

PGS Newsletter

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

Vol. LXIII, No. 1

Robert Botterman, Editor

September, 2010

Wednesday, September 15, 2010

**The Pittsburgh Geological Society and the
Pittsburgh Section of the Society of Mining Engineers present**

Assessment of Risk, Legal Issues, and Insurance for Geologic Carbon Sequestration in Pennsylvania: An Overview

by **Thomas A. Gray, P.E.**
SME Distinguished Member
Manager, Energy and Natural Resources
Tetra Tech NUS, Inc.

The Pennsylvania Department of Conservation and Natural Resources (PA DCNR) recently retained Tetra Tech to evaluate the geologic potential and risks associated with geologic sequestration in Pennsylvania. A DCNR report entitled "Geologic Carbon Sequestration Opportunities in Pennsylvania" was issued earlier in 2009. That report assessed the suitability of geologic formations for the location of a state carbon dioxide sequestration network. Tetra Tech's report extended the initial evaluation of the geologic setting with more detailed analysis of the potential for geological storage. A risk assessment was also performed to evaluate the potential human-health, safety and environmental risks associated with CCS. In addition, insurance issues associated with future statewide geologic sequestration of CO₂ in Pennsylvania were evaluated. This presentation will summarize the findings associated with these issues.

Thomas A. Gray, P.E., is manager of the Energy and Natural Resources Group for the Pittsburgh office of Tetra Tech NUS. The group provides engineering and environmental services to the mining, electric utility, and oil and gas industries and to state and federal agencies. Gray received a B.S. degree in mining engineering from the Pennsylvania State University in 1973 and an M.B.A. from the University of Pittsburgh in 1977. He is a registered professional engineer in five states. Mr. Gray began his professional (continued next page)

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, September 13.**

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

Pittsburgh Geological Society

career in 1971 as a mining engineering intern for Leechburg Mining Company. In 1973, he accepted a management trainee position with the Frick District of U.S. Steel in Uniontown, PA. He subsequently became an assistant mine foreman at the Maple Creek Mine. In 1978, he joined Dravo Engineers and Constructors as a mining engineer. He advanced to senior mining engineer responsible for the supervision of mining-related projects for its Civil Mining and Marine Division. In 1986, he joined GAI Consultants as an engineering manager. He spent 21 years with GAI, serving as manager of its Charleston, WV office and as director of Business Development. He joined Tetra Tech NUS in 2007. Mr. Gray has been a member of the Board of Directors of the Pittsburgh Section of SME for more than 10 years. He has served the section as chair, secretary, treasurer and program chair and has served on several SME national committees. He has written more than 30 technical publications, including a chapter on mine closure, sealing and abandonment for the SME Mining Engineering Handbook, 1992 edition. He was selected as a Distinguished Member of the Pittsburgh Section in 1995 and as a National SME Distinguished Member in 2009.

PRESIDENT'S MESSAGE

“Summer” is gone, except for the heat, and we are on our way into the next cycle of exciting programs, field trips, workshops, and conferences. We look forward to your participation in these events and remind you to read the Newsletter and check your email and the PGS website for announcements. This year, Professional Geologists will need to secure CEUs to fulfill their license requirements. PGS will be issuing certificates of attendance at all appropriate events to qualifying attendees. As we all are aware, these events take the efforts of many to prepare and present. PGS will have a number of committees needing assistance. Please step forward to lend a hand, especially if you haven't in a while. See you soon.

Mary Ann Gross, PGS President 2010-11

ORIGINS OF WESTERN PA PLACE NAMES

On March 12, 1800, the Pennsylvania Legislature passed an act separating Crawford County from the territory of Allegheny County. It was a huge area, temporarily encompassing what are now five or six counties in northwestern Pennsylvania, with Meadville as its seat of government. The county was named in honor of Colonel William Crawford, a staunch defender of the white settlers in the area. He was captured by the Indians while in command of an expedition returning from Ohio and tortured to death. Crawford County's most well-known town is Titusville, the home of the famous Drake oil well, drilled in 1859 (nearby in Venango County, but we won't quibble!).

DON'T FORGET TO RENEW

It's time to renew your PGS membership for the 2010-2011 season. Please fill out the membership application included with this newsletter and return it with your dues to John Harper at the address on the form.

DID YOU KNOW . . . ?

- Water and other volatiles were present during the last phases of the Earth's formation, as revealed by silver isotopes in mantle rocks, but they didn't arrive by comet.
- While the large earthquakes recorded in Haiti, Chile, and Taiwan drew national attention, a 3.8 magnitude quake hit northern Illinois in February. It didn't cause much damage, but scared a lot of people.
- Although the news has been full of stories about volcanoes recently, there is no connection among all the eruptions. The spate of activity is not unusual.
- Paleontologists from Yale University have discovered about 1,500 fossils of soft-bodied Early Ordovician animals in Morocco, casting doubt on whether the Cambrian-Ordovician extinction actually took place.
- Research suggests that the Earth was completely frozen like a giant snowball during part of the Late Precambrian. This "Snowball Earth" hypothesis helps explain strange isotopic signatures discovered in overlying rocks.

- Continents are relatively hot because they contain most of the Earth's radioactive uranium and potassium. Wherever the crust is thickened, such as in mountain ranges, radioactive decay tends to heat things up.
- Planetary scientists have recently come up with a possible explanation for a curious pattern of honeycombs and flat valleys with irregular edges seen on Saturn's moon Titan – karst topography.
- Even as early as the mid-1990s, researchers from University of Michigan showed that the world's lakes are pumping CO₂ into the atmosphere, rather than acting as carbon sinks.
- The presence of fossils of the fungus *Reduviasporonites* (which thrives in times of forest devastation) at the end-Permian mass extinction event points to rapid environmental change, not an asteroid impact, as the cause of the greatest of all extinctions.
- The state's mine subsidence insurance program has increased the maximum coverage for a dwelling from \$250,000 to \$500,000.
- By a vote of 48 to 9 in early August, the New York State Senate approved a measure that would suspend drilling in the New York portion of the Marcellus Formation, pending further environmental studies.
- Hikers in the Jura Mountains of France discovered some of the largest dinosaur footprints ever documented, each 4.5 to 5 feet in diameter.

EASTERN SECTIONAL AAPG ANNUAL MEETING 2010

“Perseverance-the Pipeline to Prosperity” - the Eastern Section AAPG Annual Meeting will be held in Kalamazoo, Michigan on September 25 through 29, 2010. Featured are three technical session symposia on Shale Petroleum Systems in Onshore Basins of Eastern North America with additional technical sessions on: Trenton/Black River Petroleum Reservoirs, Carbon Sequestration, and Reservoir Characterization. There will also be Poster Sessions, Field Trips, Short Courses, Core Workshops, and lots of rubbing of elbows and bending arms with other geologists. The meeting is hosted by the Michigan Basin Geological Society. The registration web site is

<http://aapgesmeeting2010.mgbs.org/meetinginfo.html>.

FALL COALBED METHANE FORUM

The North American Coalbed Methane Forum will hold its Fall Session November 9-10, 2010 at the Hilton Garden Inn in Morgantown, WV. By attending the session you will be eligible for 6.0 professional development hours as mandated by the law. For additional information, please contact Ihor Havryluk at 412-445-5803, havryluk@zoominternet.net or Dr. Kashy Aminian at 304-293-3964, kaminian@wvu.edu. You may also visit the website at www.nacbmforum.com.

PGS Website of the Month

<http://www.shangri-la-river-expeditions.com/wchinageo/wchinageo.html>

FIELD CONFERENCE OF PA GEOLOGISTS

The 75th Annual Field Conference of Pennsylvania Geologists – Tectonics of the Pennsylvania Piedmont along the Susquehanna River, will start with an evening symposium on September 23, 2010 at the Marriot Lancaster at Penn Square, Lancaster, PA and continues through Friday and Saturday September 24-25, 2010 with field trips. Hosted by the Pennsylvania Geological Survey and Franklin and Marshall College. For additional information please visit <http://fcopg.org>.

TREASURER'S REPORT

The treasurer's report on the financial status of the society will be available to the membership soon. Please contact Steve McGuire at (412) 809-6723 or smcguire@chesterengineers.com.

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Did you Know...? and Western PA Place Name Columns. All the best to everyone and hope you had a pleasant Summer! Robert Botterman (ed.)

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email at patrick.burkhart@sru.edu.

News items: To submit a news item in 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. Be sure to also send an email address and phone number where you may be contacted.

PGS CORPORATE SPONSORS

ACA Engineering, Inc.
American Geosciences, Inc.
AGES, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
The Baron Group, Inc.
Benedum Interests
Civil & Environmental Consultants, Inc.
CNX Gas Corp.
CP Environmental Group, Inc.
Cummings/Riter Consultants, Inc.
DC Energy Consultants
DiGioia, Gray & Associates, LLC
Enviro-Equipment, Inc.
Field Environmental Instruments, Inc.
GAI Consultants, Inc.

Groundwater & Environmental Services, Inc.
HDR Engineering, Inc.
Highpointe Oil & Gas, LLC
Hotwell Services, Inc.
Howard Concrete Pumping Company, Inc.
The Hutchinson Group, Inc.
Key Environmental, Inc.
Lenape Resources, Inc.
Moody and Associates, Inc.
Northeastern Energy Consulting, Inc.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
PennVirginia Oil & Gas Corp.
Seneca Resources Corporation
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 2

Robert Botterman, Editor

October, 2010

Wednesday, October 20, 2010

**The Pittsburgh Geological Society and the
Pittsburgh Section of the Society of Mining Engineers present**

New Age Constraints of Ammonoids within the Dry Mountain Trough, Nevada: Implications for Cisuralian Paleoenvironmental Reconstructions on western Pangaea

by **Tamra A. Schiappa**

Department of Geography, Geology and the Environment,
Slippery Rock University, Slippery Rock, PA, USA 16057;
tamra.schiappa@sru.edu

Unique ammonoid faunas have been identified from the Dry Mountain trough (DMT), Nevada, a tectonic basin that developed along the western margin of North America approximately 291 – 285 million years ago (Snyder et al., 2008; 2002; Trexler et al., 2004). The DMT provides a snapshot of ammonoid paleoecology. Within this basin paleoenvironmental reconstructions can be clearly defined based on the spatial segregation and presence of boreal (Uraloceras, Prothalassoceras, Metalegoceras), equatorial (Properrinites, Bamyaniceras), cosmopolitan (Crimites, Neocrimites, Agathiceras, Almites), North American (Akmilleria, Stenolobulites) and local endemic (Nevadoceras) genera (Schiappa, 1993; Schiappa et al., 2005). Ammonoid distributions and spatial segregation suggest that the area is transitional between boreal and equatorial realms. Two key localities, Portuguese Springs (PS) and Beck Springs (BS), record the same depositional environment yet reflect distinct biological communities. The Portuguese Springs fauna consists of genera that are characteristic of equatorial, warm-water realms along with locally endemic, North American and cosmopolitan forms, whereas the genera at Beck Springs are characteristic of boreal, cool-water environments along with North American and cosmopolitan forms. These distinct fauna in close proximity suggest the presence of an ecotone lies between PS and BS.

(continued next page)

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost \$25.00/person, students \$5.00; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, October 18.**

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

Pittsburgh Geological Society

The preliminary results from our analyses indicate that the conodonts from PS yield an $^{87}\text{Sr}/^{86}\text{Sr}$ ratio value of 0.707769 ± 21 , corresponding to an age of 292.1 ± 1.0 ma (Middle Sakmarian, Tastubian) according to the Urals calibration curve produced by Schmitz and others (2007). The conodont analysis from BS indicates an $^{87}\text{Sr}/^{86}\text{Sr}$ value of 0.707647 ± 11 , corresponding to an age of 289.6 ± 0.3 ma (Early Artinskian, Burtsevian) according to the Urals calibration curve (Schmitz et al., 2007). Continued analyses of conodont elements from these localities will provide further constraints on the timing of basin initiation, and a better understanding of environmental conditions and ammonoid migrations into the DMT.

