Rodinia; the older supercontinent probably assembled during the Paleoproterozoic, somewhere between 1,900 and 1,750 M years ago, and fragmented during the Mesoproterozoic, around 1,500 to 1,200M years ago.
- The Silurian and Devonian volcanic rocks of the Coastal Volcanic belt in eastern Maine formed during convergence of the Avalonian plate with the leading edge of the Laurentian plate just before and during the early stages of the Acadian orogeny.
- Many high-latitude river systems are still adjusting to base-level changes since the last glaciation ended about 11K years ago.
- Humans are obviously having an influence on the Earth, including its hydrosphere; recent hydrologic changes associated with land use and climate change have increased flow in some rivers, leading to higher sediment loads from increased erosion of farm fields as well as increased bank and bluff erosion in stream valleys.
- Believe it or not, native gold can be found in Pennsylvania if you know where to look – it is best to pan in streams in Adams, Lancaster, and York counties.
- Groundwater depth is critical in assessing the regional potential for triggering liquefaction during an earthquake, such as occurred in the

Mississippi valley during the New Madrid earthquakes of 1811-1812.

- The development and maintenance of a channeled sub-glacial network depend on sustained high rates of surface melting maintaining high supra-glacial input; in consistently warm summers, sub-glacial drainage becomes quickly and persistently channeled, whereas distributed sub-glacial drainage occurs during cooler summers.
- Magmatism that occurred in the southern Grenville Province from 1,200 to 1,150M years ago tells the tale of a collisional/post-collisional history in the Adirondack Lowlands of New York and the Frontenac terrane of Ontario.
- Field studies of lava flows have always been hampered by difficulties of access – older flows have rough surfaces that are difficult to walk on and active flows are hot and extremely dangerous – but the use of LiDAR is revolutionizing both the visual and quantitative analysis of such flows.
- Except for about 65 miles along its southernmost area, the Sierra Nevada was extensively glaciated during the Pleistocene.
  - Approximately 1,700 small glaciers and ice masses currently occurring above 10,660 feet elevation near the crest of the Sierra covered an area of about 19 square miles in 1972.
  - Fourteen of the largest of these glaciers decreased in size by about 1/2 in area from 1900 to 2004.
  - Rock glaciers, ice covered by as much as 30 feet of debris from rock falls, on average occur 650 to 1,000 feet lower on the mountains, probably because the debris insulates the ice from the heat and wind erosion.
  - Abundant lakes within the area maintain a record showing that the upper part of the glacial system was erosive over a broad highland area as the evenly distributed ice in the accumulation zone moved to lower elevation.
  - The lower part of the glacier system was largely confined to major preexisting river canyons where melting dominated.
- The Reelfoot rift is a N45°E-trending Cambrian rift that controlled late Pliocene and

Quaternary deformation as well as current seismicity beneath the central Mississippi River Valley.

- The first significant radiation of terrestrial life on earth occurred during the Devonian period when vascular plants began to spread across the continents and formed extensive forests; by the mid-Devonian, some plants types had evolved leaves and true roots, and the first seed-bearing plants appeared by the end of the Devonian.



Extent of the Upper Ordovician Utica Shale in the Appalachian basin, with an outline of the extent of the Marcellus shale for comparison.

### PGS Website of the Month

<http://www.philageo.org>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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**PGS Board-of-Directors**

<b><u>President:</u></b>	Albert Kollar	<b><u>Director-at Large:</u></b>	Tamra Schiappa	<b><u>Director-at Large:</u></b>	Bill Adams
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<b><u>Past President:</u></b>	Mary Ann Gross	<b><u>Director-at Large:</u></b>	Ken LaSota		
<b><u>Other PGS Positions</u></b>		<b><u>AAPG Delegate:</u></b>	Dan Billman	<b><u>AAPG Delegate:</u></b>	Andrea Reynolds
<b><u>Webmaster:</u></b>	Mary McGuire	<b><u>Newsletter Editor:</u></b>	Robert Botterman	<b><u>Historian:</u></b>	Judy Neelan

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412.622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724 938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412 809-6723 (cell), or [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 464-0525, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).

Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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## **PGS THANKS OUR CORPORATE SPONSORS**

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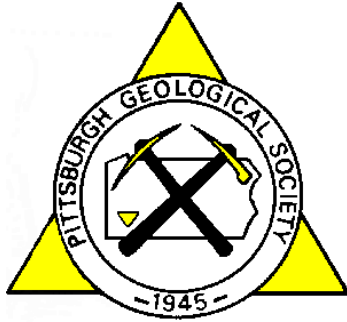
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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 6

Robert Botterman, Editor

February, 2014



**Monday, February 24, 2014**

The Pittsburgh Geological Society and  
ASCE G-I present

## *"Seismic Modeling & Applications of FD Modeling to Rock Physics and Geomechanics"*

AAPG/SEG Inter-Society Distinguished Lecturer

**Joseph Stefani, Senior Consultant at Chevron Energy Technology  
Company, San Ramon, CA**

Funded by the AAPG, the SEG, and by the AAPG Foundation J. Ben Carsey Endowment



Joe Stefani received degrees in engineering and geophysics from Cal and which time he has been involved in a range of geophysical R&D, including high fidelity earth and seismic modeling, acquisition, anisotropy, inversion, and general Aki & Richards stuff. Most recently he has helped to build the SEG SEAM Phase 1 and Phase 2 earth models.

Earth modeling, from the construction of subsurface structure and stratigraphy, to the accurate understanding of rock physics, through the simulation of seismic and nonseismic responses, is an enabling technology to guide decisions in acquisition, processing, imaging, inversion and reservoir property inference, for both static and time-lapse understanding. So it is crucial to capture those earth elements that most influence the geophysical phenomena we seek to study. This is notoriously difficult, probably because we regularly underestimate how clever the earth can be in producing various geophysical phenomena.

The main part of the talk focuses on methods we have used in building complex earth models (both overburden and reservoirs) and their seismic simulations, emphasizing the challenge to reproduce the appropriate features observed in real data. Questions to consider are the quality of the seismic data that will act as a guide in the model building, and that of the well logs used to quantify the rock physics. Another consideration is the amount of physics to include in the geophysical response simulation, which is a tradeoff between computational load and acceptable characterization of the data features.

Finally, the industry workhorse for seismic modeling continues to be the time-domain finite-difference (FD) algorithm, mainly because of its balance between accuracy and efficiency, simple concept and gridding, and ease of programming on various hardware platforms. Because of this simplicity, and the growing interest in time-lapse and geomechanical problems, a short treatment is included of how FD modeling can be adapted to problems in rock physics and geomechanics from core to basin scales.

**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person**, students **\$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at: [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Wednesday, February 19.**

**Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.**

## 12th ANNUAL STUDENT NIGHT

Co-sponsored by:

**Pittsburgh Geological Society**

**Association of Engineering Geologists**

**American Society of Civil Engineers-Geotechnical  
Division**

Students, please consider taking advantage of an opportunity to present your research and compete in this sponsored event from PGS, AEG, and ASCE, at the 12th Annual Student Night on **Wednesday, April 23** at Foster's Restaurant, #10 Foster Plaza, Greentree.

If you have been conducting undergraduate or graduate research in any geologically or geotechnically related field, here is an opportunity to show off your work to members of the three societies, and receive the benefits that go along with it. Students that present their original research grow from the experience by improving their public speaking skills, networking with professionals and experts in their fields, and even a cash award!

Abstracts of **300** words or less should be emailed to Dr. Kyle Fredrick at [kyle.fredrick@calu.edu](mailto:kyle.fredrick@calu.edu) by **Monday, March 17, 2014** for consideration.

Each of the three sponsoring societies will select one student paper (graduate or undergraduate) for oral presentation. Additional abstracts will be accepted for poster presentations. All presenters will receive certificates of recognition and appreciation, as well as complimentary dinner. The three oral presenters will each receive awards of \$100, while the three top poster presenters will each receive \$50.

Students: please consider disseminating your research at this auspicious professional venue.

Professors: please pass this information on to your students who are doing research.

### CONSULTANTS LIST UPDATE

PGS is updating the Consultants Listings on the website. Please review your company's entry in the Consultants list on the website ([www.pittsburghgeologicalsociety.org/consultant2013.doc](http://www.pittsburghgeologicalsociety.org/consultant2013.doc)). Any new entries or updates to existing entries should be sent to [Ericailove@hotmail.com](mailto:Ericailove@hotmail.com).

Please be sure to include the primary county your office is located in and your Areas of Expertise codes (G-General, EG-Engineering and Geotechnical, HW-Hydrogeology and Water, E-Environmental, OG-Oil and Gas, C-Coal, MR-Mineral Resources, DS-Database Services

Entries should be in the following format

Company Name – Service Area/Office if more than one location - Area of Expertise Codes (all that apply)

County:

Address:

Telephone:

Fax:

Email:

Web address:

Contact Person:

1 - 2 sentence description of capabilities.

### PGS MEMBERS RETURN TO 6<sup>TH</sup> GRADE



Ray Follador and Albert Kollar presented on Friday, January 10th, Marcellus Shale and Energy of Western Pennsylvania to the Shadyside Sixth Grade Earth Science class - Matt Brunner is the teacher. There were four sessions lasting 50 minutes each. Ray and Albert split the class time into 25 minute each and received many excellent questions on the Marcellus.

### TEASER FOR MARCH

Susan Eaton from SR ECO Consultants is an Association for Women Geoscientists Distinguished Lecturer. She will be presenting her work from Antarctica.

### NOMINATIONS & ELECTIONS

Being the month of February, it is a good time to consider becoming more involved in the Pittsburgh

Geological Society (Society). Over the next several weeks I will be approaching some of you non-student members who regularly, or semi-regularly, join us at our Wednesday meetings to consider a position on our Board or as an officer. I am looking to fill a ballot with qualified and energetic members by the April meeting prior to our May election.

If you have no previous experience in participating in the governing a professional society then you may want to consider becoming one of the 3 **Director at Large** positions that are filled every year by the Society. In this position you will assist the officers and committee chairs in the monthly functions of the Society. It is a great way to contribute to your Society while getting acclimated in its function. Membership on the Board does groom our future officers. The Director at Large position is a 2 year commitment and requires regular attendance at the Board meetings held 1 hour prior to the social hour of each monthly meeting.

If you are a past officer/board member I want you to know you are always welcomed back. Previous experience is very useful at our Board meetings whether you want to come back as an officer or take the gradual approach as a board member.

If you are an active member of the Society and have an interest in being a candidate, or know of a member that you think would be a good candidate, please contact **Ray Follador**, Nominations and Elections Committee Chair, ASAP at [geodawg@comcast.net](mailto:geodawg@comcast.net) or (724) 744-0399. A list of all candidates will be announced at the April meeting with the election to be held at the May meeting.

## ORIGINS OF WESTERN PA PLACE NAMES

What is now the Borough of Nanty Glo in Cambria County originated in the 1890s under the name Glenglade as a lumber camp on the south branch of Blacklick Creek. By 1899, coal attracted additional settlers, and the Pennsylvania Railroad installed a spur line through the community. Commercial mining began in 1896 with the opening of the Nanty Glo No. 1 mine. Nanty Glo was incorporated as a borough in 1918, and at one time had a chemical works, a soda bottling factory, a plastic factory, and a dress manufacturing firm, all of which are now defunct. The name Nanty Glo, probably given to the town by Welsh miners, is derived from the Welsh *nant y glo*, meaning “brook of coal”.

