



SPHERES OF INFLUENCE

A QUARTERLY NEWSLETTER FOR DEG – AUGUST 2012

Issue 1 of the Spheres of Influence

By Tom J. Temples, DEG President 2012-2013

Welcome to the first issue of the *Spheres of Influence* Newsletter for this fiscal year. In this issue, we feature the biography of Danielle Deemer, our Managing Editor, and a condensed summary of the University of Texas study on hydraulic fracturing, written by Michele Cooney, our new Special Issues Editor. Also included is a pictorial display and description of the recent transit of Venus across our skies and a new section we've titled "The Good, the Bad and the Ugly" – an amusing way to explore how the Internet presents geologic and scientific data as it pertains to the petroleum industry. This time around, we've included several links to articles dealing with the Marcellus shale play. We have all heard the saying "It's on the Internet, so it must be true, right???" Unfortunately, that is not always the case.



The keynote speaker at the DEG luncheon in Long Beach this year was Steve Leifer of Baker Botts LLP. His talk was entitled "Hydraulic Fracturing: Separating the Myth from Reality." He addressed the myths that have been reported in the new media about "fracking." We rarely hear the industry side of this issue, and I believe that is mostly our fault. We tend to play ostrich and stick our heads in the ground and hope that it will go away. Do not be an ostrich, get involved and give our side of this important issue. If the opportunity comes up to speak to a group on the issue, take it and present the facts as we know them so that the public can make an informed decision.

We hope you find this newsletter interesting and useful. I want to encourage all members to make *Spheres of Influence* yours by submitting interesting articles or photos to our editorial staff. We are always looking for new "Rants" on topics of interest to DEG members and the geosciences community in general. In addition, please let us know if there are subjects that you would like to see covered in future issues of *Spheres of Influence*.

Featured Biography: Danielle Deemer, Managing Editor

Danielle Deemer is a petroleum geologist working in the oil and gas industry, and is currently the Team Lead of Geology and Geophysics for the Marcellus Delivery Unit at Talisman Energy USA. In this capacity, she leads the geological and geophysical analyses for Marcellus shale technical and operational work within Talisman's Pittsburgh office. Prior to working unconventional shale, Danielle worked a number of conventional plays in various areas including the Niger Delta, Chad Basin, Gulf of Mexico, Green River Basin, and Permian Basin in exploration, development, and production capacities.



Danielle earned her Bachelor of Science degree in Biology at Grove City College, and a Master of Science degree in Geology from the University of Pittsburgh, where she focused on structural geology, more specifically strike-slip kinematics. Upon entering the oil and gas industry, Danielle focused on reservoir geoscience, particularly structural geology and geophysics in development and production phase environments. She leverages both of her degrees in her current work, especially in the realm of groundwater protection and drilling.

Danielle is a native of Pittsburgh, PA, and she and her husband (also a geologist) are expecting their first child in July. Danielle enjoys spending time outdoors running, kayaking, and getting to the outcrops - all activities she looks forward to doing again after the baby is born.

The September 2012 issue of *Environmental Geosciences* will be published in a few weeks and will include two papers on the topic of geologic carbon sequestration. Neufelder et al. present their multi-faceted research on the Eau Claire Formation, a carbon storage system seal overlying the Cambrian Mt. Simon Sandstone in the Illinois basin, and Popova et al. share their comparative analysis of three different CO₂ storage resource assessment methods. Both are must-reads for those of us participating in geologic sequestration studies.



SPHERES OF INFLUENCE

University of Texas Study Sheds Much Needed Light on Shale Gas Industry

“Fact-Based Regulation for Environmental Protection in Shale Gas Development”, a report published by the Energy Institute of the University of Texas at Austin in February 2012, addresses both social and environmental impacts of shale gas development and the regulations that surround these topics. While shale gas exploration has been a major positive development for the United States energy industry, controversies over natural gas development must be addressed and resolved to further utilize this resource. The results of the investigation, focusing on media coverage and public perception, environmental and human health impacts, and the state of current drilling regulation, are briefly outlined below.

Media Coverage

Focusing on the Barnett, Haynesville, and Marcellus shale areas, researchers analyzed the tonality and reference to scientific research of national and local television transcripts, radio broadcasts, newspapers, and online articles.