Tamra A. Schiappa, Ph.D. - Associate Professor, Department of Geography, Geology and the Environment, Slippery Rock University. Dr. Schiappa received a B.S. in geology from SUNY Plattsburgh, a MS in Earth Science from Boise State Univ. and Ph.D. in Geology from Univ. of Idaho. Her research involves Upper Paleozoic conodont and ammonoid biostratigraphy of northern Pangaea; development of the Cisuralian time scale; and stratigraphy and carbonate sedimentology. She is actively involved in an international effort to build the Permian time scale and developing an understanding of the development of the western margin of North America and the assembly of Pangaea.

THE JOHNSTOWN FIELD TRIP

The proposed field trip to Johnstown, originally scheduled for spring 2010 has been postponed until the spring of 2011 or even summer, sometime after the GSA meeting. If someone else wants to pick it up and run with it, please contact Judy Neelan for the contact information. If anyone has ideas for additional field trips or wishes to run one, please contact Judy Neelan (jneelan@state.pa.us) or Mary Ann Gross (magrs@yahoo.com) Thanks.

ORIGINS OF WESTERN PA PLACE NAMES

Quakertown, in Lawrence County, was a small village and railroad station near where Quakertown Run flows into the Mahoning River near the Ohio-Pennsylvania boundary. The first settlers to the area were Septimus Cadwallader, Benjamin Sharpless, and Talbot Townsend, who moved there in the early 1800s. All three were Quakers, so the place became known as Quakertown. Later in the 1800s, I. C. White detailed the geology of Lawrence County and named the coal beneath the Lower Connoquenessing sandstone (Pennsylvanian, Pottsville Formation) the Quakertown coal. The town also gave its name to Quakertown Falls where Quakertown Run crosses the very resistant sandstone of the Lower Connoquenessing. The falls can still be seen where US 224 crosses Quakertown Run about $\frac{1}{2}$ mile east of the Ohio line.

DON'T FORGET TO RENEW

It's time to renew your PGS membership for the 2010-2011 season.

If you haven't already done so, please fill out the membership application included with this newsletter and return it with your dues to John Harper at the address on the form.

DID YOU KNOW . . . ?

- Both China and India are investing in or drilling for shale gas resources. Reliance Industries, India's biggest company, has already invested in Atlas Energy's Marcellus program, and they are looking to move into the Horn River basin in British Columbia.
- The life expectancy of the average US citizen currently is at 77.7 years. This means we will EACH need to have a staggering 2.9 million pounds of resources to provide the products and materials we have come to depend on during our lifetimes.
- Researchers now think the Earth and moon are about 150 million years younger than previously supposed, which helps support the idea that the Earth was created by the collision of two Mars-sized planets.
- Triceratops and Torosaurus are the same thing. It turns out that Triceratops is based on juvenile skulls, whereas Torosaurus is based

on adult skulls. There is a continuous gradation in shape between them.

- A new model of the Earth's core suggests that the inner core crystallizes in the west and melts in the east, with the solid iron moving eastward at a pace of about 0.6 inches per year and melting with it reaches the eastern edge.
- In February, 2010, PA Governor Rendell signed into law legislation to create a review board for disputes between landowners who own the surface rights but not the mineral rights on their property and coalbed methane developers.
- A new study suggests that transgressive/regressive oscillations in sedimentary sequences deposited over 2 to 20 million years might be caused by regional patterns of small-scale convection in the mantle.
- In late August, Voyager 2 completed 33 years of continuous operations since its launch in 1977. It has traveled more than 13 billion miles through the Solar System toward interstellar space and is now 8.7 billion miles from the sun.
- Paleontologists have found the fossils of a sperm whale that they named Leviathan melvillei in honor of Herman Melville, author of Moby Dick. At 40 feet long and with a skull 10 feet long, it probably fed on other whales.

FALL COALBED METHANE FORUM

The North American Coalbed Methane Forum will hold its Fall Session November 9-10, 2010 at the Hilton Garden Inn in Morgantown, WV. By attending the session you will be eligible for 6.0 professional development hours as mandated by the law. For additional information, please contact Ihor Havryluk at 412-445-5803, havryluk@zoominternet.net or Dr. Kashy Aminian at 304-293-3964, kaminian@wvu.edu. You may also visit the website at www.nacbmforum.com.

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

Joint NE-NC GSA Meeting, Pittsburgh, PA 19-22 March 2011

The PGS will join other local societies to host the Joint NE-NC GSA meeting, Pittsburgh, PA 19-22 March 2011, at the Omni William Penn Hotel (www.geosociety.org/Sections/ne/2011mtg/);

Abstract deadline is 14 December 2010 though the GSA webpage www.geosociety.org. Please consider helping to sponsor student and teacher participation (contact Maury Deul mdeul@comcast.net), retaining an exhibit booth (Barb Hammel bhammel@keyenvir.com), participating as a professional mentor for students (Eric Straffin estraffin@gmail.com), or by contributing to programs for earth science teachers (Ray Follodor geodawg@comcast.net). Questions can be addressed to Patrick Burkhart, NE meeting chair (patrick.burkhart@sru.edu), or Tom Anderson, NE Technical Program chair (taco@pitt.edu).

CARNEGIE MUSEUM OF NATURAL HISTORY- NATIONAL FOSSIL DAY

To help celebrate the 2010 National Park's National Fossil Day on Wednesday, October 13, Albert D. Kollar of the Carnegie Museum of Natural History will speak at the museum's volunteer coffee meeting on Great Fossil Discoveries of Western Pennsylvania. Topics discussed: 1. Edward Miller's Brush Creek fossils of 1835; 2. Percy Raymond's discovery of the first vertebrate remains in the Pittsburgh red beds, Pitcairn, PA; 3. The giant arthropod trackway of a eurypterid in Elk County, PA; 4. Ice Age mammal fossils recovered in the Devonian Limestone caves, New Paris, PA; and 5. The fossil amphibian *Fedexia* and fossil forest in Moon Twp. PA. Also in October the Carnegie Museum of Natural History, Section of Invertebrate Paleontology, PAIS geology program coordinated by Albert D. Kollar and David K. Brezinski, will lead a geology hike through Schenley and Frick Parks, and overview of the Monongahela River Valley from Calvary Cemetery.

PGS Website of the Month

<http://earthquake.usgs.gov/research/parkfield/>

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email at patrick.burkhart@sru.edu.

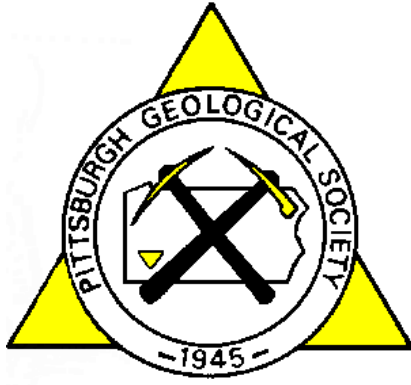
News items: To submit a news item in the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at rbottgeo@aol.com. Be sure to also send an email address and phone number where you may be contacted.

PGS CORPORATE SPONSORS

ACA Engineering, Inc.
American Geosciences, Inc.
AGES, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
The Baron Group, Inc.
Benedum Interests
Civil & Environmental Consultants, Inc.
CNX Gas Corp.
CP Environmental Group, Inc.
Cummings/Riter Consultants, Inc.
DC Energy Consultants
DiGioia, Gray & Associates, LLC
Enviro-Equipment, Inc.
Field Environmental Instruments, Inc.
GAI Consultants, Inc.

Groundwater & Environmental Services, Inc.
HDR Engineering, Inc.
Highpointe Oil & Gas, LLC
Hotwell Services, Inc.
Howard Concrete Pumping Company, Inc.
The Hutchinson Group, Ltd.
Key Environmental, Inc.
Lenape Resources, Inc.
Moody and Associates, Inc.
Northeastern Energy Consulting, Inc.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
PennVirginia Oil & Gas Corp.
Seneca Resources Corporation
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 3

Robert Botterman, Editor

November, 2010

Wednesday, November 17, 2010

The Pittsburgh Geological Society presents

Colliding Terranes and Volcanic Eruptions: Geologic Events that Shaped Denali National Park and Mineral Resources in South-Central Alaska

By **Ron Cole**

Dept. of Geology, Allegheny College, Meadville, PA 16335

ron.cole@allegheny.edu

South-central Alaska, including Denali National Park, was shaped by a dynamic tectonic history that included terrane collision and unique episodes of volcanism during early Cenozoic time. Field observations show that volcanic systems ranged from complex composite volcanoes to small lava plateaus fed by fissures. One composite volcano complex formed the Paleocene Cantwell volcanic rocks that are preserved within Denali National Park. Cantwell volcanic activity included pyroclastic eruptions, the outpouring of lavas, and catastrophic debris avalanches analogous to those that formed during the 1980 eruption of Mt. St. Helens. The Cantwell volcanics filled a basin that formed by north-south shortening during Late Cretaceous terrane accretion. The Cantwell volcanics were subsequently deformed along the Denali fault system, a major strike-slip fault in southern Alaska that remains active today. Field relationships, radiometric ages, and geochemical data show that the Cantwell volcanics correlate across the Denali fault with granitic plutons that form the high peaks of the Alaska Range (including Mt. Denali, the tallest peak in North America).

More regionally, radiometric ages and geochemical data for Cenozoic volcanic and plutonic rocks across south-central Alaska show that these igneous rocks did not form as part of a 'typical' continental margin arc system. Instead they were formed during mantle emplacement and high heat flow following spreading
(continued next page)

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, October 18.**

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

Pittsburgh Geological Society

ridge subduction and/or slab break off upon terrane accretion. While economic mineral deposits of southern Alaska are associated with Late Cretaceous and Cenozoic igneous rocks, there is a lack of basic understanding of the origin and geologic context of the host magmatic systems. This ongoing research will provide a geologic framework for magmatism that can be applied to better understand the plate kinematics that shaped southern Alaska and better predict the origin and distribution of mineral deposits.

Short Bio:

Ron Cole is in his 16th year in the Geology Department at Allegheny College where he teaches Field Geology, Environmental Geology, Mineralogy & Petrology, and Structural Geology. He has conducted research in wilderness areas of Alaska since 1994, focusing on links between Cenozoic magmatism and plate tectonic processes. Cole has received grants from the National Science Foundation, National Geographic Society, and the American Chemical Society Petroleum Research Fund in support of this research.

EASTERN SECTION AAPG MEETING IN KALAMAZOO, MI

The Eastern Section of the American Association of Petroleum Geologists held its annual meeting in Kalamazoo, Michigan on September 25th through 29th. The meeting was well attended with many of the attendees there for the numerous sessions on the topic of shale plays in the northeastern United States. The shale plays discussed included the Antrim and Collingswood/Utica of Michigan (although the Collingswood is not actually a shale, but a high TOC carbonate member of the Trenton Limestone), the New Albany of the Illinois Basin and the Marcellus and Utica Shales of the Appalachian Basin. Carbon Sequestration presentation were also a large portion of the program and very well attended.

The meeting included fieldtrips to an impact site in Kentland, Indiana, a tour of a Silurian salt mine in eastern Michigan and an outcrop tour of Pennsylvanian fluvial-deltaic systems in central Michigan. Workshops included a shortcourse on QA/QC of subsurface mapping, sponsored by AAPG's Division of Professional Affairs and two core workshops; one investigating cores of the Trenton and Black River carbonates and one investigating cores of the Antrim Shale, Collingswood high-TOC carbonate and A-1 member of the Salina Salt.

Next year's Eastern Section AAPG meeting will at Washington D.C. Early planned sessions include discussions of the energy industry and public policy and the continued exploration and development of continuous/unconventional plays,

such as the eastern shale plays.

Also of note, the 2013 National AAPG meeting will be in Pittsburgh, PA in May of that year. Although details are almost non-existing at this time, stay posted for more information as it becomes available.

ORIGINS OF WESTERN PA PLACE NAMES

Wellersburg is a borough in along the Cumberland Highway (PA Rout 160) in southern Somerset County just north of the state boundary with Maryland. The town was laid out in 1830 by George Weller, for whom it was named. The town was a center of coal mining and iron manufacturing during the mid-1800s. It lends its name to the Wellersburg syncline, as well as to the Wellersburg coal, limestone, and claystone, which occur within the Pennsylvanian Casselman Formation (upper Conemaugh Group) throughout southwestern Pennsylvania.