## PITT GEOLOGY CLUB SWEATSHIRTS



Pitt Geology Club is placing an order for University of Pittsburgh Geology Department sweatshirts at the end of February 2014 to raise funds for a trip to Vermont/New Hampshire this upcoming summer. Sweatshirts are blue and gold (only) and available for \$35.00 for sizes S to XL, \$36.00 for XXL, and \$36.50 for sizes XXXL (mens). Orders will be accepted at the February PGS meeting and payment is due when orders are placed. Cash or checks made out to “Underground Printing” are acceptable. Sweatshirts will be delivered at the PGS meeting following delivery. If you can't make the February meeting, please send your name, size, and a check, to Pitt GeoClub C/O the University of Pittsburgh Geology Dept., 4107 O'Hara St. Pittsburgh, Pa 15213. Checks must be received by 1/19/2014.

## PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting one of our student members each month. Our student member volunteer is Nicholas Darrow. Look for the same treatment for additional members in the coming months.

1. **Name, email:**  
[Ethan Shula, eshula@cedarville.edu](mailto:eshula@cedarville.edu)
2. **Education (school, degree, expected graduation date):**  
[B.S. Geology, Cedarville University](#)  
[Expected graduation: May 2014](#)
3. **Internships or previous company history:**  
[Geology Intern with Huntley and Huntley Exploration](#)
4. **How long have you been a member or PGS?**  
[Less than a year.](#)

5. **Any ideas on student related activities that you wish PGS would do?**

I think including specialized short courses/field trips only for student members would increase the number of participants. Attending group meetings and courses comprised solely of professional geologists may deter some students from attending due to a sense of insecurity and unfamiliarity with the subject matter.



6. **Are you working on any research topics, please list title, describe?**

I am currently in the midst of starting my senior research project which deals with the Utica-Point Pleasant interval of Ohio. We are attempting to conduct a study with the end goal of creating a more specified map, than currently exists, outlining the extent of oil content within the interval. In addition, the study will provide a number of potential target areas for exploratory drilling within the newly defined area.

7. **What's your favorite subject/area of study?**

In recent months I have become increasingly interested in the petroleum industry dealing with both geological and economic issues. I also really enjoy volcanology and varying aspects of igneous petrology.

8. **What are your plans following graduation? (Continuing with your education, academia, or into the job market)?**

My goal is to enter the workforce upon graduation this upcoming semester. If the appropriate opportunity does not present itself, I will most likely pursue further education within a master's program

9. **What is the most exciting place you have been geologically or one place you wish you could visit?**

Leading my Summer 2013 Field Geology class group on ridgeline traverse of a doubly plunging anticline while mapping contacts as we ascended, our arduous hike was rewarded with both the spirit of camaraderie from accomplishing our objective collectively but also the perspective changing view of the South Branch Potomac River meandering through the West Virginia mountains. It was at this moment that I realized that a career in geology perfectly fits my personality.

10. **What are your plans if money was not an issue?**

If I was in the position to do so financially, I would love to travel around the world following graduation.

11. **What is your dream geology job?**

Right now, my dream geology job would be to obtain a position in the natural gas industry with the task of dealing with both geological and economic aspects of the company.

12. **What is the most exciting place you have been geologically or one place you wish you could visit?**

The most exciting place I have been to geologically was Arizona, more specifically Sedona and the Grand Canyon.

13. **What is your favorite or least favorite "Bad" geology movie and why?**

The worst geology movie I have ever seen was Mt. St. Helens. The acting and "special effects" in the movie are pretty pathetic.

14. **What's your favorite rock, mineral, or fossil?**

My favorite mineral is Amazonite.



**15. What's the #1 most played song on your iPod?**

Well, I don't have an iPod, but if I did, the #1 most played song would be Love Me Again by John Newman.

**16. What is one of your favorite quotes (geology related or not)?**

"Put your brain in your pocket and just play."  
~my Dad

**17. Anything else you would like to share about yourself?**

I have played competitive soccer my entire life. I have also had the opportunity to compete at the NCAA D-I and D-II levels for Virginia Tech and Cedarville Universities men's soccer teams.

**PGS PROFESSIONAL MEMBER FEATURE**

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is Nicholas Darrow. Look for the same treatment for additional members in the coming months.

**1. Name/certifications:**

Nicholas Darrow

**2. Company, title or role, years with company:**

Geotechnical Testing Services, Inc. I am a laboratory technician with 2.5 years of experience in the geotechnical field.



**3. How long have you been a member or PGS?**

I am a new member of PGS (I just joined in the past few months).

**4. Have you held any officer positions (can you remember when)?**

No.

**5. Education:**

B.S. B.S. Degree in Environmental Science from Allegheny College in Meadville, PA.

**6. What are some of your day to day responsibilities in your current role?**

I am trusted with the time sensitive completion of compression testing, hydraulic conductivity tests on soil and concrete samples, direct shear, and triaxial shear tests, compaction, expansion index and CBR testing, and the production of final reports. Furthermore, I am responsible for conducting testing, documenting analysis, producing and communicating results and following up with clients when and as needed. I provide oversight to other lab technicians, along with communication with clients during the owner's absence. I am assigned and entrusted to produce results for clients when a short

**7. What is the best and worst thing about your current job?**

The best part of my current job is the flexibility of working in a small business. I am, for the most part, able to create my own hours. The worst part of my current job is the lack of upward mobility. As we only employ about 8 people, so there is not much room for personal growth within the company. As a young professional, I want to be able to prove myself and work my way up.

**8. What is your dream geology job?.**

As I am an Environmental Scientist, my dream job would be working on the ecological side of things. Performing habitat assessments and kick-netting were some of my favorite activities in college, so I would love to continue along that path.

**9. What is your favorite PA geology site/fun fact/phenomenon, etc.?**

As I studied in Meadville, PA, I have grown to have respect for the French Creek Watershed. The ecological diversity is astounding, and I enjoyed testing biodiversity at numerous locations along the creek.

**10. What is one thing you wish someone would have told you when you were starting out in the geology profession?**

Have a focus. I was wrong to not focus my studies in college towards a single area (stream ecology, renewable energies, consulting, etc.) I feel that this has stopped me from being seriously considered for environmental positions.

**11. What is one of your favorite quotes?**

"You miss 100% of the shots you never take" - Wayne Gretzky

**DID YOU KNOW . . . ?**

- Scientists have discovered a volcano in the Pacific Ocean 1,000 miles east of Japan that is approximately the size of New Mexico, making it one of the largest known in the solar system; Tamu Massif, as it is called, is about 145M years old.
- Exogeologists think it is extremely likely that they have discovered an ancient lake That could have sustained some microbial life at Yellowknife Bay, an area within the 96-mile-diameter Gale Crater on Mars where Curiosity landed and has been exploring.
- It seems the lake at Yellowknife Bay at one time had flowing water with neutral pH, low salinity, and carbon, hydrogen, oxygen, sulfur, nitrogen and phosphorous, all of which are important elements for life-forms such as the microbes that thrive in Earth's caves and hydrothermal vents.
- Geologists from Western Washington University have found that an 1872 intra-plate earthquake in California, hundreds of miles from the San Andreas Fault but around 7.7 to 7.9 on the Richter scale, was among the largest in California's history.
- The New Madrid Seismic Zone is not dead. USGS seismologists studying the central US zone have concluded that current seismic activity signals active, ongoing processes that continue to generate stress in the region that will eventually be released in future large earthquakes.
- The Utica Shale and associated Point Pleasant Formation have been receiving a lot of attention because they are yielding huge volumes of natural gas, natural gas liquids, and crude oil in wells drilled in eastern Ohio and western Pennsylvania.
- The USGS estimated that undiscovered, technically recoverable resources in the Utica and Point Pleasant indicate that these unconventional reservoirs contains about 38 trillion cubic feet of natural gas, about 940 million barrels of oil, and 208 million barrels of natural gas liquids.

- Most people never thought that Canada would become an important diamond-producing country until 1991 when two geologists found evidence of diamond-bearing kimberlite pipes about 200 miles north of Yellowknife in the Northwest Territories.
- Opals are popular as one of Nature's most spectacular gemstones; some opals can flash every color of the spectrum with an intensity surpassing that of a high-quality diamond, and the best opals can command prices rivaling the most expensive diamonds, rubies, and emeralds.
- The June 6th, 1912 eruption of the Novarupta volcano in peninsular Alaska, what is now called the Katmai National Monument, has been called the most powerful of the 20<sup>th</sup> Century. People in Juneau, Alaska, about 750 miles away, heard the sound of the blast over a hour after it actually occurred.
- In most countries on Earth, all mineral resources belong to the government, including all valuable rocks, minerals, oil, and natural gas found on or within the Earth – you can't legally extract and sell any mineral commodity in those countries without first obtaining an authorization from the government.
- The Eagle Ford shale of southeastern Texas has become one of the most heavily drilled rock units in the United States since 2008.
- Landslides occur in all 50 states, although the primary regions of landslide occurrence and potential are the coastal and mountainous areas of California, Oregon, and Washington, the States comprising the intermountain west, and the mountainous and hilly regions of the Eastern United States.
- See scientists are preparing for new data on comets as the European Space Agency's Rosetta spacecraft is set to become the first to orbit a comet and land a probe on its nucleus in November, 2014.

**PGS Website of the Month**

<http://humanorigins.si.edu/research>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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#### PGS Board-of-Directors

**President:** Albert Kollar  
**Vice President:** Kyle Frederick  
**Treasurer:** Steve McGuire  
**Secretary:** Judy Neelan  
**Past President:** Mary Ann Gross  
**Other PGS Positions**  
**Webmaster:** Mary McGuire

**Director-at Large:** Tamra Schiappa  
**Director-at Large:** Robert Botterman  
**Director-at Large:** Ray Follador  
**Director-at Large:** Erica Love  
**Director-at Large:** Ken LaSota  
**AAPG Delegate:** Dan Billman  
**Newsletter Editor:** Robert Botterman

**Director-at Large:** Bill Adams  
**Counselor:** Charles Shultz  
**Counselor:** John Harper  
**Counselor:** Mary Robison  
**AAPG Delegate:** Andrea Reynolds  
**Historian:** Judy Neelan

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412.622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724 938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412 809-6723 (cell), or [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 464-0525, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).  
Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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## **PGS THANKS OUR CORPORATE SPONSORS**

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**ARK Resources, Inc.**  
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Inc.**  
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LLC**  
**Rosebud Mining Co.**  
**THG Geophysics, Ltd.**

# **ANNOUNCEMENT**

## **Pittsburgh Geological Society Spring 2014 Student Field Workshop**

**Saturday April 5, 2014  
California University  
California, Pennsylvania  
Start: 9 AM      Finish: Late Afternoon**

**Early Registration: \$20.00  
Registration day of Workshop: \$25.00**

**: Frank Benacquista, PG at: [fbenacquista@kuresources.com](mailto:fbenacquista@kuresources.com)**

**The Pittsburgh Geological Society once again invites students of geology to attend the 10th installment of the  
“Student Field Workshop.”**

