Dear Fellow Coal Geology Division Members:

Greetings! The spring 2010 newsletter has information regarding the upcoming 2010 GSA Annual Meeting and other upcoming geological meetings; the Ohio Valley Organic Petrographers meeting held this past March, an article about reclamation in Kentucky, and a book about coal fires that will be available this summer.

I appreciate the assistance I received from members, fellow officers, and GSA staff with the Fall 2009 and Spring 2010 Newsletters. Please contact me if you have suggestions or comments regarding the newsletter, or if you would like to contribute information regarding coal-related research or projects, meetings, awards, photos, and other activities or information. I look forward to hearing from you and welcome your insight and contributions.

We received our quarterly financial statement in April. There is a net loss of $278.06 because our dues income was less than our expenses. Our total assets equal $6,237.97.

The Coal Geology Division officers hope to see you at the 2010 Annual GSA meeting in Denver. This year the CGD will have a poster for the annual meeting. If you have suggestions for the poster, please contact me.

Thank you,

Sarah Shearer
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Here’s a quick update on the coal sessions that are currently scheduled for the GSA Annual Meeting in Denver. We hope to see you there!

“Advances in Clean Coal Technology, Carbon Sequestration, and Enhanced Resource Recovery”
Conveners: Jack C. Pashin, Stephen F. Greb
Sponsors: GSA Coal Geology Division; GSA Geology and Society Division
Summary: This session examines advances in clean coal technology, including geologic carbon sequestration and enhanced oil and gas recovery. The environmental impacts of greenhouse gas emissions and carbon capture and storage programs are considered.

Scientific Categories: Coal Geology; Environmental Geoscience; Public Policy

“Frontiers in Coal Science: Basic Research to Applied Technology”
Conveners: Sharon M. Swanson, James C. Hower
Sponsors: GSA Coal Geology Division; GSA Sedimentary Geology Division
Summary: This session highlights recent advances in coal science. Topics include environmental effects of coal utilization, characterization of coal combustion products, coal gasification/liquefaction, coal bed methane, economics of coal use, carbon sequestration, coal petrology, and sedimentology.

Scientific Categories: Coal Geology; Environmental Geoscience; Sediments, Clastic

2010 Meetings:

2010 Geological Association of Canada/Mineralogical Association of Canada Annual Meeting May 10-13, 2010, Calgary, AB, Canada

Interstate Oil and Gas Compact Commission, May 23-25, Lexington, KY

2010 Cordilleran GSA Section Meeting; May 27-29, Anaheim, CA

2010 Clay Societies Meeting June 6-11, 2010, Madrid and Seville, Spain
www.sea-arcillas.es/2010TMC


2010 The Palynological Society (AASP) Meeting (convened with CAP and CPC), September 29-October 1, 2010, Halifax, Nova Scotia

2010 Annual Geological Society of America Meeting October 31-November 3, 2010, Denver, Colorado

Future Geological Society of America Annual Meetings:

Minneapolis, Minnesota, October 9-12, 2011

Charlotte, North Carolina, November 4-7, 2012

Denver, Colorado, October 27-30, 2013

Vancouver, British Columbia, Canada, October 19-22, 2014
The lower Ohio Valley states of Kentucky, Indiana, and Illinois have at least nine locations where organic petrographers are employed. Typically, the petrographers do not all attend the same professional meetings or are confined by the short times allotted for their talks. In an attempt to get the regional petrographers in the same place at the same time, a regional colloquium was held at the Henderson office of the Kentucky Geological Survey of 31 March 2010. The first meeting of the group provided an opportunity for professionals to give longer and more informal presentations and, in some cases, very early versions of experiments in progress. The colloquium also served as a forum for students to present their research results and a venue for all in attendance to freely comment on the presentations without the constraints of a time keeper.

Our host, Dave Williams, started the meeting with an overview of the activities of the Kentucky Geological Survey in western Kentucky. The planning, drilling, and testing of the 2440-m Blan well in Hancock County, KY, has dominated their work for the past 30 months. In this test, supercritical CO$_2$ was injected into the Ordovician Knox formation carbonates in order to test the formation’s capacity for CO$_2$ sequestration. Maria Mastalerz and Agnieszka Drobnia, Indiana Geological Survey, and Cortland Eble, Kentucky Geological Survey, returned to the subject of CO$_2$ sequestration throughout the day with their reports of studies in Illinois, Indiana, Kentucky, and Virginia.

Jen O’Keefe, Morehead State University, gave two presentations on behalf of her undergraduate students. In one study, Jen and her students have been following the reconfiguration of the Morehead State University steam plant before and after US Environmental Protection Agency directives to eliminate the fly ash emissions from the plant. In another study, she has been directing an investigation of several coal fires in eastern Kentucky. Along with USGS and UK CAER collaborators, and with co-investigators across the US, they have been revisiting one of the fires in order to learn more about temporal variations in the emissions. In addition, they have experimented with a number of different instruments for measuring emission gases, including techniques to gather continuous measurements of T and CO over the course of several weeks.