DID YOU KNOW . . . ?

- Debris flows are a type of landslide in which a mixture of soil, rock, and water flow downslope and have properties intermediate between avalanches and floods.
- The viscosity contrast between the upper mantle and the lower crust may control processes like the depth of earthquakes.
- Researchers have used X-rays to map chemicals in the early fossil bird,

Archaeopteryx. It turns out the phosphorus and sulfur indicate the critter really did have feathers, and the bones contained copper and zinc.

- A signal from Voyager 2, traveling at the speed of light, takes about 12.8 hours to reach Earth.
- Relatively firm Precambrian seafloors that were dominated by microbial mats (stromatolites) were replaced in the Early Cambrian by softer substrates colonized by burrowing organisms.
- The character and diversity of geology and geomorphology, as expressed by Earth's natural features, are essential to our wellbeing and need to be preserved.
- Several environmental catastrophes occurred in the Mediterranean region during the Miocene in which large water bodies like the Mediterranean and Black seas were cut off from the open ocean.
- These catastrophes resulted in hypersaline waters, destruction of ecosystems, and deposition of thick evaporite deposits.
- Landslide occurrence and movement are primarily governed by the shear strength of the slip surface.
- Triassic and Lower Jurassic lacustrine rocks of the Newark Supergroup in eastern North America were deposited in a long chain of rift valleys prior to the breakup of Pangea.
- Based on data from all over the world, it appears that rivers with bedloads consisting of sediment with median grain diameters between 1 and 10 mm are very rare. Most rivers have beds composed of very fine (~0.25 mm) or very coarse (~25 mm) sediment.

FALL COALBED METHANE FORUM

The North American Coalbed Methane Forum will hold its Fall Session November 9-10, 2010 at the Hilton Garden Inn in Morgantown, WV. By attending the session you will be eligible for 6.0 professional development hours as mandated by the law. For additional information, please contact Ihor Havryluk at 412-445-5803, havryluk@zoominternet.net or Dr. Kashy Aminian at 304-293-3964, kaminian@wvu.edu. You may also visit the website at www.nacbmforum.com.

GSA - JOINT NORTHCENTRAL / NORTHEASTERN SECTION MEETING 20-21 MARCH 2011 IN PITTSBURGH, PA OMNI WILLIAM PENN HOTEL

The Northcentral / Northeast GSA will be held in Pittsburgh, March 20 – 22, 2011. For more information please see <http://www.geosociety.org/Sections/ne/2011mtg/index.htm>. Given the rich history of oil and gas exploration and the current resurgence of the Marcellus Shale play, abstracts on oil and gas and subsurface geology are being requested for presentations.

Abstracts should be submitted by 14 December 2010 using the following web site:

<http://www.geosociety.org/Sections/ne/2011mtg/echprog.htm>.

Only an abstract and a Power Point presentation are needed for the conference. Preparation of a full journal paper is **not** required. Abstracts should be 2000 characters, or less, not counting spaces. The GSA on-line system cannot accept abstracts longer than 2000 spaces.

For more information contact Patrick Burkhart at patrick.burkhart@sru.edu.

DON'T FORGET TO RENEW

It's time to renew your PGS membership for the 2010-2011 season.

If you haven't already done so, please fill out the membership application included with this newsletter and return it with your dues to John Harper at the address on the form.

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

PGS Website of the Month

<http://www.pbs.org/wgbh/nova/sciencenow/3318/01.html>

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email at patrick.burkhart@sru.edu.

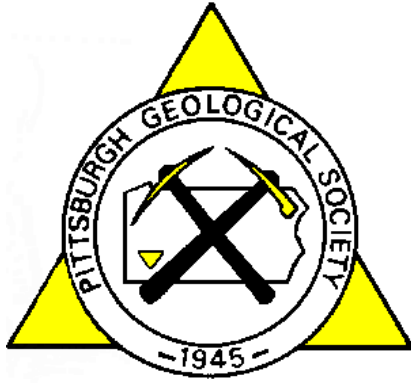
News items: To submit a news item in the PGS Newsletter, please contact Robert Botterman at (412) 780-3094, mail at 139 Brookmeade Dr., Pittsburgh, PA 15237, or email at rbottgeo@aol.com. Be sure to also send an email address and phone number where you may be contacted.

PGS CORPORATE SPONSORS

ACA Engineering, Inc.
American Geosciences, Inc.
AGES, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
The Baron Group, Inc.
Benedum Interests
Civil & Environmental Consultants, Inc.
CNX Gas Corp.
CP Environmental Group, Inc.
Cummings/Riter Consultants, Inc.
DC Energy Consultants
DiGioia, Gray & Associates, LLC
Enviro-Equipment, Inc.
Field Environmental Instruments, Inc.
GAI Consultants, Inc.

Groundwater & Environmental Services, Inc.
HDR Engineering, Inc.
Hetrick Mfg. Inc.
Highpointe Oil & Gas, LLC
Hotwell Services, Inc.
Howard Concrete Pumping Company, Inc.
The Hutchinson Group, Ltd.
Key Environmental, Inc.
Lenape Resources, Inc.
Moody and Associates, Inc.
Northeastern Energy Consulting, Inc.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
PennVirginia Oil & Gas Corp.
Seneca Resources Corporation
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 4

Robert Botterman, Editor

December, 2010

Wednesday, December 15, 2010

The Pittsburgh Geological Society presents

Charles Darwin and the origin of atolls

By **Michael Bikerman PhD, PG**
emeritus geology professor, University of Pittsburgh

Charles Darwin, best known for his "Origin of Species", also made his name in several geologic observations. During the voyage of the HMS Beagle from 1831–1836, he described coral atolls in the islands of the South Pacific. Darwin noted three basic types of reefs: fringing, barrier and atolls. All the reefs were constructed of coral and basically were similar in formation, but the geography of each type was different. Fringing reefs were attached to volcanic islands or other solid masses; barrier reefs were separated by sea water from such islands, or other supporting structures [think the Australian Great Barrier Reef], and atolls were approximately circular islands with no visible attachment rock. His prescient explanation was that a volcano in tropical waters would host a fringing reef, and as time passed the volcano would sink and the growing coral would extend upwards so as to stay in suitable water depths. Later on the volcano would entirely disappear, leaving an atoll alone in its circular beauty. In those pre-plate tectonics days there was no known mechanism for the subsidence of volcanoes, so sea-level fluctuation and consequent drowning was invoked.

This elegant model had several challenges and it was not until the US drilled several deep holes and discovered basalt beneath about a mile of coral that the model was universally accepted.

In this presentation we shall look at the geological evidence for Darwin's hypothesis using some of the most beautiful tropical paradises which I have visited, and some superb satellite images from NASA.

(continued next page)

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, October 18.**

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

Pittsburgh Geological Society

Short Bio: Speaker: Michael Bikerman PhD, PG is an emeritus geology professor from the University of Pittsburgh who taught physical geology, part of historical geology, geochemistry, ore deposits, general geology, geology of National Parks, and World Geography. His research was mostly in geochronology of igneous and some metamorphic rocks. He was president of PGS twice and a counselor to PGS for many years.

Michael went around the world three times on Semester at Sea, once as a geology professor and twice as Academic Dean. He now keeps active doing occasional lectures on cruise ships, a little consulting geology [largely in ore deposits], and volunteering at the local library.

PGS - FOOD BANK CONTRIBUTION

Please bring non-perishable food and grocery items to the December meeting to be donated to the Greater Pittsburgh Community Food Bank. The Food Bank distributes food through a 380+ member network in 11 counties in southwestern Pennsylvania.

Through food solicitation, fund raising, special events, and community partnerships, the Food Bank gathers food at their 94,000-square foot warehouse in Duquesne, PA. Through outlets such as soup kitchens, food pantries, shelters, after school programs, senior high rises, MH-MR drop-in centers, neighborhood food assistance agencies, emergency or disaster-related feeding sites, regional food banks, Meals on Wheels, community centers, and special programs, the Food Bank currently distributes around 21 million pounds of food per year. Greater Pittsburgh Community Food Bank is a member of Feeding America (formerly America's Second Harvest).

Most needed items include - Cereal (high fiber, low sugar), Tuna, Canned Salmon (packed in water), Fruit, Vegetable Juice (100%, any size), Canned Beans (kidney, black, navy), Canned Vegetables, Peanut Butter (15 or 18 oz), Canned Fruit, Toilet/Facial Tissue, Laundry Detergent, and Diapers (baby & adult). You can also think "holidays" and donate holiday meal items, like boxed stuffing mix or potatoes, canned pumpkin or yams, canned veggies, bread and dessert mixes, baking supplies, gravy mixes - these items are especially appreciated around the holidays! NO GLASS JARS PLEASE.

GSA - JOINT NORTHCENTRAL /

NORTHEASTERN SECTION MEETING 20-21 MARCH 2011 IN PITTSBURGH, PA OMNI WILLIAM PENN HOTEL

The Northcentral / Northeast GSA will be held in Pittsburgh, March 20 – 22, 2011. For more information please see <http://www.geosociety.org/Sections/ne/2011mtg/index.htm>. Given the rich history of oil and gas exploration and the current resurgence of the Marcellus Shale play, abstracts on oil and gas and subsurface geology are being requested for presentations.

Abstracts should be submitted by 14 December 2010 using the following web site:

<http://www.geosociety.org/Sections/ne/2011mtg/techprog.htm>.

Only an abstract and a Power Point presentation are needed for the conference. Preparation of a full journal paper is **not** required. Abstracts should be 2000 characters, or less, not counting spaces. The GSA on-line system cannot accept abstracts longer than 2000 spaces.

For more information contact Patrick Burkhart at patrick.burkhart@sru.edu.

ORIGINS OF WESTERN PA PLACE NAMES

Scrub grass is another name for the common scouring rush, although these days most people use the word to describe a combination of grass and low shrubs. Scrub grass apparently is common in southwestern Venango County because the settlers there used the name for both a creek and, beginning in 1806, a township. Scrubgrass Creek also lends its name to the Scrubgrass coal and underclay sequence in the lower Allegheny Formation (Pennsylvanian) of western Pennsylvania.

DID YOU KNOW . . . ?

- According to researchers at the University of Pittsburgh, plant-based plastics are not necessarily greener than oil-based plastics. Although biopolymers by themselves are more eco-friendly, farming and energy-intensive chemical processing means they are dirtier to produce than petroleum-derived plastics
- It might be a little late to mention it, but the United Nations designated 2010 as the International Year of Biodiversity.
- Methodological naturalism, the grounding principal of modern science, says that, in science, we can only look to naturalistic, as opposed to supernatural, explanations for the observations we seek to understand.
- Although climate scientists are concerned about the melting arctic ice cap, the arctic wasn't always so cold. Based on fossilized wood found on Ellesmere Island, researchers estimate that the arctic temperature dropped 19 degrees C during the last 4 million years.
- Bite marks on dinosaur bones indicate that our 75-million-year-old mammalian ancestors, like modern rodents, chewed on bones as a means of obtaining calcium and sodium in their diets.
- Osmium and iridium were discovered as residue by Smithson Tennant in 1803 when he dissolved crude platinum in aqua regia, a mixture of hydrochloric and nitric acids.
- If all you know about earthquakes is what you read in the newspaper, you might be surprised to find that the Richter scale actually goes into negative numbers. Some microquakes have been measured as small as -4.5.
- The Kilauea volcano in Hawaii is the world's most active volcano.
- A study published in the September issue of the Journal of Risk Research on such issues as climate change, nuclear waste disposal, and gun control concluded that, no matter how strong the scientific evidence is, the public will not change their minds if it conflicts with their person beliefs.
- The distributions of stable carbon ($^{13}\text{C}_1$ - $^{13}\text{C}_4$) and hydrogen ($^2\text{HCH}_4$) isotopes in Upper Ordovician gases from the central Appalachians show that the hydrocarbons were generated from early to post mature marine source rocks in Ordovician and possibly Cambrian strata.
- All gravity anomalies come from horizontal variations in density. Regardless of vertical variations in density, if all strata were of uniform density, there would be no gravity anomalies.
- Pennsylvania's rocks contain more than 30 times as much fresh groundwater as all the lakes, ponds, streams, and wetlands in the state.
- Researchers from the University of Illinois found that being overweight actually decreases your gas mileage. Simulations suggested that, if the rate of obesity in 2005 had stayed at 1981 levels, the average vehicle would have saved 4.6% in gasoline consumption over its lifetime.
- The greatest known global shift from warmer to cooler climate during the Cenozoic Era occurred near the Eocene-Oligocene boundary (around 34 million years ago).