### **PLEASE CONTACT US TO SAVE YOUR PLACE**

**Send payments to hold spot on registration list:**

- **At February/March PGS Meeting**
- **Send to Frank Benacquista:  
c/o KU Resources/22 S. Linden Street/Duquesne/PA/15110**

**Cash or checks (payable to “Pittsburgh Geological Society”)**

**Have you wondered what you might be doing on that first job? Chances are you’ll be on a drill rig. You will have the opportunity to work along side an experienced drilling contractor and field-wise professionals. The Workshop will be supervised by professionals in the industry, so not only is this an excellent learning opportunity, it is your chance to ask all those questions regarding life after college. So brush up on those networking skills.**

**What will you experience?**

- **Soil sampling using a drill rig**
- **Soil & Rock descriptions**
- **Basic sampling techniques**
- **Well installation basics**
- **Basic monitoring equipment**
- **Designing a drilling program**

**As always, we will throw in lunch.**

**As all field work, this will be a RAIN or SHINE event. So watch the weather forecast carefully and prepare yourself. The drilling process can be dusty, wet, and muddy -- so leave the designer jeans and flip-flops behind.**

**We do ask that you be an active student – please no corporate trainees.**

**\*\*\*BONUS INFORMAL WORKSHOP: Friday April 4th\*\*\***

**In order to save some time and accommodate everyone for the formal Saturday Workshop we will  
start drilling on Friday**

**9 AM to 3 PM**

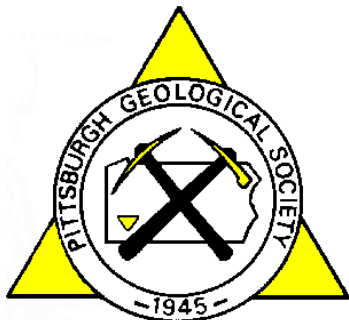
**Whenever you have the chance stop by and watch**

**SAI FARM MASTER PLAN**  
4/26/2011

Element	Count
1 Multi-Use Fields	6
2 Family & Resident Alumni Housing	42
3 Academic Field Station	New Bldg
4 Disc Golf Course	18 holes
5 Fintch and Purr Golf Course	8 holes
6 Amphitheater	yes
7 Pavilions	2
8 High and Low Ropes Course	yes
9 Parking Area(s)	22, 41, 30, 66
10 Greenhouse / Use Field (greenhouse)	no / softball
11 Skate Park	skatepark
12 Challenge Course	yes
13 Baseball / Softball	1 bb, 2 sb
14 Gradnas	2 acres +/-
15 Greenhouse	yes
16 Amphitheater	yes
17 Cross Country Track	yes

**FIELD SHOP LOCATION**





# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 7

Robert Botterman, Editor

March, 2014



Wednesday, March 19, 2014

The Pittsburgh Geological Society

## *A Geoscientist in Antarctica: Following in Shackleton's Footsteps One Hundred Years Later*

Susan R. Eaton, P. Geol., P. Geoph., M.Sc., B.J. (Journalism) Hon.  
President, SR ECO Consultants Inc.



Geology field schools can be tough—and sometimes they can be hazardous. During a recent geology field school in Antarctica, I became adept at running the gauntlet of lunging fur seals and lumbering elephant seals, their oversized proboscises flared outwards, exposing shiny pink gums and sizeable teeth... The old adage, "their bark is worse than their bite," doesn't ring true in Antarctica. Our seasoned guides cautioned us that a bite from a fur seal or an elephant seal would require the immediate administration of intravenous antibiotics...

Bitten by the polar bug, I returned to the Bottom of the World in 2013, participating in my third science-based expedition in three years. In 2013, I joined an expedition sponsored by the Geological Society of America ("GSA") and entitled "Antarctica, South Georgia and the Falkland Islands: Scotia Arc Tectonics, Climate and Life." Led by earth scientists from Pennsylvania State, the Jackson School of Geosciences (University of Texas at Austin), Stanford University and the Federal University of Rio de Janeiro, the expedition investigated the interplay of solid earth systems, plate tectonics, glaciology, oceanography, climate and life.

I traveled to the Southern Ocean with an intrepid group of 100 explorers from 15 nations—fifty percent of the group was female—aboard the MV Akademik Ioffe, a 117-meter-long, Russian ice-strengthened vessel. The GSA-sponsored group of explorers included 70 earth scientists (ranging in age from early twenties to late seventies) representing more than twenty specializations. In fact, there were enough Ph.D. geologists on the expedition to staff four or five university earth science departments!

A century ago, Sir Ernest Shackleton's scientific teams were comprised of geologists and geophysicists who explored Antarctica because it was there, and because it was unclaimed by any nation. During the heroic age of Antarctic exploration, geoscientists discovered volcanoes, mountain ranges, fossils, coal and minerals in this uncharted continent.

**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs \$25.00/person, students \$5.00; checks preferred. Reservations should be emailed to Steve McGuire at: [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com), please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, March 17.** Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.

And, in 1909, geoscientists in Shackleton's Nimrod Expedition planted the British flag at the Magnetic South Pole. During the heroic age of Antarctic exploration, geoscientists discovered volcanoes, mountain ranges, fossils, coal and minerals in this uncharted continent. And, in 1909, geoscientists in Shackleton's Nimrod Expedition planted the British flag at the Magnetic South Pole.

Today, earth scientists travel to Antarctica—the world's last remaining wilderness—to research planetary processes, including the impacts of climate change and ocean change. During the past fifty years, the Western Antarctic

Peninsula has warmed 3 degrees Celsius, triggering a cascading series of geological and biological changes in this fragile ecosystem which have global implications.

During the past three years, I've experienced numerous Serengeti moments, witnessing some of the largest concentrations of wildlife on the planet. Snorkeling in brash ice, I've come face-to-mask with 1,400-pound leopard seals, jaws agape—so close, that I could count the freckles on their upper palates and inspect their tri-serrated teeth which can dispatch 40-pound penguins in mere seconds. And, I've completed the "Leadership on the Edge Program," an Antarctic Outward Bound-like school led by British polar explorer Robert Swan, OBE.

Translating lessons from Antarctica, I've reached out to thousands of K-12 students, university students and the general public, empowering them to formulate scientifically-driven global solutions for today's social, economic, energy and global sustainability challenges.

Susan is a geologist, geophysicist, journalist and 'extreme' snorkeler.

She holds a B.Sc. Honours in Geology and Biology from Dalhousie University, a B.J. (Journalism) Honours from Carleton University, and a M.Sc. in Petroleum Geology (Geophysics Specialization) from Imperial College, University of London.

Susan is the Antarctic-Explorer-in-Residence for the American Association of Petroleum Geologists ("AAPG") and the Houston Geological Society ("HGS"). She is a speaker with the Association for Women Geoscientists' Distinguished Lecturer Program.

Susan has developed a successful career in the Canadian energy sector, attaining the position of vice president of exploration in several junior oil and gas companies. Through her wholly owned consultancy, SR ECO Consultants Inc., Susan consults to the Canadian, American and international petroleum and financial sectors, on oil and gas exploration and production, acquisitions and divestitures, environmental risk assessments and media relations.

Susan began her journalism career as a television news reporter with CBC-TV. Today, she reports on

science and technology, business, oil and gas, renewable energy, the environment, ecotourism and extreme snorkeling. Her articles and photographs have been published Canadian and American magazines and newspapers, including *EXPLORER Magazine*, the monthly publication of the AAPG.



*MV Professor Molchanov* at anchor near the Western Antarctic Peninsula and framed by the arch of a sculpted iceberg. Photo courtesy of Susan R. Eaton ([www.susanreaton.com](http://www.susanreaton.com))

## 12th ANNUAL STUDENT NIGHT

Co-sponsored by:

**Pittsburgh Geological Society**

**Association of Engineering Geologists**

**American Society of Civil Engineers-Geotechnical  
Division**

Students, please consider taking advantage of an opportunity to present your research and compete in this sponsored event from PGS, AEG, and ASCE, at the 12th Annual Student Night on **Wednesday, April 23** at Foster's Restaurant, #10 Foster Plaza, Greentree.

If you have been conducting undergraduate or graduate research in any geologically or geotechnically related field, here is an opportunity to show off your work to members of the three societies, and receive the benefits that go along with it. Students that present their original research grow from the experience by improving their public speaking skills, networking with professionals and experts in their fields, and even a cash award!

Abstracts of **300** words or less should be emailed to Dr. Kyle Fredrick at [kyle.fredrick@calu.edu](mailto:kyle.fredrick@calu.edu) by **Monday, March 17, 2014** for consideration.

Each of the three sponsoring societies will select one student paper (graduate or undergraduate) for oral presentation. Additional abstracts will be accepted for poster presentations. All presenters will receive

certificates of recognition and appreciation, as well as complimentary dinner. The three oral presenters will each receive awards of \$100, while the three top poster presenters will each receive \$50.

**Students:** please consider disseminating your research at this auspicious professional venue.

**Professors:** please pass this information on to your students who are doing research.

## NOMINATIONS & ELECTIONS

Being the month of February, it is a good time to consider becoming more involved in the Pittsburgh Geological Society (Society). Over the next several weeks, Ray Follador will be approaching some of you non-student members who regularly, or semi-regularly, join us at our Wednesday meetings to consider a position on our Board or as an officer. PGS is looking to fill a ballot with qualified and energetic members by the April meeting prior to our May election.

If you have no previous experience in participating in the governing a professional society then you may want to consider becoming one of the 3 **Director at Large** positions that are filled every year by the Society. In this position you will assist the officers and committee chairs in the monthly functions of the Society. It is a great way to contribute to your Society while getting acclimated in its function. Membership on the Board does groom our future officers. The Director at Large position is a 2 year commitment and requires regular attendance at the Board meetings held 1 hour prior to the social hour of each monthly meeting.

If you are a past officer/board member PGS wants you to know you are always welcome to come back. Previous experience is very useful at our Board meetings whether you want to come back as an officer or take the gradual approach as a board member.

If you are an active member of the Society and have an interest in being a candidate, or know of a member that you think would be a good candidate, please contact **Ray Follador**, Nominations and Elections Committee Chair, ASAP at [geodawg@comcast.net](mailto:geodawg@comcast.net) or call (724) 744-0399. A list of all candidates will be announced at the April meeting with the election to be held at the May meeting.

## ORIGINS OF WESTERN PA PLACE NAMES

Armstrong County was named in honor of John Armstrong (1717-1795), a civil engineer and soldier who served as a major general during the Revolutionary War and as a delegate to the Continental Congress for Pennsylvania. Armstrong County and its

incorporated communities have had a long history of providing numerous mineral resources to Pennsylvania's economy, including oil and natural gas, coal, iron ore, limestone, glass sand, and dimension stone. Among its many important contributions: Pittsburgh Plate Glass, now the \$15 billion-per-year PPG Industries, was founded in Ford City in 1883; in 1869, Leechburg became the first place in the country to use natural gas for producing iron products; and the list goes on.