The remaining presentations dealt with the origin of inertinite in coal. At one end of the rank scale, O’Keefe showed the fungal damage to wood buried in a compost pile for five years and made comparisons to similar features found in coals. Allison Richardson and Anne Satterwhite, University of Kentucky Department of Earth & Environmental Sciences MS candidates, discussed the nature of inertinites in the splint coals of eastern Kentucky and in the Stephanian coals of western Kentucky, respectively. The splint coals are marked by abundant unstructured inertinites, often part of detrital assemblages. The Stephanian coals originated from a floral assemblage quite different from the arborescent Lycopod-dominated flora of the underlying Asturian coals. Jim Hower, UK CAER, closed the program with a discussion of the complex origin of detrital macerals and unstructured inertinites, often in juxtaposition, in a variety of coals.
Group picture (from left): Dave Williams (Kentucky Geological Survey), Jim Hower (University of Kentucky CAER), Cortland Eble (KGS), Ken Kuehn (Western Kentucky University), Maria Mastalerz (Indiana Geological Survey), Jen O’Keefe (Morehead State University), Sharon Swanson (U.S. Geological Survey), Adam Layne¹ (MSU), Anne Satterwhite² (CAER & University of Kentucky Earth & Environmental Sciences), Agnieszka Drobiak (Indiana Geological Survey), Allison Richardson² (CAER & UK EES), Rachel Hatch¹ (CAER & UK EES), Penny Meighan³ (Indiana University)

¹ – Undergraduate student; 2- Graduate student MS; 3- Graduate student PhD

Maria Mastalerz, Indiana Geological Survey, speaking about IGS CO₂ sequestration programs.

Rachel Hatch, Allison Richardson, and Anne Satterwhite, all University of Kentucky Department of Earth & Environmental Sciences students, prior to the opening of the colloquium.

The photos from the Ohio Valley Organic Petrographers Meeting are courtesy of James C. Hower.
Beginning in the 1950s, approximately 312 acres of land located in southwestern Daviess County, Kentucky, along Hwy 554 near Brush Creek, endured extensive coal mining and processing activities. Panther Quad topographic maps show strip mine activity with photographic imagery dating back to 1950. Specifically, the Green Coal Company, Inc. operated here from 1961 until it became defunct and the company’s reclamation bond was forfeited on March 26, 1998. Mining spanned the pre-law and post-law eras. KY-Office of Mine Safety and Licensing reported coal tonnage from the Green Coal Company K-9 mine complex located on the land as averaging over 900,000 tons of coal each year from 1961-1981. The K-9 mining areas of increments #1 and #2 on forfeited permit 830-8003 were extensively pock marked with water bearing strip pits, some extending 500’ in length. Increment #1 consisted of a strip mine area, prep plant and tipple. Increment #2 was comprised of a strip mine and slurry pond. On February 6, 2008, the Kentucky Division of Abandoned Mine Lands began its reclamation efforts on the land. The Panther Reclamation Project consisted of three contracts: Panther Tipple I, Panther Tipple II, and Panther Pits AMD and was collectively completed on October 8, 2009. The project addressed the pre-law and post-law affects of mining and processing that occurred at the historic K-9 mine complex on site.

Project land and waters were negatively affected by past coal mining and resultant acid mine drainage. Due to the coal processing that occurred on site, much of the area, over 100 acres, was covered in toxic refuse and slurry and included scattered water impoundments, some of which contained significant acid mine drainage. The area also contained much scattered garbage and mining debris, including abandoned mining equipment. Specifically, a long pit impoundment at the western boundary of the area included a 40’ highwall. Acidic runoff from the project area contributed significant amounts of sediment to Brush Creek increasing the potential for localized flooding. The pH readings taken of the area were highly acidic and measured in the 2-3 range. Downstream cattle operations were adversely affected by the water pollution and a strong sulfuric acid odor was noticeable throughout the area.

The Panther Tipple I contract project work consisted of clearing and grubbing the cover material borrow area in preparation for the larger reclamation project planned for the immediate future. Since the project area contained many scaly barked trees it was classified by the U.S. Fish and Wildlife Service as a potential Indiana bat habitat. Therefore, DAML removed the trees during the winter tree clearing window allowed under USFWS guidelines.

The Panther Tipple II contract consisted of one reclamation site and three cover material harvesting areas with a total of 172.5 acres reclaimed. The main component of the reclamation on contract II was refuse earthwork/gradework which required grading 172.5 acres, eliminating all large and small gullies, treating and draining four acidic impoundments totaling 17 acres, redirecting drainage patterns and providing a smooth, positive drainage surface to enable revegetation efforts.

The third contract, Panther Pits AMD, continued the reclamation work of Panther Tipple II with a total of 45 acres reclaimed. Specifically, a pit consisting of five acres of surface water was treated. Contractors cleared brush and timber on the spoil side of a water filled pit to allow fill material to be pushed/hauling into the pit. The pit and highwalls were then backfilled to a 4:1 slope using onsite pre-law spoil materials and agricultural limestone was added to the pit for treatment. Prior to releasing, on-site acidic waters were treated to obtain a 6.5pH level.
Established drainage tied into the existing ditches constructed during the Panther Tipple II contract. Silt control bales and rock checks were installed to control erosion. The entire project area was revegetated.