DON'T FORGET TO RENEW

It's time to renew your PGS membership for the 2010-2011 season.

If you haven't already done so, please fill out the membership application included with this newsletter and return it with your dues to John Harper at the address on the form.

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

PGS Website of the Month

<http://jan.ucc.nau.edu/~rcb7/globaltext2.html>

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email at patrick.burkhart@sru.edu.

News items: To submit a news item in 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. Be sure to also send an email address and phone number where you may be contacted.

PGS CORPORATE SPONSORS

ACA Engineering, Inc.
American Geosciences, Inc.
**American Geotechnical &
Environmental Services, Inc.**
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
The Baron Group, Inc.
Benedum Interests
Civil & Environmental Consultants, Inc.
CNX Gas Corp.
CP Environmental Group, Inc.
Cummings/Riter Consultants, Inc.
DC Energy Consultants
DiGioia, Gray & Associates, LLC
Enviro-Equipment, Inc.
Field Environmental Instruments, Inc.
GAI Consultants, Inc.

Groundwater & Environmental Services, Inc.
HDR Engineering, Inc.
Hetrick Mfg. Inc.
Highpointe Oil & Gas, LLC
Hotwell Services, Inc.
Howard Concrete Pumping Company, Inc.
The Hutchinson Group, Ltd.
Key Environmental, Inc.
Lenape Resources, Inc.
Moody and Associates, Inc.
Northeastern Energy Consulting, Inc.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
PennVirginia Oil & Gas Corp.
Seneca Resources Corporation
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 5

Robert Botterman, Editor

January, 2011

Wednesday, January 19, 2011

The Pittsburgh Geological Society presents

Rock Glaciers or Debris-Covered Glaciers

by **Noel Potter, Professor Emeritus of Geology at Dickinson College in Carlisle, PA**

Rock glaciers are common features in alpine regions throughout the world, from Alaska to Antarctica. In most places they are Holocene features, formed since the last major glaciation, but in Antarctica some are several million years old. There has been considerable controversy over their internal composition—whether they are debris-covered glaciers or composed dominantly of debris with interstitial ice. Both probably exist. I will contrast rock glaciers to boulder fields such as several in Pennsylvania, whose origin is markedly different.

Short bio: Noel Potter is Professor Emeritus of Geology at Dickinson College in Carlisle. He has worked in Alaska, Wyoming, and Antarctica. In retirement he is studying periglacial deposits in the Pennsylvania in the Great Valley near Carlisle and at Hickory Run Boulder Field.

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, January 17.**

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

Pittsburgh Geological Society

GREETING THE NEW YEAR!

Hope your Holiday celebrations were enjoyable, and you are ready to begin 2011 with all sorts of exciting new plans. PGS will be ready with interesting monthly talks (and credits toward your Professional License), the GSA Northeastern Section Meeting in March (many PGS members have been heavily involved in its various preparations), the spring field trip to Johnstown, Student Workshops, and a variety of other activities. The PGS Website will be undergoing renovation, and we request suggestions for its improvement from you. We are looking at some new merchandise – T-shirts and such – but need your creative designs.

As of December, PGS has over 240 regular, student, honorary and corporate members! PGS has been going strong for 65 years and has a great legacy of being a valuable source of information, not just for its members, but for the general public with interests in the geology around them. This is a Society of volunteers, though, and it takes the Members to keep it going – with their various and varied specialties and ideas.

Bring out your thoughts and ideas for adventures you would like to see PGS take on – workshops, field trips, out-of-the-box types of events. PGS is not an abstraction - it's you and me - all 240+ of us! Daydream a little and get in touch!

Happy New Year! Mary Ann 724 873-3221 magrs@yahoo.com

CALL FOR NOMINEES

The Society is calling on the membership for interested candidates for next year's Officer and Director-at-Large positions.

There are 3 Director-at-Large positions that need to be filled. These positions are for a term of 2 years and require regular attendance at the Board meetings held 1 hour prior to the Social hour of each monthly Society meeting. The position requires that you become involved at some level in the monthly operations of the Society by aiding the Officers and Committees in various ongoing projects.

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 inform **Ray Follador**, Nominations and Elections Committee Chair, ASAP at 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.

PAIS FIELD TRIPS

PGS Board member Albert Kollar annually leads geology field trips sponsored by the Carnegie

Museum of Natural History in Oakland. The museum's special-interest group is called PAIS, which stands for "Patrons and *lauradanae* Supporters." It is named for the trilobite *Ameropiltonia lauradanae*.

PAIS went on its most recent field trip last October. It included stops at Pittsburgh's Calvary Cemetery, Schenley and Frick parks, and Duck Hollow to look at the topography and glacial history of the Pittsburgh area, as well as provide members with a few fun hours of fossil collecting.

PAIS provides a valuable service because geology as a hobby can satisfy intellectual curiosity about natural history and provide an understanding of where we live and why we have the landscape we have – where the roads are and where the bridges are built.

Also, as a science, geology relies in part on the eyes of observant amateurs to make advancements.

If you or someone you know, amateur or professional, would like to become a member of PAIS and join in the fun, contact Albert Kollar at the Section of Geology and Invertebrate Paleontology, Carnegie Museum of Natural History, 4400 Forbes Avenue, Pittsburgh, PA 15213, or email KollarA@CarnegieMNH.org.

PAIS GEOLOGY PROGRAM, WINTER SOCIAL / LUNCH / LECTURE

PAIS will hold its winter social/lunch/lecture on Saturday, January 15, 2011. The lecture, titled *The Geology and Origin of the Marcellus Shale*, will be presented by Dr. David K. Brezinski, Adjunct Associate Curator of Invertebrate Paleontology. Part II of the lecture will be *Drilling the Marcellus* by PGS member Dan Billman.

FIRST CALL FOR STUDENT ABSTRACTS

April, 21 2011 is the annual PGS-AEG-ASCE student night. Undergraduate and Graduate students will be invited to submit abstracts for consideration as oral and poster presenters. Details will follow in the February newsletter. Now is the time to consider this opportunity.”

ORIGINS OF WESTERN PA PLACE NAMES

Beaver County, one of eight new counties formed in western Pennsylvania on March 12, 1800, was named for the Big Beaver River, which was so called because of the large number of beavers once found along its banks. The origin of the Beaver Borough name is somewhat more controversial, however, because a state historical marker in town attributes the name to King Beaver (*Tamaqui* or *Amockwi*), a chief of the Delaware Indian tribe.

DID YOU KNOW . . . ?

- Even as far back as 1875, experts were predicting that, should the economically recoverable sources of conventional oil decline or cease, the world would be amply supplied with oil from shales.
- Many employers in the science and technology fields these days are looking for potential employees with broad multidisciplinary backgrounds such as geology and business.
- Paleoanthropologists have determined that *Australopithecus afarensis*, one of our earliest ancestral species, was butchering meat with stone tools as far back as 3.4 million years.
- If the amount of oxygen in the atmosphere is less than 15%, it is virtually impossible for a fire to spread; if the amount is greater than

25%, even waterlogged environments can sustain large fires.

- Conductivity as a measure of ion and metal concentration in streams and other surface waters can be used to monitor the effects of mining and other human activities on watershed health.
- Scientists working on Baffin Island in the Canadian Arctic discovered a lava flow from 60 million years ago that came from a section of the mantle that has not undergone any melting or mixing in nearly 4.5 billion years.
- If you think the best way to save energy is by turning off the lights, you are incorrect. The best way is by installing energy-efficient devices such as light bulbs and appliances.
- On the same note, most people tend to underestimate the amount of energy needed to operate common everyday items such as computers.
- *Archaeopteryx* has been displaced as the first bird. A rigorous comparison of *Archaeopteryx* with other ancient bird-like creatures, modern birds, and the dinosaurs believed to have led to modern-day birds concludes that “Archie” was just another feathered dinosaur.

PGS Website of the Month

<http://geology.com/usgs/bakken-formation-oil.shtml>

*If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the *Did you Know...?* and *Western PA Place Name 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. Be sure to also send an email address and phone number where you may be contacted.

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

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

Officer Contacts: If you wish to contact a current PGS Officer, please call or email Mary Ann Gross, President, at 724 873-3221 / magrs@yahoo.com or mgross@rangeresources.com; Patrick Burkhart, Vice President, at 724 738-2502 / patrick.burkhart@sru.edu; Steve McGuire, Treasurer, at 412 809-6723 / smcguire@chesterengineers.com; William Gould, Secretary, at 412 389-2859 / wwgould@wwgeosciences.com.

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email [at patrick.burkhart@sru.edu](mailto:patrick.burkhart@sru.edu).

PGS CORPORATE SPONSORS

ACA Engineering, Inc.
American Geosciences, Inc.
American Geotechnical &
Environmental Services, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
The Baron Group, Inc.
Benedum Interests
Civil & Environmental Consultants, Inc.
CNX Gas Corp.
CP Environmental Group, Inc.
Cummings/Riter Consultants, Inc.
DC Energy Consultants
DiGioia, Gray & Associates, LLC
Enviro-Equipment, Inc.
Field Environmental Instruments, Inc.
GAI Consultants, Inc.

Gannett Fleming, Inc.
Groundwater & Environmental Services, Inc.
HDR Engineering, Inc.
Hetrick Mfg. Inc.
Highpointe Oil & Gas, LLC
Hotwell Services, Inc.
Howard Concrete Pumping Company, Inc.
The Hutchinson Group, Ltd.
Key Environmental, Inc.
Lenape Resources, Inc.
Moody and Associates, Inc.
Northeastern Energy Consulting, Inc.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
PennVirginia Oil & Gas Corp.
Seneca Resources Corporation
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 6

Robert Botterman, Editor

February, 2011

Wednesday, February 16, 2011

The Pittsburgh Geological Society presents

***A River Runs Through It: Linking Short Term Deformation
and Long Term Geodesy.***

**By Claudio Berti, Ph.D., Post-Doctoral Research Associate
Department of Earth and Environmental Sciences, Lehigh University, Bethlehem – PA**

Long term landscape evolution in tectonically active areas carries the integrated fingerprint of processes acting repeatedly on short, rupture-event time scales and that a unique signature can be resolved and extracted from topography using techniques whose integration has yet to be fully realized.

A major challenge in active tectonics is bridging the temporal gap between geology and geophysics that record the cumulative effect of fault ruptures in building topography over long time spans and the coseismic deformation field, measured over short time spans. Key problems related to strain partitioning in the crust and fault unsteadiness require linking the geologic and geodetic measurements, but such studies have proven to be elusive. The conversion of elastic stresses into permanent deformation during the co-seismic part of the earthquake cycle are ultimate what builds topography, but we have few examples of how that process occurs.

The coseismic part of the earthquake cycle is particularly well studied using several different geodetic techniques including GPS and InSAR. Over the past several years the accessibility to SAR scenes and increased ease in computational processing has elevated DInSAR to a primary role in gathering surface deformation data, particularly where GPS geodesy coverage is sparse or of short duration. There remain few studies dedicated to using DInSAR to describe the interseismic phase of the earthquake cycle.

Similarly tectonic geomorphology and paleoseismic approaches like fault scarp trenching and diffusion modeling constrain the coseismic behavior of active faults. However, with reduced fidelity, geomorphic metrics like mountain front segmentation also project the coseismic deformation over many earthquake cycles. Forming a continuum between the topography and an individual fault surface rupture are rivers, the gradients of which are delicately adjusted to the instantaneous and cumulative tectonic forcing.