- National media outlets were overwhelmingly negative (about two-thirds);
- Local media coverage followed national trends; and
- Reference to scientific research ranged from 15% of radio coverage to 33% of online coverage.

Public Perception

Roughly 1,500 residents in the Barnett shale area of Texas in 26 counties responded to an online survey. The results of this survey indicated:

- A positive attitude towards hydraulic fracturing but negative attitude towards environmental impacts;
- Overestimation of the amount of regulation and water consumption for hydraulic fracturing;
- Underestimation of the amount of electricity generated from natural gas; and
- The public was more knowledgeable of topics more frequently discussed by media outlets.

Environmental Impacts

The various phases of shale gas development were assessed for environmental and human health impacts – namely, what factors must be managed to protect humans and the environment.

- Of primary concern to the environment are erosion and sedimentation due to runoff, groundwater and surface water contamination, chemical constituents of fracturing fluids and produced or flowback water, well blowouts, emissions affecting air quality, noise pollution, and adverse health effects due to shale gas development.
- The most prevalent concerns over hydraulic fracturing are of groundwater and surface water contamination, especially where shale gas operations are in close proximity to urban centers.
- Voluntary disclosure of additives to fracturing fluids has facilitated openness in the reporting of chemical constituents (some of which are widely found in consumer products), but little is known about which chemicals should be targeted as harmful.
- A lack of pre-drilling baseline sampling and monitoring data complicates evaluations of changes in well water quality after shale drilling has taken place.
- Well blowouts and uncontrolled fluid releases are the most common well problems but are frequently under-reported.

Regulatory and Enforcement Framework

Effective regulation of shale gas development is imperative to insure protection of human health and the environment. This may require new regulations, or build upon standing regulations for conventional oil and gas development that have been implemented over the years. While shale gas is regulated at almost all levels of government, the principle regulatory authority belongs to the states.

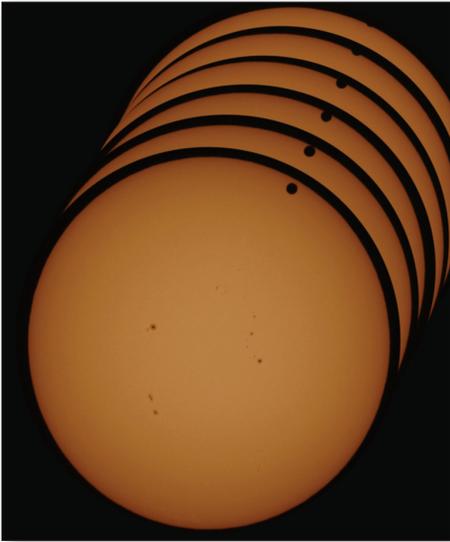
- Numerous federal laws and regulations apply to shale gas drilling, including the Clean Water Act (CWA), Clean Air Act (CAA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and others.
- Shale gas developers have several federal exemptions, such as the Resource Conservation and Recovery Act (RCRA), which gives the states regulatory responsibility regarding disposal of drilling wastes.
- Some of the most detailed state oil and gas regulations involve well drilling and casing to protect surface and groundwater resources. Although, as with all regulations, there is considerable variations among states.
- Many regulations for hydraulic fracturing were in place thanks to conventional oil and gas drilling, but need to be added to or updated in relation to shale gas.
- Wastewater and solid waste disposal is subject to various and extensive state and federal regulations, some of which have changed very recently.
- Regulation and protection of shallow aquifers in oil and gas operations needs to be a primary concern. Establishing pre-drilling groundwater quality monitoring is also essential.

To read the report in full, learn more about the investigators, and view the research data, please see:

Groat, C.G., and T.W. Grimshaw, 2012, Fact Based Regulation for Environmental Protection in Shale Gas Development, The Energy Institute at the University of Texas at Austin.

Michele Cooney, Special Issues Editor

BEAUTY IN GEOLOGY – THE TRANSIT OF VENUS



The silhouette of Venus as it transited the disk of the Sun on June 5, 2012. The smaller blemishes peppering the Sun are sunspots as seen from Kings Gap Environmental Education Center, Carlisle, Pennsylvania. Read story for details. Photo courtesy of Mark Brown, Middletown, PA.