## CHINESE FOSSILS AND VOLCANIC ASH

For years, paleontologists in China have been finding immaculately preserved fossils, including fish, small dinosaurs, birds, and mammals, in Cretaceous lake sediments in the northeastern part of the country. Small dinosaurs, such as *Psittacosaurus*, and birds, such as *Confuciusornis*, have been preserved with fish that still retain traces of delicate structures like air bladders. Many of these fossils exhibit the outlines of skin, feathers, and muscles, preserved by volcanic ash that covered the bodies before putrefaction. But the ash didn't just entomb these animals – it also killed them. Under the microscope, cells in the preserved tissues of some fossils can be seen to have exploded, and have a charcoal-like appearance. Bone surfaces often show a kind of cracking usually seen only when an animal is exposed to intense heat. The fish fossils don't appear to show any heat-related damage, however, so the evidence suggests that the land animals were killed by a hot cloud of volcanic ash that also swept them into the lake. The heat damage to the fossils wasn't as intense as it was to the humans who died in the 79 CE destruction of Pompeii where the heat from the ash cloud has been estimated at around 750o F. By comparison, the Cretaceous ash cloud that killed the fossil animals in China has been estimated at “only” 400 to 575°F.

## PGS PROFESSIONAL MEMBER FEATURE

A new feature this year will be highlighting one of our professional members each month. Our professional member volunteer is Nicholas Darrow. Look for the same treatment for additional members in the coming months.

### 1. Name/certifications:

Dan A. Billman, PG, CPG

### 2. Company, title or role, years with company:

Billman Geologic Consultants, Inc., President, geologist, janitor, accounts manager, etc., etc. Billman Geologic celebrated its 20th year of practice in 2013.



- 3. How long have you been a member of PGS?**  
Probably close to 25 years.
- 4. Have you held any officer positions (can you remember when)?**  
I hold a "pseudo" PGS position. I am one of two AAPG Delegates that represent PGS within the American Association of Petroleum Geologists. Andrea Reynolds of Shell is the other. So, we have an advisor role to PGS and AAPG.
- 5. Education:**  
B.S. in Geology from the University of Toledo (Ohio) and a M.S. in Geology from West Virginia University.
- 6. What are some of your day to day responsibilities in your current role?**  
Most of my consulting practice is oil and gas exploration and production related. There really isn't a "day to day" set of responsibilities. One day I am making cross-sections or mapping. Another day I am doing economic evaluations of properties. The third day I am marketing the business. Every day is different.
- 7. What is the best and worst thing about your current job?**  
Again, every day is different, every project is different. So, even the worst projects are temporary. Having said that, the marketing and accounting days are certainly less fun ... but necessary.
- 8. What was your first geology job out of college or weirdest geology job and did you learn anything you would like to pass on?**  
My first geology job, out of college, was at Mark Resources Corporation. Mark Resources doesn't exist anymore, but it was a great experience for me. Bill Zagorski was my first boss ... yes, my first boss was the "Father of the Marcellus". I learned a lot from Bill as well as many other great geologists and oil & gas professionals at Mark. Greg Wrightstone, Dave Bajek, Steve Rupert, Matt Vavro, Bob Eckle, and Ken Kirk. All were very helpful in my earliest days as a petroleum geologist.
- 9. What is your dream geology job?**  
I think I have it. I get to see a lot of different geology and don't have to live a "corporate lifestyle".
- 10. What is your favorite PA geology site/fun fact/phenomenon, etc.?**  
My favorite "PA Geology site" is every well site I've ever been on. It is very cool and humbling to be logging well cuttings or even reviewing the electric logs as they are being run and realize that you are the first human to ever look at that rock (or an image of a rock in the case of electric logs). It's even better when you were able to correctly predict what was down there, at 5,000+ feet below the surface.
- 11. What is one class you wish you would have taken in college (doesn't have to be a geology class) ?**  
I took a basic economics class, but wish I had taken a few more. Being a natural resources geologist, we typically are fairly good at the geology side of the equation, not always so good on the economics side of the equation.
- 12. What is the most exciting place you have been geologically?**  
Alaska. To see calving of a glacier, live, is very exciting. So much geology to see in Alaska.
- 13. What is your favorite or least favorite "Bad" geology movie and why?**  
Armageddon. The meteor was supposedly the size of Texas. They were going to land, drill a few hundred feet and detonate a nuclear device. Great ... now you have a meteor the size of Texas with an exploded "pimple" on it. But the meteor is still on the way ....
- 14. What's your favorite rock, mineral, or fossil?**  
Petrified Wood. Not sure why. I've always found it beautiful and fascinating.
- 15. What's the #1 most played song on your iPod?**  
Don't have a #1 song. Although lately the top bands listened to are The Clash, Violent Femmes, REM and The Cure. I'm stuck in the 80's ... but not the place in the 80's that most folks expect me to be stuck in.
- 16. What is one of your favorite quotes?**  
"If you choose not to decide, you still have made a choice." From "Freewill", Sung by Geddy Lee, Written by Neil Peart of Rush

**17. If you could choose anyone, who would you pick as your mentor?**

I've always felt good with my choice of mentors. Wouldn't change a thing.

**18. If you could meet any geologist, living or dead, who would you meet?**

Although he is not a geologist, I would have liked to have met George Mitchell. He's often credited with advancing the technology that has led to the "modern" shale plays. Mr. Mitchell just recently passed away, so I guess we'll need to go with the "supernatural meeting."

**DID YOU KNOW . . . ?**

- A new mineral called qingsongite (pronounced CHING-sohng-ite), composed of cubic boron nitride, was found in the southern Tibetan mountains of China in 2009 and has been recognized by the International Mineralogical Association. The atomic structure of qingsongite resembles the carbon bonds in diamond, so it has high density and might be as hard as diamond.
- Researchers at the USGS have produced the first complete global geologic map of Ganymede, Jupiter's largest moon.
- Scientists from the National Snow and Ice Data Center recently recorded the lowest temperatures on Earth, between -134 and -137°F in a 1,000-kilometer long swath on the highest section of the East Antarctic ice divide, a desolate and remote ice plateau in Antarctica; the previous record was -128.6°F set in 1983.
- The next time you want to throw out some outdated clothing, consider this: 75% of the cotton harvested globally grows on land that has to be irrigated, and it can take more than 5,200 gallons of water to produce the 2.2 pounds of cotton needed to manufacture a new pair of jeans and a T-shirt.
- Researchers from Brown University and the University of Hawaii have found some mineralogical surprises in the Moon's largest impact crater. Data from the Moon Mineralogy Mapper that flew aboard the Chandrayaan-1 lunar orbiter suggests that the Aitken basin, a giant 4,000 Ma South Polar crater, may contain a diverse mineralogy in the subsurface. If these data are correct, the basin

could provide much information about the Moon's interior and the evolution of its crust and mantle.

- Rivers and streams release five times more CO<sub>2</sub> into the Earth's atmosphere than all the world's lakes and reservoirs combined.
- A team from Stanford University has proposed to use a California magnesite mine for carbon sequestration, since one million metric tons of magnesite is the equivalent of sequestering 140,000 metric tons of carbon in mineral form.
- "Frac sand", the sand used in to prop open fractures induced by the hydraulic fracturing process, has to be high-purity quartz sand with high durability and very round grains.
- The bones of a new species of early Tertiary bird discovered in Canterbury, New Zealand reveal the nature of one of the world's oldest flying seabirds. Although it was found near fossils of the oldest penguin, it lacks key morphological features of penguins. Named *Australornis lovei*, the new fossil supports the emerging view that most modern birds were already diversified in the earliest Paleogene.
- Trolls throwing rocks at each other didn't form the large basalt pillars found in the Skaelingar Valley in Iceland after all; instead, they were formed by an unusual interaction of lava and water that occurred on land.
- Earthquakes can "cook" dead plants and algae trapped in a fault, similar to how organic material becomes oil and natural gas.
- The White Nile Valley in Africa was not just a lot wetter in the past, just before the start of the most recent glacial period – it was home to one of the largest freshwater lakes in the world, rivaling North America's Great Lakes.

**PGS Website of the Month**

<http://www.nrcan.gc.ca/earth-sciences>

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season.

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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#### PGS Board-of-Directors

**President:** Albert Kollar  
**Vice President:** Kyle Frederick  
**Treasurer:** Steve McGuire  
**Secretary:** Judy Neelan  
**Past President:** Mary Ann Gross  
**Other PGS Positions**  
**Webmaster:** Mary McGuire

**Director-at Large:** Tamra Schiappa  
**Director-at Large:** Robert Botterman  
**Director-at Large:** Ray Follador  
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**Newsletter Editor:** Robert Botterman

**Director-at Large:** Bill Adams  
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**Counselor:** John Harper  
**Counselor:** Mary Robison  
**AAPG Delegate:** Andrea Reynolds  
**Historian:** Judy Neelan

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412.622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724 938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412 809-6723 (cell), or [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 464-0525, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).  
Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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## **PGS THANKS OUR CORPORATE SPONSORS**

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	<b>Rosebud Mining Co.</b>
	<b>THG Geophysics, Ltd.</b>

# **ANNOUNCEMENT**

## **Pittsburgh Geological Society Spring 2014 Student Field Workshop**

**Saturday April 5, 2014  
California University  
California, Pennsylvania  
Start: 9 AM      Finish: Late Afternoon**

**Early Registration: \$20.00  
Registration day of Workshop: \$25.00**

**: Frank Benacquista, PG at: [fbenacquista@kuresources.com](mailto:fbenacquista@kuresources.com)**

**The Pittsburgh Geological Society once again invites students of geology to attend the 10th installment of the  
“Student Field Workshop.”**

### **PLEASE CONTACT US TO SAVE YOUR PLACE**

**Send payments to hold spot on registration list:**

- **At February/March PGS Meeting**
- **Send to Frank Benacquista:**

**c/o KU Resources/22 S. Linden Street/Duquesne/PA/15110**

**Cash or checks (payable to “Pittsburgh Geological Society”)**

**Have you wondered what you might be doing on that first job? Chances are you’ll be on a drill rig. You will have the opportunity to work along side an experienced drilling contractor and field-wise professionals. The Workshop will be supervised by professionals in the industry, so not only is this an excellent learning opportunity, it is your chance to ask all those questions regarding life after college. So brush up on those networking skills.**

**What will you experience?**

- **Soil sampling using a drill rig**
- **Soil & Rock descriptions**
- **Basic sampling techniques**
- **Well installation basics**
- **Basic monitoring equipment**
- **Designing a drilling program**

**As always, we will throw in lunch.**

**As all field work, this will be a RAIN or SHINE event. So watch the weather forecast carefully and prepare yourself. The drilling process can be dusty, wet, and muddy -- so leave the designer jeans and flip-flops behind.**

**We do ask that you be an active student – please no corporate trainees.**

**\*\*\*BONUS INFORMAL WORKSHOP: Friday April 4th\*\*\***

**In order to save some time and accommodate everyone for the formal Saturday Workshop we will  
start drilling on Friday**

**9 AM to 3 PM**

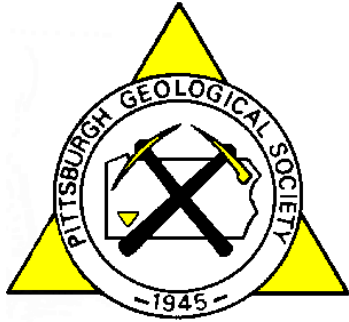
**Whenever you have the chance stop by and watch**