Knickpoints are the features in the long profile that are formed instantaneously by base level fall during the co-seismic part of the earthquake cycle where a stream crosses a surface rupture (among other processes). Our studies of the 2009 L'Aquila, Italy earthquake and of the long profiles of streams in the uplifted footwall of the basin boundary fault

(continued next page)

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, February 14.**

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

(L'Aquila basin, Italy) suggests that the knickpoints of many earthquakes persist in the profile and that if their headward migration process can be modeled, the steadiness of the range front fault can be determined.

Our proposed approach, bridging observation from different time scales, stands to expand these observations into the long term landscape evolution history.

Dr. Berti received both his undergraduate and graduate degree in geology from the University of Rome - Italy. He worked for the Italian Geological Survey, surveying numerous quadrangle of the new edition of the Geologic Map of Italy, focusing both on bedrock geology (carbonate platform stratigraphy) surficial deposit and basin evolution. He received his Ph.D. in Geodynamic and Evolution of the Lithosphere in 2009 from the University of Chieti - Italy. The object of his Ph.D. research was to understand the timing of the migrating extension in a sin- and post-collisional mountain belt (Italian Apennines).

He is a geological geomorphologist with broad interests in the evolution of landscapes and their response to tectonic forcing. Landscapes are the result of intermediate to long-term tectonic processes that build topography and the corresponding surface processes that tear them down by erosion. His current post-doc research at the Lehigh University is involved in InSAR (Interferometric Synthetic Aperture Radar) geodesy, and its range of applicability in landscape evolution studies. As a powerful geodetic tool, InSAR is currently and proficiently used in the study of rapidly deforming landscapes associated with faults or volcanoes. His research is currently focused on integrating the short term signal of deformation detected from advanced InSAR technique (time-series, persistent scatters) with the medium term landscape evolution history inferred by drainage basin tectonic geomorphology and river long profile modeling. He has recently been involved in the application of radar interferometry to measure ice velocity and mass lost on ice-sheets. Additional duties at Lehigh also include acting as an adjunct professor of Physical Geology and for the Field Camp summer program.

Pittsburgh Geological Society

STUDENT NIGHT CALL FOR ABSTRACTS!

Requested jointly by the societies of AEG, PGS and ASCE

Students are invited to submit abstracts of a Senior Research Project, Senior Design Project, Master's or PhD Thesis for presentation at the Ninth Annual Student Night joint meeting of the Association of Environmental & Engineering Geologists, the Pittsburgh Geological Society, and the Geotechnical Group of the Pittsburgh Section of the American Society of Civil Engineers.

Abstracts on the following topics are welcome: Geology, Engineering Geology, Geotechnical Engineering, Environmental Engineering, Hydrogeology, and Hydrology.

Each Society will select one abstract to be presented in a 15 minute oral presentation. Each of the 3 oral presentations will be given a \$100 award. Each Society will select one abstract to be presented as a poster presentation. Each of the 3 poster presentations will be given a \$50 award. All submitted abstracts not selected above are invited to be presented as a poster presentation. All students who present their research that night will receive a one year student membership in the Society of their choice, a special award certificate, and dinner that evening. Please limit abstracts to 250 words.

Meeting Logistics: Date: April 20, 2011 Time: 6:00 p.m. Location: Foster's Restaurant, Foster Plaza Bldg. 10, Greentree, PA

The due date for abstract submittal is Friday, March 11, 2011

Abstracts should be submitted via email to Nichole Wendlandt. If you have any questions please email Patrick Burkhart, PGS, patrick.burkhart@sru.edu, Nichole Wendlandt, AEG, at nwendlandt@GFNET.com, or Suresh Gutta, ASCE, SGutta@agesinc.com **Notification will be given to the selected speakers by March 25, 2011.**

IS YOUR CONSULTING FIRM LISTED?

PGS has made available a list of area consultants via the <http://www.pittsburghgeologicalsociety.org/> website () as a source of contact information for the general public.

Reference in the list to any specific person, business, commercial product(s), process, service provider or service, trademark, or otherwise, does not constitute or imply an endorsement or recommendation by the

Pittsburgh Geological Society. If you would like to include your company and contact information in the list of area consultants, please provide your company information, including county and any of the following specialty codes (just list bold letter(s) of each - **General, Engineering and Geotechnical, Hydrogeology and Water, Environmental, Oil and Gas, Coal, Mineral Resources, Database Services, Other:** Specify) to ericailove@hotmail.com

CALL FOR NOMINEES

The Society is calling on the membership for interested candidates for next year's Officer and Director-at-Large positions.

There are 3 Director-at-Large positions that need to be filled. These positions are for a term of 2 years and require regular attendance at the Board meetings held 1 hour prior to the Social hour of each monthly Society meeting. The position requires that you become involved at some level in the monthly operations of the Society by aiding the Officers and Committees in various ongoing projects.

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 inform **Ray Follador**, Nominations and Elections Committee Chair, ASAP at 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.

GEOLOGY OF BUILDING STONES TALK

Albert D. Kollar will talk on the Geology of the building stones of Longfellow, Alden, & Harlow, architects of 188 commissions in late 19th and early 20th century Pittsburgh, including their most prestigious, the Carnegie Museum of Natural History and Carnegie Library, in Oakland, on February 04, 2011, Senior Men's Club, Sewickley, PA.

ORIGINS OF WESTERN PA PLACE NAMES

Glenshaw is a small community in Allegheny County that lies along Pine Creek and PA Route 8 about halfway between the Allegheny River and the Pennsylvania Turnpike. It was established early in the 1800s after John Shaw, Sr. bought 600 acres of land north of Pittsburgh and built a saw mill. The area became known as "Shaw's Glen", and later Glenshaw. In 1894, the Glenshaw Glass Company was founded by some glassblowers from Pittsburgh and two associates and became one of the more successful glass manufacturing companies in western Pennsylvania. At one time, the company produced 950 tons of glass per day. Today, the company is called Kelman Bottles LLC and produces glass containers for the food and beverage industry. Glenshaw is also the type locality of the Glenshaw Formation, the succession of Pennsylvania-aged rocks sandwiched between the top of the Upper Freeport coal and the top of the Ames Limestone.

DID YOU KNOW . . . ?

- The Upper Triassic Lockatong Formation found in the Philadelphia area is composed of cycles of fine-grained lacustrine sediments deposited in the Newark basin, which formed during rifting events

associated with opening of the present-day Atlantic Ocean.

- Scientists estimate the thickness of Permian rocks eroded from the Appalachian Plateau in Pennsylvania and West Virginia since the Alleghanian orogeny to have been approximately 14,500 feet (2.8 miles).
- If all you know about earthquakes is what you read in the newspaper, you might be surprised to find that the Richter scale actually goes into negative numbers. Some microquakes have been measured as small as -4.5.
- The average stream in Pennsylvania gets approximately 2/3 of its flow from groundwater.
- Testing for radon in Pennsylvania began when, in December 1984, a construction worker at the Limerick Nuclear Power Plant in Montgomery County repeatedly set off contamination alarms as he attempted to enter the plant. Investigation showed the contamination resulted from radon in the man's home.
- 3D seismic imaging in Greene County, Pennsylvania, shows that faulting in the Marcellus Formation has vertical offsets of as much as 250 feet.
- Delays in air travel in Europe early in 2010, caused by the eruption of Iceland's Eyjafjallajökull volcano, was the result of cold water from melted glacial ice chilling the lava so quickly that it fragmented explosively into shards of glass, which projected a thicker, denser ash into the stratosphere.

PGS Website of the Month

http://serc.carleton.edu/NAGTWorkshops/mineralogy/optical_mineralogy_petrography.html

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Did you Know...? and Western PA Place Name 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. Be sure to also send an email address and phone number where you may be contacted.

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

PGS Board-of-Directors

President:	Mary Ann Gross	Director-at Large:	Danielle Deemer	Director-at Large:	Albert Kollar
Vice President:	Patrick Burkhart	Director-at Large:	Maury Deul	Counselor:	John Harper
Treasurer:	Steve McGuire	Director-at Large:	Ray Follador	Counselor:	Mary Robison
Secretary:	Bill Gould	Director-at Large:	Erica Love	Counselor:	Charles Shultz
Past President:	Mike Forth	Director-at Large:	Barbara Hamel		

Other PGS Positions

AAPG Delegate:	Dan Billman	Webmaster:	Mary McGuire	Historian:	Judy Neelan
Newsletter Editor:	Robert Botterman				

Officer Contacts: If you wish to contact a current PGS Officer, please call or email Mary Ann Gross, President, at 724 873-3221 / magrs@yahoo.com or mgross@rangeresources.com; Patrick Burkhart, Vice President, at 724 738-2502 / patrick.burkhart@sru.edu; Steve McGuire, Treasurer, at 412 809-6723 / smcguire@chesterengineers.com; William Gould, Secretary, at 412 389-2859 / wvgould@wwgeosciences.com.

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email [at patrick.burkhart@sru.edu](mailto:patrick.burkhart@sru.edu).

PGS CORPORATE SPONSORS

ABARTA Oil & Gas Co., Inc.	Gannett Fleming, Inc.
ACA Engineering, Inc.	Groundwater & Environmental Services, Inc.
American Geosciences, Inc.	HDR Engineering, Inc.
American Geotechnical & Environmental Services, Inc.	Hetrick Mfg. Inc.
Ammonite Resources	Highpointe Oil & Gas, LLC
Anschutz Exploration Corp.	Hotwell Services, Inc.
ARK Resources, Inc.	Howard Concrete Pumping Company, Inc.
The Baron Group, Inc.	The Hutchinson Group, Ltd.
Benedum Interests	Key Environmental, Inc.
Billman Geologic Consultants, Inc.	Lenape Resources, Inc.
Civil & Environmental Consultants, Inc.	Moody and Associates, Inc.
CNX Gas Corp.	Natural Energy Development Corp.
CP Environmental Group, Inc.	Northeastern Energy Consulting, Inc.
Cummings/Riter Consultants, Inc.	Pennsylvania Drilling Co.
DC Energy Consultants	Pennsylvania Soil and Rock, Inc.
DiGioia, Gray & Associates, LLC	PennVirginia Oil & Gas Corp.
Dorso LP	Seneca Resources Corporation
Enviro-Equipment, Inc.	URS Corporation
Field Environmental Instruments, Inc.	Vista Resources, Inc.
GAI Consultants, Inc.	

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 7

Robert Botterman, Editor

March, 2011

Wednesday, March 16, 2011

The Pittsburgh Geological Society presents

***Perspectives on Earth Processes and Related Environmental
Conditions: Implications to Human Origins in Africa***

**Giday WoldeGabriel, PhD, Earth Environmental Sciences Division
Los Alamos National Laboratory, Los Alamos, NM 87545**

Africa underwent less extreme climatic and environmental fluctuations during the later part of Earth's history due to its migration to equatorial region and having insignificant motion there after. Its slow plate motion in the last 65 million years compared to the other continents led to uplift and subsequent voluminous volcanic eruptions, beginning at about 50 million years ago, which culminated in its ongoing break up into a continental and two oceanic rift basins along the northeastern part of the continent. The >3000 km-long African Rift System started to form between 30 to 25 million years ago and it provided favorable ecosystems for the proliferation of fauna and flora in the midst of sporadic but catastrophic volcanic eruptions, seismic activities, and other environmental hazards. Today, the African Rift System is well known for the longest and most complete records of human origins and associated material culture dating back to about 7 million years ago.

The presentation will highlight the geological and tectonic processes and the paleoenvironmental conditions that led to the habitation of the rift basins with diverse animals and plants, whose remains are being collected today.

Born and raised in Ethiopia Giday WoldeGabriel, PhD received his B.S. (Honors) and M.S. in Geology from Addis Ababa University in 1978 and 1980, respectively, and his Ph.D. in Geology, Case Western Reserve University, Cleveland, Ohio, 1987. He was a Director's Postdoctoral Fellow at Los Alamos National Laboratory (LANL) 1987-1990 and has been at LANL as a Technical Staff Member to the present.