During my short time on this Earth (in terms of geologic time), I have witnessed several once-in-a-lifetime events such as the 1994 impact of comet Shoemaker-Levy 9 into Jupiter, bright comets Hyakutake (1996), Hale-Bopp (1997), and McNaught (2007), and the Leonid meteor storm (2001). On June 8, 2004, Venus transited the sun – a predicted event that no human alive at that time had ever seen. For some viewers, the 2004 transit might have been an once-in-a-lifetime opportunity. For those who unfortunately missed it, they had to wait eight long years to truly see a “last-in-a-lifetime” event. As for me, the Venus transit was a “second once-in-a-lifetime” event that almost didn’t happen due to poor weather. However, perseverance paid off, and the clouds parted to allow this spectacle to be witnessed.

The June 5, 2012 transit was the seventh time anyone in all of recorded history had witnessed this event, and we have learned a great deal from previous transits. Such transits allowed astronomers to accurately calculate the distance between Earth and the Sun (astronomical unit); told us that Venus has no moon and that Venus has an atmosphere. Today, astronomers know there are thousands of planets orbiting distant stars. Peering out into deep space, telescopes can detect the miniscule dimming effects of a star’s light as a planet transits its host star. For me, the significance of the 2004 and 2012 transits was not only historic, but a chance to see our solar system in motion and to reflect on how Venus – a “Sphere of Influence” – has changed our view of the solar system and our place in the universe.

Unless human life spans are significantly prolonged in the next century, no human alive today will witness the next transit on December 11, 2117. As we look back on this historic event, one can only imagine how our descendants will view and image the 2117 event and what meaning it will have for them.

The images show the silhouette of Venus as it transited the disk of the Sun on June 5, 2012. The smaller blemishes peppering the Sun are sunspots. The images were captured with a Canon T2i DSLR camera attached to an 8-inch Schmidt-cassegrain telescope (filtered). Location: Kings Gap Environmental Education Center, Carlisle, Pennsylvania.

Mark Brown, Geologic Scientist, Pennsylvania Geological Survey, Middletown, PA

THE OPEN UNIVERSITY OF JAPAN VISITS THE PAGS

Researchers from The Open University of Japan paid a visit to the Pittsburgh office of the Pennsylvania Geologic Survey (PAGS) on July 5th. The University of Japan, which hosts roughly 80,000 students, is preparing an educational film on drilling in the United States, shale gas, and how energy is being developed, which will be shown on Japan’s national educational television channel.

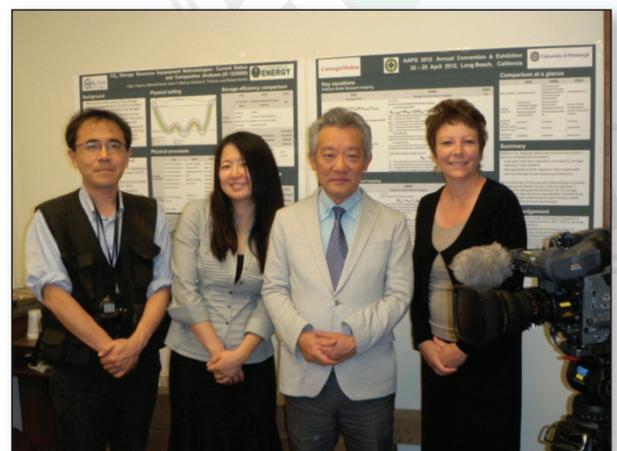
Professor Kazuo Takahashi and his colleagues sat down with Kristin Carter, Chief of the Survey’s Petroleum and Subsurface Geology Section, to discuss oil and natural gas drilling and production in Pennsylvania. Takahashi was given insight into the Marcellus shale play, Appalachian basin geology, and how technological advances as well as higher energy prices have driven investors’ acceptance of unconventional petroleum plays.

Takahashi, a professor of economics, asked how Pennsylvania has been impacted by recent shale gas production and how local economies may have been impacted. Carter cited the influx and/or expansion of major oil and gas companies in the commonwealth, increases in lease signing bonuses and higher royalty percentages for subsurface rights owners, and the recent passage of Marcellus impact fee legislation as examples of this shale play’s positive economic impact.