Panther Reclamation Project landscape conforms to the natural environment of other rural areas in Daviess County, KY. Land is now suitable as farmland for agricultural use and pasture for livestock grazing. The landscape blends well into other surrounding area rolling-hill farmlands.

The project also eliminated various hazards to public health, safety and the environment. The project area was once used extensively by numerous trespassing, off-road ATV enthusiasts and, as a result, many injuries occurred on site, sometimes requiring helicopter medivac. A makeshift shooting range was also set up on the property and frequented often by locals. Upon reclamation, the site’s terrain is no longer conducive for these types of dangerous recreational activities. As the land was restored, the local community no longer viewed the area permissible for the disposal of domestic garbage and dumping of animal carcasses. Hazardous pits, highwalls, and abandoned equipment were removed and the refuse is no longer a potential fire hazard. Improvements to water quality in the Brush Fork watershed have benefited aquatic life and terrestrial species within the area.

Prior to project reclamation, Brush Creek located just below the project area was net acidic with a pH of 5.9, specific conductance (SC) of 3340 µS/cm, and total alkalinity of 190 mg/L CaCO₃. Also, acidic refuse material readily oxidized and formed sulfate salts that dissolved into sulfuric acid. The acidic runoff from the site leached metals and carried them offsite. Also, the refuse was barren and severely eroding. The finer grained particles were readily washing from the site and into Brush Fork where they continue to line the creek downstream. Some of these fine particles contain acid producing materials that resulted in a direct acid load in the stream, in addition to the sulfate salts that dissolved to form sulfuric acid. The water in the pit area did not freely drain; however, it was a pool of highly acidic (pH of 2.5, total acidity 884 mg/L CaCO₃) water that traveled subsurface offsite. The pit was filled, graded and ditched so that the pit now properly drains. Post project reclamation, the stream had a pH of 7.45, SC of 2333 and total alkalinity of 233. The discharge from the site itself, post construction, has a pH of 7.7, SC of 3030 and is net alkaline. As a result of these improvements, the acid load entering Brush Fork has been significantly reduced. Also, sedimentation into the area’s watershed was reduced and, as a result, lessens the likelihood of seasonal localized flooding.

The Panther Reclamation Project established long-term benefits for the community. Citizens of the Panther community, as well as surrounding communities, regularly enjoy the now restored land. According to project landowner, Army Armstrong, “The community, county, and country have all benefited from the project. On a given weekend, more than 75 people would illegally use the property and this problem was almost to the point of being out of control. Trespassing has now ceased and visitors to the property now respectfully use the land for recreational and educational use.” Long-term benefits to the community are evident as local schoolteachers take students to the project area for nature walks and educational instruction, outdoor enthusiasts use the land for hunting wildlife, Boy Scout troops visit the area for campouts and outdoor learning projects, and various other community/specialty groups utilize the land as well. The land is no longer a blight and an attractive nuisance but respected and enjoyed instead. “This project is a win-win situation for everyone involved. This project made very good use of taxpayer money. It’s a pretty nice piece of a property now – before the project, the moon looked better than this place,” said Armstrong.
Above: Photograph of the Panther Pits site prior to undergoing reclamation. (photo courtesy of the Kentucky Division of Abandoned Mine Lands)

Above: Photograph of Panther Pits site after reclamation commenced. (photo courtesy of the Kentucky Division of Abandoned Mine Lands)
COAL AND PEAT FIRES: A GLOBAL PERSPECTIVE

Edited by Glenn B. Stracher, Anupma Prakash, and Ellina V. Sokol
Guillermo Rein (guest editor – Volume 4)

This four-volume Elsevier publication is a comprehensive collection of exciting coal and peat-fires research conducted by scientists and engineers around the globe. Hundreds of color photographs, tables, multimedia presentations, and an interactive online world map of coal and peat fires are all included. Glenn is the past Chair and Anupma the past Secretary-Treasurer of the GSA Coal Geology Division.

The book contains an abundance of data for researchers, yet is comprehensible to the general public interested in coal and peat fires. Anyone interested in coal and peat mining, coal and peat fires, and the effects of burning, from environmental to combustion metamorphism, will find this publication useful.

The contents of this work can be used as a supplement for teaching courses in coal and peat geology, environmental science and engineering, mining engineering, fire science, mineralogy, combustion metamorphism, remote sensing, etc. Prehistoric and historic case studies from around the world encompass diverse geoscience disciplines, including mineralogy, petrology, geophysics, geochemical thermodynamics, medical geology, numerical modeling, remote sensing, etc., making this work a cutting edge publication. Volume 1 is scheduled for publication around August 2010. An online microsite about the book is under development by Elsevier, http://www.Elsevier.com.

Sarah Shearer would like to thank the following people for contributing photos/information/editing for the newsletter: James C. Hower, Corey Ann Howard, Sharon Swanson, Glenn Stracher, Cortland Eble, and Steve Greb.

http://www.uky.edu/KGS/coal/GSA/