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost **\$25.00/person, students \$5.00**; checks preferred. **Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, March 14.**

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

Tuesday, March 29, 2011

The Pittsburgh Geological Society and the Pittsburgh Association of Petroleum Geologists present

***From Outcrop Analogue to Flow Simulation: Understanding the Impact of Geologic
Heterogeneity on Hydrocarbon Production***

(See Page 2 for details)

From Outcrop Analogue to Flow Simulation: Understanding the Impact of Geologic Heterogeneity on Hydrocarbon Production

AAPG Distinguished Lecturer - Matthew D. Jackson PhD. Imperial College, London

Hydrocarbon reservoirs are geologically heterogeneous over a wide range of lengthscales. This heterogeneity is a key control on fluid flow during hydrocarbon production, because geological (sedimentary, structural and diagenetic) processes dictate the spatial distribution of petrophysical properties such as porosity, permeability, relative permeability and capillary pressure. These properties control the flow of oil, water and gas. Consequently, to understand, model and predict fluid flow, it is essential to understand and model geological heterogeneity. This is challenging for two reasons. The first is that geological heterogeneity is complex, ranging from the scale of individual pores (c. microns in length) to the scale of the entire reservoir (c. kilometres). The second is that subsurface data is limited. Well data has high spatial resolution but is sparsely distributed; seismic data is extensive but has low spatial resolution. Poor understanding of geological heterogeneity leads to increased uncertainty in predictions of hydrocarbon recovery, and increases the risk associated with hydrocarbon extraction.

Recognizing that a reservoir model cannot represent explicitly every type and scale of heterogeneity raises a number of persistent questions. What are the key types and scales of heterogeneity that models should capture? Are these key heterogeneities the same for all reservoir and hydrocarbon types, and all recovery processes? What is the minimum level of model resolution/complexity required to make recovery predictions that are 'good enough'? How should models best capture these key heterogeneities? To answer these questions requires the development of models based on rich datasets which capture heterogeneity at a high level of detail. Such models can be constructed using analogue outcrops. This presentation describes ongoing research to develop and apply outcrop analogue models, emphasizing the use of novel surface-based modelling techniques in conjunction with adaptive gridding/meshing for flow simulation, and the insight gained into the impact of geologic heterogeneity on flow.

The approach is illustrated using examples of shallow-marine sandstone reservoir analogues from three contrasting depositional environments across a hierarchy of lengthscales. The environments represented by the analogues comprise (1) a single, wave-dominated shoreface-shelf parasequence, (2) two stacked, fluvial-dominated deltaic parasequence sets and (3) multiple stacked, tide-dominated channel belts and tidal heteroliths. The datasets were obtained from well-exposed outcrops in Utah, USA, the Western Desert, Egypt and the Isle of Wight, UK; they describe reservoir architecture in generic analogues for many shallow-marine reservoirs. The model results demonstrate that subtle aspects of reservoir architecture, which are typically neglected in subsurface models, can have a significant impact on flow and hydrocarbon recovery. Conversely, features which are routinely included because they are easy to model may be unimportant to flow. New reservoir modelling methods are required to capture subtle, yet important, geological heterogeneities. The methods developed here to handle outcrop datasets are equally applicable to subsurface reservoirs. They rely less on grid- or pixel-based methods, and integrate better with a new generation of reservoir simulators.

Matthew D. Jackson received his Bachelor's degree in Physics from Imperial College London and his PhD degree in Geological Fluid Mechanics from the University of Liverpool. He then rejoined Imperial College as a Research Associate in the Department of Earth Resource Engineering (now the Department of Earth Science and Engineering) working on a multidisciplinary project to characterize the impact of geologic heterogeneity on production from complex tidal reservoirs. He is currently Senior Lecturer in Geological Fluid Mechanics and Reservoir Engineering. He established (with Dr. Gary Hampson) the Outcrop Modelling Group at Imperial College, which he still co-leads. He also established and leads the Smart Wells Group. Jackson has received the Brian Mercer Award for Innovation from the Royal Society, the 'Outstanding Associate Editor' award of the Society of Petroleum Engineers Journal, and (as co-author) the SEPM 'Excellence of Poster Presentation Award' at the 2010 AAPG/SEPM Annual Meeting. He has served on the board of the Petroleum Group of the Geological Society of London, and currently serves on the board of the London Section of the SPE. He is a member of the AAPG, SPE and AGU. He lives in London with his wife Liz and their son Nathaniel.

Social hour - 5:00 p.m.

Dinner - 6:00 p.m.

Program - 7:00 p.m.

Dinner will cost **\$35.00/person** in advance through **PAPGrocks.org./PayPal**; or **\$40.00/person** at the door, checks preferred. **Student cost is \$10.00. Reservations should be emailed to Christopher Willan at ecwillan@eqt.com**, please title as "PAPG/PGS Dinner Reservation." If you are unable to use email, call (412) 395-5525 and leave your name and number of reservations and meal selection needed by **noon, Friday, March 25.**

Dinner selections: Seared Chicken Cutlet layered with apples, onions and mushrooms with a marsala wine.
Parmesan Crusted Tilapia with a thyme cream sauce or a Vegetarian Option.

Meeting will be held at Radisson, Greentree, PA

STUDENT NIGHT CALL FOR ABSTRACTS!

Requested jointly by the societies of AEG, PGS and ASCE

Students are invited to submit abstracts of a Senior Research Project, Senior Design Project, Master's or PhD Thesis for presentation at the Ninth Annual Student Night joint meeting of the Association of Environmental & Engineering Geologists, the Pittsburgh Geological Society, and the Geotechnical Group of the Pittsburgh Section of the American Society of Civil Engineers.

Abstracts on the following topics are welcome: Geology, Engineering Geology, Geotechnical Engineering, Environmental Engineering, Hydrogeology, and Hydrology.

Each Society will select one abstract to be presented in a 15 minute oral presentation. Each of the 3 oral presentations will be given a \$100 award. Each Society will select one abstract to be presented as a poster presentation. Each of the 3 poster presentations will be given a \$50 award. All submitted abstracts not selected above are invited to be presented as a poster presentation. All students who present their research that night will receive a one year student membership in the Society of their choice, a special award certificate, and dinner that evening. Please limit abstracts to 250 words.

Meeting Logistics: Date: April 20, 2011 Time: 6:00 p.m. Location: Foster's Restaurant, Foster Plaza Bldg. 10, Greentree, PA
The due date for abstract submittal is Friday, March 11, 2011

Abstracts should be submitted via email to Nichole Wendlandt. If you have any questions please email Patrick Burkhardt, PGS, patrick.burkhardt@sru.edu, Nichole Wendlandt, AEG, at nwendlandt@GFNET.com, or Suresh Gutta, ASCE, SGutta@agesinc.com **Notification will be given to the selected speakers by March 25, 2011.**

CALL FOR NOMINEES

The Society is calling on the membership for interested candidates for next year's Officer and Director-at-Large positions.

There are 3 Director-at-Large positions that need to be filled. These positions are for a term of 2 years and require regular attendance at the Board meetings held 1 hour prior to the Social hour of each monthly Society meeting. The position requires that you become involved at some level in the monthly operations of the Society by aiding the Officers and Committees in various ongoing projects.

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 inform **Ray Follador**, Nominations and Elections Committee Chair, ASAP at 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

The name Cussewago is derived from a Native American phrase "Kos-se-waus-ga", which supposedly meaning "big belly". According to tradition, when the early Indians wandering through the area first arrived at a stream in what is now Crawford County, Pennsylvania, they found a large black snake with a white ring around its neck lying on a tree limb. The snake apparently had recently swallowed a rabbit or something of similar size, and the Indians took that as a sign for naming the stream. Cussewago Creek lends its name to the Late Devonian Cussewago Formation of northwestern Pennsylvania.

PGS SPRING FIELD TRIP 2011

PGS is considering a day-long field trip on April 16, 2011 to Johnstown, PA to tour areas impacted by Pennsylvania's most famous dam disaster, the Johnstown flood of 1889. In order for us to plan the trip efficiently, we need to know how

much interest there is in the trip. Anyone interested in attending the trip should respond to Judy Neelan at 412-442-4087, or email jneelan@state.pa.us, by March 18. The cost of the trip is \$20, which needs to be prepaid once we determine that we have enough interest to move forward with the field trip.

The history and geology of the Johnstown flood will begin with stops at the Johnstown Flood National Memorial near South Fork, followed by a tour of St. Michaels, the village now occupying the site of the lakeside cottages and clubhouse on Lake Conemaugh, and an up-close look at the remains of the South Fork dam. We will then travel into Johnstown and board the nation's steepest vehicular inclined plane for a ride to the top of the hill. In addition to a breathtaking and revealing view of Johnstown, the story of how the catastrophe unfolded will be told. Our last stop will be the cemetery where the remains of the unknown victims rest.

PGS Website of the Month

<http://ostseis anl.gov/index.cfm>

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name Column.

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. Be sure to also send an email address and phone number where you may be contacted.

PGS Website: To contact the Webmaster, Mary McGuire, with questions or suggestions, please either email marymcguire@comcast.net or use the site's "Contact Us" link at www.pittsburghgeologicalsociety.org.

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

Officer Contacts: If you wish to contact a current PGS Officer, please call or email Mary Ann Gross, President, at 724 873-3221 / magrs@yahoo.com or mgross@rangeresources.com; Patrick Burkhart, Vice President, at 724 738-2502 / patrick.burkhart@sru.edu; Steve McGuire, Treasurer, at 412 809-6723 / smcguire@chesterengineers.com; William Gould, Secretary, at 412 389-2859 / wvgould@wwgeosciences.com.

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email [at patrick.burkhart@sru.edu](mailto:patrick.burkhart@sru.edu).

PGS CORPORATE SPONSORS

ABARTA Oil & Gas Co., Inc.
ACA Engineering, Inc.
American Geosciences, Inc.
American Geotechnical &
Environmental Services, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
Benedum Interests
Billman Geologic Consultants, Inc.
Civil & Environmental Consultants,
Inc.
Cummings/Riter Consultants, Inc.
DiGioia, Gray & Associates, LLC
Dorso LP
Groundwater & Environmental
Services, Inc.

Hetrick Mfg. Inc.
Highpointe Oil & Gas, LLC
Howard Concrete Pumping Company,
Inc.
Huntley & Huntley, Inc.
Key Environmental, Inc.
Moody and Associates, Inc.
Natural Energy Development Corp.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
Rosebud Mining Co.
Seneca Resources Corporation
Texas Keystone, Inc.
THG Geophysics, Ltd.
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 8

Robert Botterman, Editor

April, 2011

Wednesday, April 20, 2011

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

9th Annual Student Night

Sponsored by Pittsburgh Geological Society

**"VEIN STRUCTURES AND FAULTS IN CORE SAMPLES FROM IODP EXPEDITION 315,
SITES C0001 AND C0002, NANKAI TROUGH, JAPAN"**

By Matthew R. Harding and Jonathan C. Lewis

Cores retrieved from Sites C001 and C0002 during Integrated Ocean Drilling Program (IODP) Expedition 315 offshore SW Japan provides an excellent opportunity to examine deformation across the Nankai Trough. Historically, this region is well known for its great (magnitude >8) earthquakes. On-board core logging and analysis of X-ray computed tomography scans revealed numerous core-scale deformation structures. These structures include faults, vein structures, kind bands, deformation bands, brecciated horizons, shear zones and rare folds. Here we document the geometries and textural characteristics of faults and vein structures, using microscope observations and petrographic analyses. The faults typically occur as isolated structures whereas the vein structures typically occur in groups of three or four. At Site C0001 these structures occur in zones with abundant faults and shear zones as noted during on-board core logging, and mostly occur below an m-scale thick zone of breccia encountered at ~220 meters below the sea floor. A single sample from C0002 displays particularly well-preserved cross-cutting relations between several faults. Preliminary analyses suggest that the steeper dipping (>60°) faults are older than the shallower dipping (~45°) faults. These findings are being examined in the context of fault kinematic data obtained from core observations during the expedition in hopes of shedding light on the sequence of faulting within the accretionary wedge. Understanding how these deformation structures might fit into the earthquake cycle remains an important goal of our IODP efforts.