Professor Takahashi and Carter also discussed how the PAGS and its parent agency, the Department of Conservation and Natural Resources, works to educate groups opposing petroleum drilling and hydraulic fracturing activities by way of their website, teacher workshops, public service requests, and other means of educational outreach. Professor Takahashi and his colleagues were both interested and excited to hear about the advances in oil and gas production in Pennsylvania, as well as meet some of the PAGS staff.

Professor Takahashi, with a smile on his face, said that he was glad to see Pennsylvania’s oil and gas industry “back on the map.”

Michele Cooney, Special Issues Editor



Yuji Takeya, Tomoko Kawasumi, Kazuo Takahashi, and Kristin Carter (left to right).

The Good, The Bad, and The Ugly

The media has always been a conduit for information to reach the public. With countless individuals now having access to the Internet, news websites, group websites, and Internet blogs have become popular ways for the public to process information. Unfortunately, what's posted on various websites is not always true nor backed by scientific research. This problem has been particularly prevalent with respect to the Marcellus shale gas boom in the Appalachian basin.

The following links provide examples of articles from various news sources, Internet blogs, group pages, and more, regarding topics involving the Marcellus shale. These articles show the wide range of reporting on geological and environmental issues (in no particular order), both with well researched information and some other more questionable claims.

Links of Interest

<http://www.post-gazette.com/stories/local/neighborhoods-south/local-counties-cashing-in-on-marcellus-shale-drilling-revenues-639308/>
Pennsylvania counties cashing in on Marcellus shale drilling revenues: In the face of state budget cuts, impact fees could help communities improve infrastructure and services

<http://marcelluscoalition.org/>

The Marcellus Shale Coalition (MSC) works with exploration and production, midstream, and supply chain partners in the Appalachian Basin and across the country to address issues regarding the production of clean, job-creating, American natural gas from the Marcellus and Utica Shale plays.

http://www.cnn.com/2012/06/15/us/fracking-earthquakes/index.html?hpt=hp_c2

Debate over fracking, quakes gets louder

<http://dearsusquehanna.blogspot.com/>

A blog operated by a resident of Bradford County opposing drilling near the Susquehanna River

http://www.tu.org/press_releases/2011/trout-unlimited-expert-testifies-about-impacts-of-marcellus-shale-drilling-on-na

Trout Unlimited expert testifies about impacts of Marcellus shale drilling on natural resources at Senate committee hearing

<http://www.paenvironmentdigest.com/newsletter/default.asp?NewsletterArticleID=14643&SubjectID=>

Senate committee hears testimony on housing impacts of Marcellus shale drilling

http://www.donnan.com/Marcellus-Gas_Hickory.htm

Blogger concerned about drilling in Hickory, PA

<http://www.nytimes.com/2012/05/15/us/for-oil-workers-deadliest-danger-is-driving.html>

Deadliest danger isn't at the rig but on the road

http://www.ugcenter.com/Marcellus/Marcellus-Midstream-2012-Financial-Opportunity-Exploding-Midstream_98607

Marcellus Midstream 2012: Financial opportunity exploding in midstream

We welcome your articles, comments and feedback for this quarterly Newsletter publication.

Kristin Carter, DEG Editor-In-Chief

Submissions deadline for 2nd Quarter Issue: September 15, 2012
Submit to krcarter@pa.gov

Grand Opening!

Drake Well Exhibit

“There’s a Drop of OIL and GAS in Your Life Every Day!”

Sunday - August 26, 2012

Noon to 5:00 p.m.



Admission:

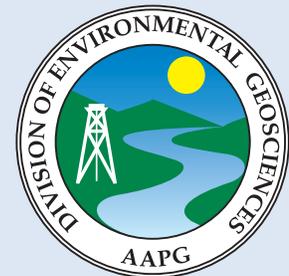
Adults \$6.00

Seniors (65+ years) \$5.00

Children (3-11 years) \$3.00

*Admission fees will increase beginning August 27, 2012

Drake Well Museum; 202 Museum Lane; Titusville, PA 16354
(814) 827-2797 or drakewell.org



<http://deg.aapg.org>

Street Address:

1444 South Boulder Ave.
Tulsa, OK 74119 USA

Mailing Address:

P.O. Box 979
Tulsa, OK 74101-0979 USA

(918) 584-2555

Toll Free (U.S./Canada): (800) 364-2274

Fax: (918) 560-2694