**SAI FARM MASTER PLAN**  
4/26/2011

Element	Count
1 Multi-Use Fields	6
2 Family & Resident Alumni Housing	42
3 Academic Field Station	New Bldg
4 Disc Golf Course	18 holes
5 Fintch and Purr Golf Course	8 holes
6 Amphitheater	yes
7 Pavilions	2
8 High and Low Ropes Course	yes
9 Parking Area(s)	22, 41, 30, 66
10 Greenhouse / Use Field (greenhall)	no / softball
11 Skate Park	skatepark
12 Challenge Course	yes
13 Baseball / Softball	1 bb, 2 sb
14 Gradnas	2 acres +/-
15 Greenhouse	yes
16 Amphity Range	yes
17 Cross Country Track	yes

**FIELD SHOP LOCATION**





# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 8

Robert Botterman, Editor

April, 2014



Wednesday, April 23, 2014

Joint meeting with the Pittsburgh Geological Society,  
the Association of Engineering Geologists,  
and the American Society of Civil Engineers  
present the

## 12<sup>th</sup> ANNUAL STUDENT NIGHT

Oral Presentation Sponsored by Pittsburgh Geological Society

### Conodont Coloration to Determine Thermal Maturation of Late Pennsylvanian Limestone Formations of Western Pennsylvania

*Christy L. Miller and Tamra A. Schiappa, Department of Geography, Geology and the Environment,  
Slippery Rock University of Pennsylvania*

The thermal maturity of the Late Pennsylvanian limestone formations of western Pennsylvania were determined by applying the conodont alteration index (CAI). The Pennsylvanian period ranges from 320-290 mya and during this time sea level fluctuated resulting in the deposition of extensive carbonate units; the Vanport, Brush Creek, Pine Creek and Ames Limestones. These formations are important proxies for not only past climate changes but are important oil and gas potential resources. One method used to determine thermal cutoffs for oil, condensate and dry gas generation in sedimentary rock units is the conodont coloration. The CAI is based on color changes in the organic matter present in the fossil teeth of these small chordates commonly preserved in Paleozoic limestones. The CAI is time and temperature dependent making it a good correlation tool for determining maximum burial temperatures. The CAI is determined by comparing samples against a set of laboratory produced conodont color standards with colors ranging from pale yellow to black and identified with numbers from 1-5 to estimate burial temperature ranges. The results of this study indicate that the Brush Creek and Vanport limestones have a CAI of one indicating a burial temperature range <math>50^{\circ}</math>-80°. The Pine Creek and Ames limestones have a slightly higher index number of 1.5 indicating a temperature range of 50°-90°. This data indicates that the Brush Creek and Vanport limestones do not reach the thermal cutoff and the Pine Creek and Ames limestones are at the minimum thermal cutoff for possible oil and condensate production.

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Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner costs \$25.00/person, students \$5.00; checks preferred. Reservations should be emailed to Steve McGuire at; [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com), please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell), Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, March 17.** Meeting will be held at Foster's Restaurant, Foster Plaza Bldg 10, Green Tree.

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**Oral Presentation Sponsored by the Association of Engineering Geologists**

**Landslide Susceptibility Assessment Using GIS in Allegheny County, Pennsylvania**

*Clarissa L. Enslin, Dr. Kyle C. Fredrick, and Dr. Thomas R. Mueller,  
Department of Earth Sciences, California University of Pennsylvania*

The landscape of southwestern Pennsylvania exemplifies the interplay of surficial processes and underlying geologic structures. Deeply incised stream valleys are prevalent throughout much of the region and are usually controlled by structurally derived fracture lineaments in the sedimentary bedrock. Due to the deep, steep-walled nature of many of these valleys, the historical land use and development in the region, slope failure is a relatively common occurrence. These mass-wasting events can range from small slumps on the order of a few cubic meters to large landslides up to thousands of cubic meters. One area that is particularly prone to these events is Allegheny County. With the city of Pittsburgh at its center, development in the county is pervasive and continues today. The purpose of this study is to assess landslide susceptibility using a weighted overlay analysis method in GIS for Allegheny County, Pennsylvania. Nine controlling factors of landslide occurrence are considered in the construction of an indexing model. The factors include: slope, aspect, lithology, land use, soil texture, precipitation, distance from streams, distance from roads, and distance from known faults. Parameters are weighted according to an impact score assigned to each parameter based on its perceived significance for landslide occurrence. Due to subjectivity in weighting the parameters, a model calibration strategy is used to match existing landslide data to predicted high-susceptibility areas. An iterative procedure to compare landslide frequency measures with high susceptibility areas produces an error map, whereby a measure of difference indicates poor model performance. Parameter weights are manipulated to optimize the indexing model and reduce these differences. Completion of the landslide susceptibility map within the GIS framework allows for updates to current data and improvement to the model as conditions within the county change. Additionally, the indexing model allows for up-to-date analysis of susceptibility based on land use changes, informing stakeholders and decision-makers of the implications of those changes.

**Oral Presentation Sponsored by the American Society of Civil Engineers**

**Factors Influencing the Effects of Underground Bituminous Coal Mining  
on Water Resources in Western Pennsylvania**

*Michael B. Keener, E.I.T., B.S., Civil and Environmental Engineering, University of Pittsburgh*

Coal mining in Pennsylvania has been fundamental to the commonwealth's economy for over 150 years. Since that time, over 1.2 million acres of bituminous coal have been mined using underground mining methods. Pennsylvania is also estimated to have over one million domestic water wells over its 29 million acres area. From 2003 to 2008, 2,789 water supplies were undermined with about 24.5% having reported impacts. The effects of underground coal mining on the utility of these wells and other water resources have only been studied systematically within the past 20 years and are still not completely understood.

Pennsylvania amended its Bituminous Mine Subsidence and Land Conservation Act (Act 54) in 1994. The amended act requires that a report be submitted every five years that assesses the impacts on water resources and structures due to underground coal mining. Well and spring effects can be classified into two categories: water loss (diminution or total loss of water) and water contamination (reduced quality, increased metals, gas, etc.). Once these types of problems are identified, they are analyzed to determine the relationship between underground coal mining and water resource quality and quantity.

This study investigates the factors associated with water loss and water contamination due to underground coal mining. The study area includes all underground bituminous coal mining activity in Pennsylvania from August 21, 2008 to August 20, 2013. The area encompasses 10 counties in western Pennsylvania providing a diverse sample of water resource data, mining methods, and local conditions. Mining activity was conducted by 6 companies with a total of 6 longwall mines and 40 room-and-pillar mines. Factors include mining method, mining depth, proximity to mining, hydrogeological setting, topographical setting, climate, and more. A statistical analysis of these factors is used to determine the most important factors driving water resource impacts. Greater study is then conducted on the most significant factors using geographic information systems (GIS) and modeling software to better understand how problems are caused and how they can be mitigated or eliminated.

## POSTER PRESENTATIONS:

Sponsored by Pittsburgh Geological Society

### **Morphometric Analysis for Characterizing Submarine Drainage Networks: East Scotian Slope Canyon System, Offshore Nova Scotia**

*James "Sage" Wagner and Katie Farnsworth, Indiana University of Pennsylvania*

Modern, clastic deepwater systems in low latitudes have been extensively studied based on their hydrocarbon potential, but less is known about proglacially influenced deepwater environments. This project will focus on detecting relevant morphological changes along the East Scotian Canyon System (ESCS), offshore Nova Scotia. Submarine drainage networks were extracted from a multi-beam bathymetry dataset of 25-meter grid size and were analyzed in ArcGIS to provide a morphometric methodology to characterize submarine drainage networks at fine resolution scales.

Following the Horton-Strahler method, main morphometric parameters (number of streams, streams length, and axial slope gradient) were calculated for each stream segment. Quantitative analyses used for terrestrial fluvial drainage networks such as drainage area, drainage density, stream frequency, basin relief and accumulated stream length parameters were conducted to characterize the system. This work has the potential to expand existing models for deepwater processes and resulting submarine drainage networks to high-latitude margins influenced by proglacial sedimentary processes.

### **Inorganic Ions Contributing to Elevated Conductivity in Oregon Hollow Wetland: Washington County, Pennsylvania**

*Nicholas Patton and Kyle C. Fredrick, California University of Pennsylvania*

Oregon Hollow is a 2.7 mile long, first-order tributary that enters Gorby Run before it ultimately feeds Pike Run, located in southwestern Pennsylvania. It is of particular interest in terms of chemical contamination as it is bordered by abandoned coal mines, Interstate 43 and local farms. A study was done by students, at California University of Pennsylvania in conjunction with the Washington Watershed Alliance on Pike Run and its tributaries, to monitor water quality indicators in 2012. Oregon Hollow was found to have an abnormally high conductivity of 1100  $\mu\text{S}/\text{cm}$  which could have adverse effects on the local streams continuing downstream. In the headlands of the tributary, a small wetland is situated among seeps, mine-slag fill and a road salt repository, conductivity measurements were even higher at 2800  $\mu\text{S}/\text{cm}$ . The

purpose of this study was to identify the possible contributors to the elevated conductivity in the surface and ground water of Oregon Hollow Wetland. A comprehensive water sampling procedure was performed to collect three above and four below surface samples at predetermined depths and distances. Samples administer through a variety of analytical methods such as: inductively coupled plasma spectrometry, ion selective electrodes and multi-probes. Methods were utilized to determine eleven inorganic ions average concentrations and pH: nitrate (8.66ppm), arsenic (ND), iron (0.234ppm), sodium (266ppm), calcium (233ppm), chloride (298ppm), lead (ND), phosphate (0.0800ppm), nickel (0.00815ppm), cadmium (ND), mercury (ND) and pH (8.43). The primary constituents of elevated conductivity are believed to caused by the upstream salt repository and the local Fishpot and Sewickley limestone; however, more investigation is needed.

Sponsored by the Association of Engineering Geologists

### **Evaluating the Variability of Discontinuity Orientation Data for Slope Stability Purposes**

*Chelsea E. Windus, Department of Geology, Kent State University*

In any geologic site assessment there are problems associated with variability in measured orientation of discontinuities (joints, bedding, faults, etc.). Variability refers to how spread out or clustered collected data is. Geologic and human factors contribute to variability in any site assessment. The geologic factors include the degree of development of discontinuities (well developed versus randomly developed discontinuities), and lithologic variation within the site. Objectives of this study included evaluating factors that lead to variability, attempting to quantify variability of discontinuity orientation data, evaluating effects of variability on kinematic analysis for slope stability purposes, and determining the optimum number of discontinuity measurements needed to accurately take into account variability. In order to achieve the objectives, 500 discontinuities were measured at each of two selected sites. DIPS software was used to plot orientation data on stereo nets and determine the principal discontinuities. Site 1, located along State Route 4 in Clark County, Ohio, is comprised of a Silurian Limestone, and represents well developed discontinuities. Three main discontinuities were identified including bedding and two perpendicular joint sets, with average attitudes of 076, 5SE; 014, 87NW; and 270, 80N, respectively. The data does not show much variability when 100 to 150 discontinuities are plotted, suggesting that the optimum



number of measurements needed for a site with well-developed discontinuities is 150. Site 2, located along State Route 2 in Brooke County, West Virginia, is comprised of interbedded Pennsylvanian sandstones and shales, and represents randomly oriented discontinuities. A total of 4 discontinuities were identified at this site with average attitudes of 143, 2SW (bedding); 070, 77NW; 089,88NW; and 335 72NE. These attitudes were highly variable when plotting 50 to 300 discontinuities. Plotting more than 300 discontinuities resulted in fairly consistent attitudes, suggesting 350 as the optimum number of measurements needed for sites with randomly developed discontinuities.