**Two additional talks will be sponsored by the Association of Engineering Geologists,
and the American Society of Civil Engineers (Abstracts on their respective websites)**

Social hour - 6:00 p.m.

Dinner - 7:00 p.m.

Program - 8:00 p.m.

Dinner will cost \$25.00/person, students \$5.00; checks preferred. Reservations should be emailed to Steve McGuire at smcguire@chesterengineers.com, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, April 18.**

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

In addition, the PGS will recognize two student posters:

LIFTING OF THE CLAST BY WATER AND ICE: AN EXPLANATION FOR THE TRAILS OF THE RACETRACK AND BONNIE CLAIRE PLAYAS

RYAN, Andrew J.(1), KLETETSCHKA, Gunther (2), MCKINNEY, Emerald (3),
MCINTIRE, Leva (4), FERCANA, George (5), SCHWEBLER, Kristopher (6),
ROMINE, Gregory (7), JACKSON, Brian (2), CHEUNG, Cynthia (2), and PARSONS, Ann (2):

- (1) Geography, Geology, and the Environment, Slippery Rock University, Slippery Rock, PA 16057, ajr2727@sru.edu,
(2) NASA, Goddard Space Flight Center, Greenbelt, MD 20706, (3) Massachusetts Institute of Technology, Cambridge, MA 02139,
(4) Seattle Pacific University, Seattle, WA 98222, (5) Clemson University, Kingstree, SC 29556,
(6) Cornell University, Ithaca, NY 14853, (7) San Francisco State University, San Francisco, CA 94132

The sliding rocks of the Racetrack and Bonnie Claire playas have puzzled researchers for nearly a century. Rock fragments seem to race over a desiccated layer of sediment in the desert of Death Valley, California, leaving only their infamous trails as proof of their enigmatic movement. Interestingly, no one has ever witnessed the movement of these rocks. Furthermore, the mechanism responsible for moving the rocks and creating the trails has not yet been fully explained. A series of observations and measurements of this phenomenon at Racetrack and Bonnie Claire were conducted by NASA's Lunar and Planetary Science Academy interns, and coordinating NASA researchers, in June, 2010. The dolomite and granite rocks have masses ranging from 0.5 kg to 300 kg. The trails are parallel on occasion, but are more commonly chaotic, with some as long as 0.5 km. Each rock has a mound of raised clay on one side and a trail depression on the other. A number of trails have no rocks at the end, with only a mound of solid clay where a rock once could have rested. Analysis of trail width and length measurements has revealed that the trails often widen towards the distal end of the trail. Additionally, some trails are much wider than their associated rock, while others are much narrower. Field observations and measurements of the moisture content and temperature of the sediment point towards a unique mechanism, involving increased buoyancy, and possible rock uplift through a combination of water influx and "ice collar" formation. Additionally, miniature icebergs floating over the playa may have created some trails without rocks, during hydroperiods with ponded water.

PETROGRAPHIC CHARACTERIZATION OF DEFORMATION MECHANISMS AND KINEMATICS IN POST-CLEAVAGE FAULTS ACCOMMODATING DIFFERENTIAL UPLIFT OF THE HSUEHSAN RANGE: TAIWAN

Smith, Mark, Geoscience, Indiana University of Pennsylvania, 663 Locust St. Indiana PA 15701

West-central Taiwan is thought to be the site of a relic passive margin fracture zone that is controlling the contemporary uplift patterns of the Hsuehshan Range. We focus on microstructures within an oriented sample to identify the primary deformation mechanisms and kinematics. We found an abundance of clasts showing cataclasis while observing the deformation at grain scale. Our observations of the asymmetric microstructures are also consistent with the kinematics of the system observed in the field. The focal point of our study is a single fault within a suite of recently recognized northwest-striking faults just southwest of the Hsuehshan Range. Thin sections were made normal to the fault plane and both parallel and perpendicular to the slip direction. The bulk of the faults are north-northeast dipping oblique thrust faults with the maximum shortening direction to be southwest and northeast. These post cleavage faults trend nearly normal to a northeast trending regional magnetic high that is believed to mark the edge of full-thickness continental crust. This offset nearly conforms with the topographic break that separates the higher Hsuehshan Range to the northeast from the lowlands of the Puli Basin to the southwest. We infer it to be the northeast facing margin of what appears to be a promontory in the lower plate pointing to the east. This promontory of continental crust in the footwall is now acting as a deformation guide as the trench-fill sediments making up the orogen move northwest in response to collision with the Luzon arc.

Additional student posters will be sponsored by the Association of Engineering Geologists, and the American Society of Civil Engineers (Abstracts on their respective websites)

NORTH AMERICAN COALBED METHANE FORUM – SPRING SESSION APRIL 19 AND 20, 2011

The North American Coalbed Methane Forum will hold its spring session April 19 and 20, 2011 at the Hilton Garden Inn at Southpoint near Canonsburg, PA. The Forum will consist of presentations covering technical, regulatory and legal aspects of coalbed methane development and production. Attendees will be eligible for six (6) Professional Development Hours (PDH). For information please contact Ihor Havryluk at 412-445-5803, harvyluk@zoominternet.net, or Dr. Kashi Amininan at 304-293-7682, Khashayar.amininan@mail.wvu.edu

CARNEGIE SCIENCE CENTER 72nd PITTSBURGH REGIONAL SCIENCE AND ENGINEERING FAIR April 1, 2011

Awards Presented By The Pittsburgh Geological Society

The Pittsburgh Geologic Society is pleased to announce the winners of our awards at the Carnegie Science Center Pittsburgh Regional Science Fair held on April 1, 2011 at Heinz Field. The PGS has been a long time sponsor of awards at the Science Fair. The PGS sponsored two awards. This year, both award winners were in the Intermediate (Junior High) Division. In evaluating student projects, the PGS judges considered the relevance of the project to the core scientific disciplines represented in the PGS, the manner in which the student followed the scientific method in the experimental design, conduct, evaluation of the results, and overall knowledge of the subject. The PGS judges were Lisa Whited, Mike Bikerman, and Steve McGuire. This year the judges faced a happy dilemma where all Divisions had multiple excellent projects that directly addressed geology, geochemistry, the geologic basis of environmental problems, and earth materials.

INTERMEDIATE DIVISION

An Intermediate Division award was presented to Andrew Doyle of Wexford, PA, who is in the 7th Grade at Eden Christian Academy. The title of Andrew's project was "Gravity – That's How it Rolls". The project involved an investigation of how the properties of different materials contribute to their slope stability failure. Andrew's interest in this subject was stimulated by the recent news reports of the serious landslides in Brasil. The slope failure angle of four different sieve sizes of sand was determined under dry and wet conditions. Of particular interest was the excellent research notebook and the many nicely hand drawn sketches of the various aspects of his research methods. During the interview with the PGS judges, Mr. Doyle demonstrated a good understanding of his research subject which he had developed with limited outside mentoring. His teacher sponsor was Mrs. Berkley.

INTERMEDIATE DIVISION

The second winner in the Intermediate Junior High Division award was Adriana (Annie) Fratz of Accident, MD, who is in the 8th grade at Northern Middle School in Accident, MD. The title of the project was "Oil Spill solutions". Annie's interest in how best to clean up oil spills comes from the farm where she lives. Small leaks and spills are inevitable when working with farm equipment and Annie wanted a practical demonstration of the effectiveness of different materials. Sawdust, sand, cat litter, polypropylene pad, and cotton batting were tested for their ability to absorb motor oil. The project was nicely documented and Annie provided an engaging interview with the judges. The teacher sponsor for the project was Mrs. Georg.

DID YOU KNOW . . . ?

- A team of astrophysicists from Princeton University has discovered the first-known carbon-rich planet outside our solar system, orbiting a star 870 light-years away
- If you happen to be looking to buy some land, forget the Brooklyn Bridge or that swampland in Louisiana – a couple of enterprising U.S. citizens have some to sell you on eBay. The land, however, happens to be on Gliese 581g, a distant planet that may or may not be Earth-like.
- Because natural electromagnetic radiation (EMR) impulses are emitted from rocks under stress, measurements of EMR can be used to detect faults and bedding surfaces.
- Based on data from more than 1,000 meteorological stations worldwide and satellite observations of sea-surface temperatures, 2010 tied 2005 as the warmest year on record since recording began in 1880.
- Scientists believe that gold, platinum, and other metals found in the Earth's crust and mantle were brought to Earth by a few large asteroids after the planet's iron-rich core was formed.
- Diabase is a mafic rock that is believed to have formed from magma originating in the mantle.
- Since *Archaeopteryx* is considered to be just another feathered dinosaur, the "official" first bird is now *Confusiusornis*, a crow-sized, toothless, tail-less species from China.

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name Column.

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. Be sure to also send an email address and phone number where you may be contacted.

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

PGS Board-of-Directors

President: Mary Ann Gross
Vice President: Patrick Burkhart
Treasurer: Steve McGuire
Secretary: Bill Gould
Past President: Mike Forth

Director-at Large: Danielle Deemer
Director-at Large: Maury Deul
Director-at Large: Ray Follador
Director-at Large: Erica Love
Director-at Large: Barbara Hamel

Director-at Large: Albert Kollar
Counselor: John Harper
Counselor: Mary Robison
Counselor: Charles Shultz

Other PGS Positions

AAPG Delegate: Dan Billman
Newsletter Editor: Robert Botterman

Webmaster: Mary McGuire

Historian: Judy Neelan

Officer Contacts: If you wish to contact a current PGS Officer, please call or email Mary Ann Gross, President, at 724 873-3221 / magrs@yahoo.com or mgross@rangeresources.com; Patrick Burkhart, Vice President, at 724 738-2502 / patrick.burkhart@sru.edu; Steve McGuire, Treasurer, at 412 809-6723 / smcguire@chesterengineers.com; William Gould, Secretary, at 412 389-2859 / wvgould@wwgeosciences.com.

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email [at patrick.burkhart@sru.edu](mailto:patrick.burkhart@sru.edu).

PGS CORPORATE SPONSORS

ABARTA Oil & Gas Co., Inc.
ACA Engineering, Inc.
American Geosciences, Inc.
American Geotechnical &
Environmental Services, Inc.
Ammonite Resources
Anschutz Exploration Corp.
ARK Resources, Inc.
Benedum Interests
Billman Geologic Consultants, Inc.
Civil & Environmental Consultants,
Inc.
Cummings/Riter Consultants, Inc.
DiGioia, Gray & Associates, LLC
Dorso LP
Groundwater & Environmental
Services, Inc.

Hetrick Mfg. Inc.
Highpointe Oil & Gas, LLC
Howard Concrete Pumping Company,
Inc.
Huntley & Huntley, Inc.
Key Environmental, Inc.
Moody and Associates, Inc.
Natural Energy Development Corp.
Pennsylvania Drilling Co.
Pennsylvania Soil and Rock, Inc.
Rosebud Mining Co.
Seneca Resources Corporation
Texas Keystone, Inc.
THG Geophysics, Ltd.
URS Corporation
Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209



PGS Newsletter

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

Vol. LXIII, No. 9

Robert Botterman, Editor

May, 2011

Wednesday, May 18, 2011

The Pittsburgh Geological Society presents

***Land-Ocean-Atmosphere Connections:
Controls on the Flux and Fate of Terrigenous Sediment in the Coastal Ocean***

Katie Farnsworth, PhD, Indiana University of Pennsylvania, Dept. of Geoscience

Rivers provide the primary link between land and sea, annually discharging about 36,000 km³ of freshwater and approximately 18 x 10⁹ tons of solids to the global coastal ocean. Together with geomorphology and oceanographic setting, rivers help determine the character of the estuarine and coastal environment. Although discharged fluvial water and sediments are generally confined to the coastal zone, if the river is sufficiently large (e.g., the Amazon) or the shelf sufficiently narrow (e.g., western Java) plumes of sediment and water can travel to or beyond the shelf edge. The fate of the discharged material is important for understanding coastal sedimentary environments as well as playing a key role in the cycles of both carbon and pollutants introduced through this pathway. Case studies involving orders of magnitude differences in spatial scale (from a small mountainous watershed to global sediment delivery patterns) will illuminate the complexity of these sediment delivery and storage systems.