### **A Paleoseismicity Record for Cariaco Basin, Caribbean Sea: An Analysis of Turbidites in Sediment Cores**

*Geoffrey Dipre, Ohio State University*

Turbidites have been identified as paleo-earthquake proxies in many marine and lacustrine settings. When present in the sediment record, turbidites provide the potential to reconstruct paleoseismicity history for tectonically active regions. Earthquakes have been cited as a primary mechanism for producing turbidity flows in Cariaco Basin off the coast of Venezuela (Thunell *et al.*, 1999). Two turbidites in box core PL07-81 BC have been correlated with the historically-recorded 1929 and 1900 earthquakes (Hughen *et al.*, 1996). This study identifies turbidites found in several box cores taken from two sub-basins in the Cariaco Basin. I present evidence that the production of turbidites here is a basin-wide phenomenon. X-ray fluorescence data, along with observable physical characteristics, suggest that tectonic activity along the El Pilar and the Morón fault zones are responsible for producing the turbidites found in the Cariaco box cores. Finally, I tentatively calculate an age model and recurrence interval for the turbidites found in box core PL07-11 BC. Consistency between our calculated recurrence interval and the reported data for significant tectonic activity along the El Pilar fault zone suggests that the turbidites found in Cariaco Basin are earthquake-induced.

**Sponsored by American Society of Civil Engineers**

### **Models of Hypothetical Stream Contamination from Hydraulic Fracturing of the Marcellus Shale in Indiana County, Pennsylvania**

*Dennis J. Carpinello, Department of Geosciences, Indiana University of Pennsylvania*

Hydraulic fracturing, when combined with horizontal drilling, has made extraction of the natural gas reserves found in the Marcellus Shale much more feasible. A byproduct of this method is flowback in the form of brine, which has extremely high salinity and contains high concentrations of various elements, including radium. Proper disposal of brine has been a focus of public attention, considering that, in 2010, 55% of wells were located within 300 meters of streams. While public concerns may be reasonable, we argue that anything other than catastrophic displacement of flowback fluids into streams would result in minimal impact on their overall drinking water quality.

We set out to determine if the concentrations of specific contaminants, Total Dissolved Solids (TDS), sulfate, barium, and total radium found in brine extracted from a Marcellus gas well in Indiana County, Pennsylvania would exceed Pennsylvania Maximum Contaminant Levels (MCL's) for drinking water if introduced into streams of various discharges. Although we modeled different stream discharges, we used data from Blacklick Creek for present stream levels of each contaminant. To model the amount of brine introduced into the streams, we used a range of 5,500 cubic feet (storage tank) to approximately 30,000 cubic feet (three impoundment ponds) for the brine that would be displaced. In our models, the rate of flow of brine varied from one minute (catastrophic displacement) to one year (low-level long-term discharge). The amount of time required for contamination to exceed MCL's ranged between 1 hour and 1 day and was never more than 1.5 days even in the most extreme cases. This suggests that long-term low-level discharge of flowback water would rarely pose a problem for stream health and that only catastrophic displacement events similar to the recent tank spill in West Virginia would result in stream pollution.



**Specimen of *Annularia stellata* Schlotheim, the leaves of *Calamites*, a fossil scouring rush from the Pennsylvanian Period.**

## Potential causes for along-strike variability of slow slip events in south-central Alaska

W. David Watkins<sup>1</sup>, Harmony V. Colella<sup>2</sup>, Michael R. Brudzinski<sup>2</sup>, James H. Dieterich<sup>3</sup>, Keith B. Richards-Dinger<sup>3</sup>

<sup>1</sup>Department of Geoscience, Indiana University of Pennsylvania, Indiana, Pennsylvania

<sup>2</sup>Department of Geology, Miami University of Ohio, Oxford, Ohio

<sup>3</sup>Department of Earth Sciences, University of California-Riverside, Riverside, California

Slow slip events (SSEs) are observed in subduction zones around the world and exhibit a wide range of recurrence intervals, durations, and spatial extents. A ubiquitous feature of SSEs is the along-strike variability of these characteristics. However the cause and long-term effects of such variability is poorly understood. Additionally, it is unclear whether such variability and segmentation of SSEs persists beyond human time scales. Here we employ the earthquake simulator RSQSim to model a megathrust, which consists of seismogenic, slow slip, and continuous creep sections. The slow slip section is segmented to explore potential causes of along-strike variability in recurrence intervals, durations, and spatial extent, by varying parameters such as the effective normal stress, frictional properties, and slip rates. RSQSim enables simulations of long histories of SSEs over all orders of magnitude, which allows for robust characterization of the effects of variation in parameters. Preliminary results show even small variations in these parameters have a significant effect on observable characteristics of SSEs, which begins to illuminate the primary controls on along-strike variability. For example, a decrease in the effective normal stress from 9MPa to 3MPa results in a decrease in the mean recurrence interval and event duration from 35 to 15 months and 44 to 16 days, respectively, but increases the mean propagation speed from ~7 km/day to ~24 km/day. This research builds on the previous study and considers variations in fault geometry (i.e. tears in the fault) and fault roughness in addition to the parameters discussed above. Ultimately this work aims to reproduce observed SSEs in south-central Alaska.

**Each Society has agreed to award the oral speaker a \$100 prize and each poster presenter will receive \$50 from the associated society.**

## NOMINATIONS & ELECTIONS – Last Call

This being the month of April, the time is fast approaching to consider becoming more involved in

the Pittsburgh Geological Society (Society). We will be closing nominations for our May election ballot at the April 23rd meeting. We continue to ask our non-student membership to consider being nominees for Board positions. If anyone has an interest in being Treasurer we are looking to fill this officer position (any questions can be directed to current Treasurer Steve McGuire about the duties at [smcguire@chesterengineers.com](mailto:smcguire@chesterengineers.com)).

If you have no previous experience in participating in the governing a professional society then you may want to consider becoming one of the 3 Director at Large positions that are filled every year by the Society. In this position you will assist the officers and committee chairs in the monthly functions of the Society. It is a great way to contribute to your Society while getting acclimated in its function. Membership on the Board does groom our future officers. The Director at Large position is a 2 year commitment and requires regular attendance at the Board meetings held 1 hour prior to the social hour of each monthly meeting.

If you are a past officer/board member I want you to know you are always welcomed back. Previous experience is very useful at our Board meetings whether you want to come back as an officer or take the gradual approach as a board member.

If you are an active member of the Society and have an interest in being a candidate please contact **Ray Follador**, Nominations and Elections Committee Chair, ASAP at [geodawg@comcast.net](mailto:geodawg@comcast.net) or (724) 744-0399. A list of all candidates will be announced at the April meeting with the election to be held at the May meeting.

## ORIGINS OF WESTERN PA PLACE NAMES

Berlin is a borough in Somerset County. Settled by German immigrants, probably sometime before the Revolutionary War, Berlin was named for Prussia's (now Germany's) capital city. The town was laid out in 1784 and incorporated in 1833. The town is most famous for Snyder of Berlin potato chips and snacks, but it is also home to Center Rock, Inc., a drilling-equipment manufacturer, and the Berlin Fife and Drum Corps, one of the oldest fife and drum corps in North America. Berlin lends its name to a structural feature called the Berlin syncline, an asymmetrical fold that trends northeast-southwest from Deep Creek, Maryland, to just southeast of Johnstown between the Negro Mountain and Deer Park anticlines. Coal mines in the Pittsburgh coal seam in Somerset County are mostly confined to areas along the Berlin syncline.

## DID YOU KNOW . . . ?

- Researchers using a new, cutting-edge isotopic tool, have reconstructed the temperature history of the region near Indonesia. Their findings? The region has warmed considerably over the last 20,000 years, since the last ice age. A brilliant example of how to use technology to discover the obvious!
- Most of the sediment that makes up the Alberta tar sands contains zircons that have been dated to between 300 and 1,200 Ma, which is the zircon signature found in source rocks in the Appalachians.
- Sea-floor hydrothermal vents can act as a form of “fuel cell” because redox reactions between minerals released by hydrothermal vents and oxygen in seawater can generate electrical energy. In a deep-sea experiment in Okinawa recently, Japanese researchers demonstrated that electrical power can be harnessed from these vents.
- Researchers at UCLA used seismic tomography to determine the thickness of the Pacific plate increases as rock from the mantle cools, the rock chemistry changes with depth, and the mechanical behavior of the rocks change with depth and their proximity to where the plate is being formed at the mid-ocean ridge.
- About 800 Ma, some forms of cyanobacteria (“blue-green algae”) were able to transform atmospheric nitrogen into soluble nitrogen throughout the open ocean. This “fertilizer” allowed oxygenating cyanobacteria to colonize the ocean and produce enough oxygen and carbohydrates to facilitate the “great leap forward” toward more complex life forms.
- Norwegian scientists believe the Mojave Crater, a 34-mile-wide crater on Mars, is the source of shergottites, a type of meteorite widely found on Earth.
- Following the explosion of one of Chevron Appalachia LLC’s Marcellus wells in Greene County, PA, in February, 2014, the company temporarily ceased operations at seven wells across the state because of concerns about wellhead configurations and their ability to handle high pressures.
- Although best known as a problem in metals, fatigue occurs in other materials as well, including rocks. It has been suggested that fatigue processes might be important in the generation of rockfalls on coastal cliffs as a result of repeated wave impacts on the cliff toe regenerating a cyclic load on the cliff itself.
- An assessment of undiscovered copper resources by the USGS estimates that 3.5 billion metric tons

of copper may exist worldwide, with South America having the dominant amount of both identified and undiscovered resources. Several regions of Asia, including China, also have potential for large undiscovered copper resources.

- The thermal histories of rock samples from the bases of different parts of the Grand Canyon and the adjacent canyon rims have given geologists a better way to determine how long ago the ancestral Colorado River carved the canyon; the results: the Hurricane segment and the Eastern Grand Canyon formed 70 to 50 Ma and 25 to 15 Ma, respectively, while Marble Canyon to the east and the Westernmost Grand Canyon formed 5 to 6 Ma.
- The oldest known rock on Earth is 4,374 Ma, as confirmed by a zircon crystal from Jack Hills, Australia. This tiny mineral indicates that the time occurring between the formation of the Moon by collision of the Earth with a Mars-sized asteroid and the cooling and creation of Earth’s first solid crust was only 100 Ma.
- Geologists have found evidence of extinct supervolcanoes near the Utah-Nevada border that, around 30 Ma, ejected more than 1,320 miles<sup>3</sup> of magma during a one-week period. Lava deposits from this single eruption are 2.5 miles thick.
- The USGS reports that a November 2011 magnitude 5.0 earthquake in Oklahoma associated with wastewater injection might have triggered a magnitude 5.7 earthquake less than a day later.
- Geologists have discovered evidence that supports historical narratives of two earthquakes that occurred in San Francisco 68 years before the 1906 disaster.
- Paleontologists have discovered the remains of a dwarf tyrannosaur along an Alaskan river above the Arctic Circle. Named *Nanuqsaurus* from Inupiat word “nanuq”, meaning polar bear, the new dinosaur shows that relatives of *Tyrannosaurus rex* survived and even thrived in extreme polar environments, some 70 million years ago.

### PGS Website of the Month

<http://webmineral.com/>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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**PGS Board-of-Directors**

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<b>Vice President:</b>	Kyle Frederick	<b>Director-at Large:</b>	Robert Botterman	<b>Counselor:</b>	Charles Shultz
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<b>Past President:</b>	Mary Ann Gross	<b>Director-at Large:</b>	Ken LaSota		
<b>Other PGS Positions</b>		<b>AAPG Delegate:</b>	Dan Billman	<b>AAPG Delegate:</b>	Andrea Reynolds
<b>Webmaster:</b>	Mary McGuire	<b>Newsletter Editor:</b>	Robert Botterman	<b>Historian:</b>	Judy Neelan

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**Officer Contacts:** If you wish to contact a current PGS Officer, please call or email Albert Kollar, President, at 412.622.5513 / [KollarA@CarnegieMNH.org](mailto:KollarA@CarnegieMNH.org); Kyle Fredrick, Vice President, at 724 938-4463 / [fredrick@calu.edu](mailto:fredrick@calu.edu); Steve McGuire, Treasurer, at 412 809-6723 (cell), or [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com); Judy Neelan, Secretary, at [jneelan@verizon.net](mailto:jneelan@verizon.net).

**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 464-0525, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).  
Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

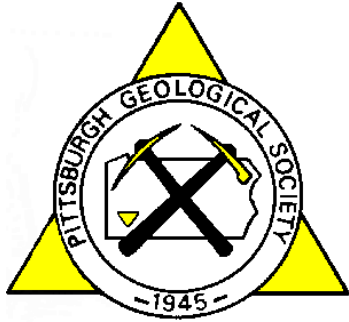
**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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## PGS THANKS OUR CORPORATE SPONSORS

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# PGS Newsletter

<http://www.pittsburghgeologicalsociety.org/>

Vol. LXVI, No. 9

Robert Botterman, Editor

May, 2014



Wednesday, May 21, 2014

The Pittsburgh Geological Society

***EVALUATION OF GEOMORPHIC FORCING BY THE  
MEDIÉVAL CLIMATE ANOMALY UPON PEDIMENTS  
ACROSS THE WHITE RIVER BADLANDS, SOUTH  
DAKOTA***

**Patrick Burkhart, Geography, Geology, & Environment, and  
Katherine Mickle, Art, Slippery Rock University of Pennsylvania**

Sod tables throughout the White River Badlands are vestigial remnants of pediments, which have been subsequently dissected by streams. The pediments formed as detritus from the eroding highlands washed and tumbled upon the bedrock remnants, forming a sloping apron along the base of cliffs. As a result, sod tables have planar, gently dipping, turf covered surfaces that stand a part to many meters above the surrounding washes, with their greenery contrasting vividly against surrounding bedrock. The stratigraphy of colluvial/alluvial silts within the sod tables often contains one to six paleosols. The Badlands Working Group at SRU has studied these exposures at localities on the upper prairie, Badlands National Park. Radiocarbon ages of the paleosols reveal that intervals of soil formation occurred at approximately ca. 3600, 2400, 1800, 1200, and 900 RCYBP, several of which have also been reported by other investigators for ages of paleosols within proximal eolian deposits.

We take the uppermost paleosol (youngest age) to be the oldest date for the onset of incision that dissected the pediments into sod tables. This constraint exists because for a soil on a pediment to become a paleosol by burial under subsequent alluvium, the pediment surface must remain connected to the bluff. The incision that forms a sod table separates the sod table from the retreating cliff, precluding further alluvial burial of its surface. The timing of this incision is provocative. In addition to disclosing rapid vertical incision of 2-4 cm and lateral retreat of 1-2 cm annually, we now suspect that the causality of incision is the Medieval Climate Anomaly (MCA). A growing body of literature is linking various proxy records, including dune activation and lake sediments within the Great Plains, to the MCA. In 2013 we completed a preliminary transect across the exposure area of the White River Group on the Great Plains, indicating that the timing of incision is consistent throughout the region. Recently, we have proposed additional investigation of proximal dune fields to search for synchronous geomorphic perturbation.

Pedagogically, our students report that their participation is a pivotal experience that transforms their undergraduate experience. Over 100 undergraduate students have contributed to this investigation during fifteen years. Peer mentoring, whereby veterans coach novices, has helped students maximize the value of their first field expedition. Another attractive aspect of our studies is that we routinely mix students of both art and science. Each group has shared meaningfully with the other, to the benefit of all. The harshly compelling landscape coerces curiosity and exploration. With over 1,000 field-days logged by students, many a powerful lesson has been learned. Please enjoy the installation of Badlands art during the social hour prior to the evening colloquium!

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**Social hour - 6:00 p.m.**

**Dinner - 7:00 p.m.**

**Program - 8:00 p.m.**

Dinner costs **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at; [pgsreservations@gmail.com](mailto:pgsreservations@gmail.com)**, please title the e-mail as "PGS Dinner Reservation" or call (412) 809-6723(cell). Reservations can also be made using PayPal at our website <http://pittsburghgeologicalsociety.org> and leave your name and number of reservations needed by **noon, Monday, March 17**. Meeting will be held at **Foster's Restaurant, Foster Plaza Bldg 10, Green Tree**.

**Dr Patrick Burkhardt** joined the faculty of Slippery Rock University in 1998, teaching Hydrology, Hydrogeology, Environmental Geology, and Glacial Geology. His professional interests lie in water resources, landscape evolution, and environmental change. He is a strong supporter of collaborative undergraduate research, as both an advocate for systemic enhancement and as a respected practitioner. His student collaborators have sought adventure-based discovery in the Badlands of South Dakota, alpine landscapes in the Andes, glaciers in Alaska, watersheds of Costa Rica, and many aspects of Pennsylvania geology. He has also worked as a consulting hydrogeologist, examining water budget analyses, contaminant transport, and aquifer remediation of petroleum hydrocarbons. His research has taken him from arctic to tropical settings in pursuit of understanding the evolution of geologic thought and the history of science, notably finding great satisfaction while trekking in the footsteps of Charles Darwin.

He completed a BA in Geology at Case Western Reserve University in Cleveland, Oh. As the study of groundwater became a pressing scientific necessity, he earned in Master of Science degree at Wright State University in Dayton, Oh. Having then developed a dream to become a professor, he completed his PhD in Geology at Lehigh University, Bethlehem, PA studying the neutralization of acid deposition in a Pocono watershed. He compliments his studies with service to the Geological Society of America and the Pittsburgh Geological Society.

**Katherine Mickle, MFA, Associate Professor of Art** Katherine Mickle teaches all levels of Photography for the Art Department at Slippery Rock University of Pennsylvania. She also currently teaches Drawing. Katherine holds memberships in multiple art organizations while serving on various departmental and university-wide committees at SRU. She exhibits regionally and nationally, and she has presented papers at the regional, national and international levels. Katherine received her terminal degree, the Master of Fine Arts in Photography from Ohio University. She earned her MA with a major in Photography and minor in Painting from Stephen F. Austin University in Nacogdoches, Texas. Katherine received her Bachelor of Fine Arts from SRU with a second major in Spanish, studying overseas for one semester at la Universidad de Sevilla, Spain.

Katherine first traveled on the Badlands Working Group research expedition in 2006 to the High Plains of the US, joining SRU faculty and students from Geology, Geography & the Environment department for two weeks. The photographic images collected on that trip will continue to further her artistic growth as well as contribute to the scholarly growth of others. Her Badlands imagery is multi-fold: drawings, paintings and photographs (35mm, medium format, 4x5" large format and digital). She has created thousands of images from the Badlands research expeditions and continues to place them on public display.

## **PGS ELECTIONS**

This year's ballot is attached at the end of this newsletter. Be sure to submit your selections if you will not be able to vote at the May meeting.

## **OSHER LIFELONG LEARNING COLLEGE**

As part of the Pittsburgh Geological Society education outreach initiatives, President Albert Kollar organized a five-week class on Geology and Energy of the Pittsburgh Region for the University of Pittsburgh spring Osher program, March 19–April 16th. Osher is part of the Lifelong Learning College at Pitt and is for adults 55 and older. The enrollment for the class was 61, the highest attended for any science type class offered this spring.

Presenters included PGS members Albert Kollar, John Harper, Dan Billman, and Ray Follador. Katie Schmid of the Pennsylvanian Geological Survey kindly stepped in at the last minute to speak to the group as well.

## **SEAWATER TO FUEL?**

The US Navy believes it has finally worked out the solution to a problem that has intrigued scientists for decades: how to take seawater and use it as fuel. The development of a liquid hydrocarbon fuel is being hailed as “a game-changer” because it would significantly shorten the supply chain, a weak link that makes our defense forces easier to attack. US experts have found out how to extract carbon dioxide and hydrogen gas from seawater. Then, using a catalytic converter, they transformed them into a fuel by a gas-to-liquids process. They hope the fuel will not only be able to power ships, but also planes. That means instead of relying on tankers, ships will be able to produce fuel at sea. Source: <http://www.defensenews.com/article/20140407/DEFRE/02/304070027>

## **ORIGINS OF WESTERN PA PLACE NAMES**

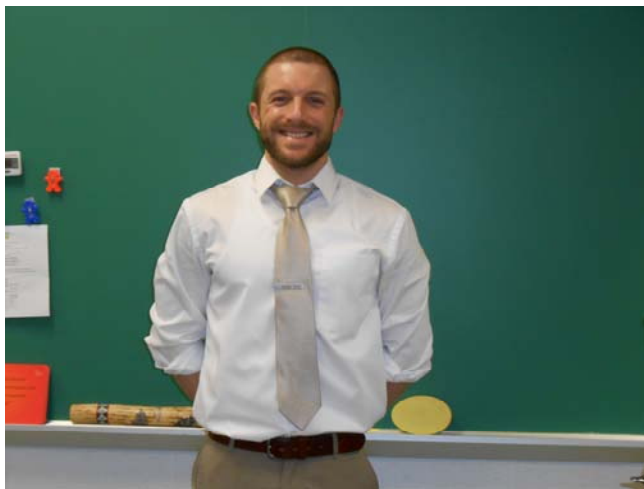
Although the first settlers of non-Native-American descent arrived in the area now known as Jefferson County in 1796, the county was not established until 1804 when it was separated from Lycoming County and named for President Thomas Jefferson. Jefferson County's primary claim to fame is as the home of Punxsutawney Phil, the famous climate-predicting groundhog. Lumbering was the primary industry early on, with millions of board-feet of lumber rafted down the Clarion River to the Allegheny and then to Pittsburgh in the 1800s. Coal mining and coke manufacturing were large industries in the county in the late 1800s and early 1900s, with beehive coke ovens being especially prominent. One town even boasted the longest string of beehive ovens in the world for a while, with more than 400 ovens stretching over a mile. Eventually, drilling for natural gas became a successful endeavor, and is still one of the main economic mineral industries in the county.

## PGS STUDENT MEMBER FEATURE

A new feature this year will be highlighting some of our student members each month. Our student member volunteers this month are Dennis Jesse Carpinello and Nick Patton.