The first case study will look at small watersheds on the west coast to show the role that local and regional controls play on sediment delivery and fate. The majority of sediment introduced into the coastal waters of the U.S. West Coast comes from these small rivers draining coastal mountains which are episodic in nature and the delivery of freshwater and sediment is strongly controlled by storm frequency and intensity. The fate of the sediment in the coastal oceans is controlled by hydrographic processes acting to disperse the sediment on the water surface (buoyant plumes), within the water column (suspended sediment) and near the seafloor (dense underflows).

The second case study will look at sediment delivery on a much larger scale, investigating the global patterns of sediment flux. The estimation of sediment flux on such large scales is inherently fraught with errors, but patterns can be seen in freshwater discharges that are more robust. Determining the annual mean estimates of sediment and freshwater flux to the coastal ocean allows us to quantify changes that are occurring over short time scales due to the rapidly changing global environment. This talk will showcase some of our work currently being done to understand the flux and fate of terrigenous sediments in the coastal oceans and changes in spatial and temporal patterns over the past few decades.

Katie Farnsworth, Ph.D. - Assistant Professor, Dept. of Geoscience, Indiana University of Pennsylvania. Dr. Farnsworth received a B.A. in Geography and Computer Science from DePauw University (1993) and her M.S. (1997) and Ph.D. (2003) in Marine Science from College of William and Mary, School of Marine Science. Current projects include: Controls on the flux and fate of sediment from the west coast of the US: ongoing projects all along the West Coast of the US, IUP Watershed Web Portal to educate the local public on water quality issues in local waterways, and Changing shorelines of Lake Ontario and the Exploration for Shipwrecks from the War of 1812.

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**, please title as "PGS Dinner Reservation." If you are unable to use email, call (412) 809-6723 and leave your name and number of reservations needed by **noon, Monday, May 16**.

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

WE NEED A MEMBER TO STEP FORWARD TO RUN AS TREASURER! THIS HAS BECOME A SERIOUS PROBLEM FOR THE SOCIETY. PLEASE CALL TO DISCUSS WHAT THE JOB REQUIRES – IT'S NOT AS TIME CONSUMING AS YOU MIGHT THINK.

Thank you,
Mary Ann Gross, President & past Treasurer
magrs@yahoo.com
724 873-3221 office
412 721-3499 cell
Ray Follador,
Chairman – Election Committee & past Treasurer
geodawg@comcast.net
724 744-0399
Steve McGuire,
Treasurer 2010-11
smcguire@chesterengineers.com,
412 809-6723

THE CLOSE OF ANOTHER YEAR

Hope you have enjoyed the many events offered this year. In particular the highly successful NE-GSA convention, the diverse topics covered by the monthly speakers and the special jointly sponsored Student Night, the memorable spring field trip to Johnstown in April, and the variety of other activities. Take a look at the renovated PGS Website! An on-line site for ordering tee-shirts, hats and other items adorned with the PGS logo is being set up. Watch for details in future emails. The elected Board, Committee Chairs and Volunteers, all with careers and lives outside of PGS, have accomplished much for its Members. I am sure all join in a collective thank you for their efforts.

PGS celebrates its 66th anniversary this year. As of this date, there are 178 regular members, 58 student members, and 22 honorary members. We especially thank the 31 new and renewing Corporate Members – listed in each Newsletter. They have contributed over \$3,700 to our Society! Many members volunteered their services to the public this year as speakers, field trip leaders and providers of information. This Society can make a lot happen when called upon – really! It makes a difference and it takes the Members to keep it going. Just ask the students you see at the meetings or other events, or talk to the members who've judged the Carnegie Science Fair over the years.

This September begins a new season – what do you want to see? Do you have ideas for Workshops or Seminars? Do you belong to a different Society you'd like to see jointly sponsor a meeting or activity with

PGS? Let the Board know. We are always available.

Thank you for the opportunity to serve as President this year. It was an honor. Happy Summer!
Mary Ann

FIELD TRIP REPORT - JOHNSTOWN FLOOD MUSEUM AND DAM SITE

Dan Martt and Rick Barringer attended the Pittsburgh Geological Society field trip entitled, "The Johnstown Flood, May 31, 1889." The trip was created to acquaint the attendant of the geology and history of the catastrophic flood that almost wiped out the city of Johnstown on the date above. In addition to visiting the Johnstown Flood National Memorial near St. Michaels, Pennsylvania, the attendants were given a talk by Drs. Uldis Katkins, Carrie Davis Todd and Neil Coleman, all of University of Pittsburgh, Johnstown (UPJ) (Dr. Katkins is an emeritus professor) on their research, "Influence of Modifications to the South Fork Dam on the Johnstown Flood of 1889" at the actual dam site. The talk, carried out in a driving rainstorm, emphasized the problems caused by the modifications to the original dam (built for the Pennsylvania Canal system almost 40 years earlier) by the South Fork Hunting and Fishing Club. In addition to determining the volume of water in the dam and the amount discharging at the time of failure, they are interested in determining if the dam would have survived had the design modifications not taken place. The American Society of Civil Engineering published a report in Engineering Record in 1891 stating the modifications did not cause the dam to fail and the flood would have happened anyway. The group from UPJ hopes to publish their results later this year. One interesting feature of the old dam observed were the old foundation stones for the inlet tower, still in place after more than 140 years. The UPJ group is using the stones as a GIS benchmark for mapping, from which further research could be carried out.

Further field trip stops dealt with the history of Johnstown, including the times of boat building, canal port and coal and iron mining center, including the steel making which was pioneered in Johnstown. We had an eagle eye view of the city from the top of the world's steepest inclined railway, which also carried our vehicles to the top. The stops included a viewing of the Plot of the Unknowns at Grandview Cemetery, where unidentified bodies found after the flood were buried in rows; a sobering sight for anyone involved in works involving the safety of the public. We also

viewed flood control walls constructed in the 1930's at the "Point" (confluence of the South Conemaugh and Stony Creek rivers).

Dr. Chuck Shultz, retired geology professor from Slippery Rock University, gave interesting geological background for the field trip, and Frank Benacquista supplied copies of the old Johnstown U.S.G.S. Folio as part of the background.

PGS AWARDS

At the April Meeting the Awards Committee presented and the Board voted to award the **Walt Skinner Award** to **Steve McGuire** for his long term of service as Treasurer and for volunteering his time and efforts for numerous other positions in PGS over the years, in particular for serving as one of the lead judges for the Carnegie Science Fair. Steve has been a tireless supporter of our student membership.

John Harper was awarded **Honorary Membership** for his numerous years of service to PGS. He has authored many articles and field guides, and has written "Origins of Western PA Place Names" for the PGS Newsletter since February, 2003. The sharing of his vast knowledge of geology and its history has enriched PGS members significantly.

CONGRATULATIONS TO BOTH AWARDEES!

ORIGINS OF WESTERN PA PLACE NAMES

The town of Corry in eastern Erie County, Pennsylvania, was named for Hiram Corry. Corry owned the land where the Sunbury and Erie Railroad intersected the Atlantic and Great Western Railroad, and the ensuing station was named in Corry's honor in 1861. As luck would have it, an oil refiner from Boston named Samuel Downer was looking for a place to build a refinery near the newly discovered oil fields in Venango and Warren Counties that had good transportation facilities. He bought fifty acres from Corry, laid out the tract in lots, and built the Downer and Kent Oil Works. Soon afterward, the area had two hotels, several factories, a post office, residences, and stores, all because the oil business brought great prosperity to the area. Twenty years later, I. C. White described and named the Corry Sandstone for a light-colored Upper Devonian rock quarried about one mile south of the town.

DID YOU KNOW . . . ?

- Base on paleotemperatures measured in belemnites and oysters, the Jurassic Period was marked by numerous climate changes.

- At many subduction zones, excess pore pressures commonly develop in accretionary complexes as low-permeability marine sediments undergo rapid, tectonically-driven loading.
- Scientists have found and recorded the first instances of antimatter forming on Earth during terrestrial gamma-ray flashes in thunderstorms.
- A new study suggests that invasive species might have been responsible for the Late Devonian mass extinction event.
- Ooid tidal deltas form where lateral flow is restricted because of the presence of islands, and tidal currents are concentrated through the channels.
- On average, two new impact craters are found on earth every year, typically by exploration geologists using seismic data.
- The value of the US's non-fuel mineral production rose 9 percent in 2010, after a decline in 2009.
- The three large seismically active intraplate areas in eastern North America, the Mississippi Valley near New Madrid, Missouri, the St. Lawrence Valley in eastern Canada, and Charleston, South Carolina, all were once mid-continental rift zones.
- A new study suggests that the amount of desert dust in Earth's atmosphere doubled over the last century, which may actually be slowing global warming a bit.
- An iceberg the size of Luxembourg struck Antarctica's Mertz Glacier in February 2010 and shaved off a new iceberg measuring 48 miles long and 24 miles wide. That much ice holds the equivalent of 1/5 of the annual water usage of the planet.

PGS Website of the Month

<http://www.geus.dk/program-areas/raw-materials-greenland/greenland/gr-map/anhstart-uk.htm>

If you have news items you would like included in the PGS newsletter, please send them to Bob Botterman at rbottgeo@aol.com. Special thanks to all who contributed newsletter items this season—especially to John Harper who writes the Western PA Place Name Column.

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. Be sure to also send an email address and phone number where you may be contacted.

PGS Board-of-Directors

President:	Mary Ann Gross	Director-at Large:	Danielle Deemer	Director-at Large:	Albert Kollar
Vice President:	Patrick Burkhart	Director-at Large:	Maury Deul	Counselor:	John Harper
Treasurer:	Steve McGuire	Director-at Large:	Ray Follador	Counselor:	Mary Robison
Secretary:	Bill Gould	Director-at Large:	Erica Love	Counselor:	Charles Shultz
Past President:	Mike Forth	Director-at Large:	Barbara Hamel		

Other PGS Positions

AAPG Delegate:	Dan Billman	Webmaster:	Mary McGuire	Historian:	Judy Neelan
Newsletter Editor:	Robert Botterman				

Officer Contacts: If you wish to contact a current PGS Officer, please call or email Mary Ann Gross, President, at 724 873-3221 / magrs@yahoo.com or mgross@rangeresources.com; Patrick Burkhart, Vice President, at 724 738-2502 / patrick.burkhart@sru.edu; Steve McGuire, Treasurer, at 412 809-6723 / smcguire@chesterengineers.com; William Gould, Secretary, at 412 389-2859 / wvgould@wvgeosciences.com.

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@state.pa.us. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting, please contact Patrick Burkhart, Program Chair at (724) 738-2502 or email at patrick.burkhart@sru.edu.

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

PGS CORPORATE SPONSORS

ABARTA Oil & Gas Co., Inc.	Hatch Mott MacDonald, Inc.
ACA Engineering, Inc.	Hetrick Mfg. Inc.
American Geosciences, Inc.	Highpointe Oil & Gas, LLC
American Geotechnical & Environmental Services, Inc.	Howard Concrete Pumping Company, Inc.
Ammonite Resources	Huntley & Huntley, Inc.
ARK Resources, Inc.	Key Environmental, Inc.
Benedum Interests	Moody and Associates, Inc.
Billman Geologic Consultants, Inc.	Natural Energy Development Corp.
Civil & Environmental Consultants, Inc.	Paul C. Rizzo Associates Inc.
Cummings/Riter Consultants, Inc.	Pennsylvania Drilling Co.
DC Energy Consultants	Pennsylvania Soil and Rock, Inc.
	Rosebud Mining Co.
DiGioia, Gray & Associates, LLC	Seneca Resources Corporation
Dorso LP	Texas Keystone, Inc.
Groundwater & Environmental Services, Inc.	THG Geophysics, Ltd.
	URS Corporation
	Vista Resources, Inc.

PITTSBURGH GEOLOGICAL SOCIETY
PO Box 58172
Pittsburgh PA 15209