**1. Name, email:**

Dennis Jesse Carpinello  
(jessecarpinello@gmail.com)



**2. Education (school, degree, expected graduation date):**

Indiana University of Pennsylvania, Earth and Space Science Education, Graduation: May, 2006  
Indiana University of Pennsylvania, Geology (Environmental), Expected Graduation: August, 2014

**3. Internships or previous company history:**

Have been employed as a secondary Astronomy and Math teacher at Punxsutawney Area Middle School since 2006

**4. How long have you been a member or PGS?**

Since 2013

**5. Any ideas on student related activities that you wish PGS would do?**

Job/Career Fair

**6. Are you working on any research topics, please list title, describe?**

As part of my senior research project at IUP, I've been creating models of hypothetical stream contamination from Marcellus Shale brine in Indiana County, PA.

**7. What's your favorite subject/area of study?**

Hydrogeology

**8. What are your plans following graduation? (Continuing with your education, academia, or into the job market)?**

While I love my job, I plan to continue teaching until I'm able to secure employment with an environmental consulting or engineering firm.

**9. What are your plans if money was not an issue?**

If money was not an issue, I would probably pursue an advanced degree in Environmental Engineering, Hydrogeology, or Architecture (and buy a 1964 Aston Martin DB5).

**10. What is your dream geology job?**

See above.

**11. What is your favorite PA geology site/fun fact/phenomenon, etc.?**

My family has a cabin in Potter County, and I've always enjoyed the Pennsylvania Grand Canyon. We love riding our mountain bikes on the Pine Creek Rail Trail from Ansonia to Blackwell, and taking in the views from Colton Point and the Leonard Harrison lookout.

**12. What is the most exciting place you have been geologically or one play you wish you could visit?**

One of the coolest places I've been to is Hoover Dam in Arizona. It was pretty amazing to see the drawdown in Lake Mead, and is just awesome in its size.

**13. What is your favorite or least favorite "Bad" geology movie and why?**

As a kid, I loved Dante's Peak because it's always cool to see a volcanic eruption, and was at least fairly accurate (at least in terms of Geology movies). Twister was pretty good too.

**14. What's the #1 most played song on your iPod?**

It's probably a three-way tie between "Babe, I'm Gonna Leave You" by Led Zeppelin, "Walk" by Foo Fighters, and "The Man Who Sold the World (Live Unplugged)" by Nirvana

**15. What is one of your favorite quotes (geology related or not)?**

"Never forget who you are. The rest of the world won't. Wear it like armor, and it can never be used to hurt you."

- Tyrion Lannister from "Game of Thrones"

**16. Anything else you would like to share about yourself?**

When I'm not teaching or pursuing my second degree, I'm usually on the treadmill at the gym, riding my motorcycle, or watching the Pittsburgh Pirates on ROOT.



- 1. Name, email:**  
Nick Patton, NickRPatton@gmail.com
- 2. Education (school, degree, expected graduation date):**  
Graduated from California University of PA in Fall of 2013
- 3. Internships or previous company history:**  
I have worked as an intern for Comtech Industries Inc. in 2010, participating in water treatments, assisting in radiation surveys, and aiding in safety inspections for both Chevron and Cabot Oil and Gas industries. In 2011 I interned with FCI Morgantown assisting the Safety Manager at a government facility to maintain safety code and regulation for government, OSHA, DEP, and EPA standards. Currently I work as an In-house Consultant for Hatch Mott MacDonald where I aid in mitigation and monitoring of longwall affected streams within southwestern Pennsylvania by collection of daily flows, well heads, water samples, and coordinates of heaves, fractures and discharge points.
- 4. How long have you been a member or PGS?**  
I have been a member for 4 years.
- 5. What's your favorite subject/area of study?**  
My favorite geology subjects are geochemistry and groundwater hydrology.
- 6. What are your plans following graduation? (Continuing with your education, academia, or into the job market)?**  
I will be attending Idaho State University in the Fall of 2014 studying geobiochemistry and hydrology.
- 7. What are your plans if money was not an issue?**  
If money was not an issue I would spend the rest of my life traveling and continuing my education, aka professional student.

- 8. What is your dream geology job?**  
My dream geology job would be to teach summer field geology courses or be a geology researcher.
- 9. What is the most exciting place you have been geologically or one place you wish you could visit?**  
The most exciting place I have been was on top of Angel's Landing in Zion National Park.
- 10. What's your favorite rock, mineral, or fossil?**  
Labradorite
- 11. What's the #1 most played song on your iPod?**  
"Closer" by Tegan and Sara
- 12. What is one of your favorite quotes (geology related or not)?**  
"The mountains are calling and I must go."  
- John Muir

## PGS FOUNDING MEMBER

EDMUND WATTS ARTHUR

July 15, 1874- October 8, 1948

A MAN FOR ALL SEASONS

By Tracy Ferguson

Edmund Watts Arthur was a prominent Pittsburgh attorney and devoted family man, who by avocation was a naturalist, conservationist, geologist, botanist, ornithologist, astronomer, entomologist and writer. He was a founder member of the Pittsburgh Geological Society and close friend of both Dr. O. E. Jennings, botanist, and Dr. Frank W. Preston, conservationist and ecologist.

Arthur discussed with Dr. Jennings such matters as "the saw-toothed skyline of the hills along the Allegheny River above Oakmont" and the Butler County glacial geology including the terminal moraine. Jennings stated that Arthur "was keenly interested and actively participated in efforts to preserve areas of exceptional natural features. He was active and freely lent of his legal talents in our efforts in the Cook Forest Association to preserve the primeval aspect of the forest. He was likewise active with respect to the conservation of McConnell's Mill and the 'peninsula' at Ohiopyle." He worked extensively with Dr. Preston to reclaim the land in the glacial foreland of Butler County that is now known as Moraine State Park. Preston was involved in producing a memorial film on the glacial history of the foreland as a "small tribute to one of the most lovable men we ever had among us (Edmund Arthur)." An even greater tribute was bestowed on Edmund Watts Arthur when Dr. Preston and others named the glacial lakes in the foreland, Lake Edmund, Lake Watts and Lake Arthur.



Moraine State Park's Lake Arthur was completed in 1970 by damming Muddy Creek.

Arthur would frequently write about his forays into the ravine located behind his Ben Avon home. One such article was published in 1929 in The Ben Avon Forum entitled "Some Adventures in Vinegar Hollow." He wrote, "Of course, a V-shaped ravine at one's very back door is a constant temptation, a daily invitation to stray from the domain of bricks and asphalt to the land of brook and meadow path. All brooks are 'murmuring' or 'babbling' or 'laughing' or 'gurgling' and the rivulet- for it is scarcely more- of Vinegar Hollow is no exception, unless it be that it is all of these at once." He described the "mossy spring- mossy even in winter- that bursts from the rock at the south wall near the mouth of the ravine. At the spring begins a long, grassy meadow, luxurious in summer with its ironweed, boneset, rosinweed, balsam, goldenrod and later asters." Geologically, he referred to the Ames limestone fragments from far up on the hill. "They are greenish-gray and are covered with tiny fossil shells of some ancient bivalve, crinoid stems, and an occasional gasteropod." After describing the flora and the fauna likely to be found in Vinegar Hollow in the various seasons, he concluded that "You will have to see it all for yourself. Early Sunday morning is the best time. You can easily get home for breakfast cakes and sausages and in time for Sunday School or morning service as your custom is, and the invigoration of an hour among the primitive surroundings of this, one of the most beautiful of 'God's first temples', our own Vinegar Hollow, will 'tune your heart' into harmony with the spirit of the day."

## DID YOU KNOW . . . ?

- Astronomers have discovered the oldest star ever seen in the Universe, about 6,000 light years away from Earth. Dubbed SM0313, the star, which is located in the southern constellation of Hydrus, is thought to have formed within the 2<sup>nd</sup> generation of stars, "shortly" after the first stars exploded.
- The Bakken Shale has produced 1 billion barrels of crude oil since 2000, 151 million barrels from eastern Montana and 852 million barrels from North Dakota. About 2/3 of the total production occurred in the last three years.
- Geophysicists at the University of Liverpool suggest that deep sea fault zones could transport enormous amounts of water from Earth's oceans to the upper mantle; the Japan subduction zone alone, for example, is capable of having transported up to 3.5X the water of all Earth's oceans to the mantle.
- Heat from warm river waters draining into the Arctic Ocean rapidly warms the surface layers of the ocean, thereby enhancing the melting of Arctic sea ice each summer.
- Paleontologists from the University of Toronto have found the oldest known ancestor of terrestrial herbivores in Pennsylvanian rocks in Kansas. *Eocasea martini* was, surprisingly, a carnivorous

animal that belonged to the synapsid reptiles, the group that eventually led to the mammals.

- The US Geological Survey in 2013 documented naturally occurring, potentially dangerous methane in shallow aquifers in five counties of south-central New York. Each water well sampled was at least 1 mile from any oil and gas wells and drilling activity. A research paper in the February 2014 AAPG Bulletin documented the same thing in north-central Pennsylvania.
- Scientists studying meteorite that originated on Mars as 1.3 billion year old rock have found signs indicating water once existed on our neighboring planet.
- A salt dome is a column of salt in the subsurface that has risen toward the surface because it has a density that is lower than the rock above it. The salt behaves like a stream of high-viscosity oil ascending in slow motion through a thick layer of water above.
- A cooperative international assessment of copper resources of the world indicates that in addition to identified copper resources of 2,100 million metric tons (Mt), a mean of 3,500 Mt of undiscovered copper is expected on six continents.
- The USGS estimates that the Bombay and Krishna-Godavari Provinces of India have a technically recoverable mean volume of 62 million barrels of oil in shale-oil reservoirs, and more than 3.700 trillion cubic feet of gas in tight sandstone gas reservoirs.
- A landslide occurred in Baltimore in late April when a retaining wall buckled sending cars and mud tumbling 75 feet onto CSX railroad tracks. The city got more than 3 inches of rain on that day, the fourth-wettest April day on record.
- Antarctica is the only continent without snakes or other reptiles because it's so cold. However, it does have fossils of reptiles from when the climate there was a lot warmer.
- By measuring the chemistry of Hawaiian lavas associated with 25 eruption that took place over 600 years, scientists have found that energetic eruptions and gentler "effusive" eruptions seem to have come from areas of the mantle with subtly different chemistries.

## PGS Website of the Month

<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Special thanks to all who contributed newsletter items this season.*

**News items:** To submit a news item for the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at [rbottgeo@aol.com](mailto:rbottgeo@aol.com). Be sure to also send an email address and phone number where you may be contacted.

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**Memberships:** For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, call John Harper at (412) 464-0525, or e-mail [jharper.pgs@gmail.com](mailto:jharper.pgs@gmail.com).  
Membership information may also be found at our website: [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

**Programs:** If you would like to make a presentation at a PGS meeting, please contact Kyle Frederick, Program Chair at 724. 938-4463 or email at [fredrick@calu.edu](mailto:fredrick@calu.edu).

**PGS Website:** To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email [marykmcguire@comcast.net](mailto:marykmcguire@comcast.net) or use the site's "Contact Us" link at [www.pittsburghgeologicalsociety.org](http://www.pittsburghgeologicalsociety.org).

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