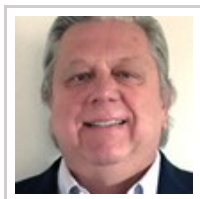


DEG Spheres of Influence September 2016



President's Column

Get to know the new DEG. Meet the new 2016-17 DEG officers and new managing editor of the SOI newsletter. DEG President Timothy Murin also discusses the goals of the Division for this year and welcomes comments on how to improve the Division.



Letter from the Editor

The latest Environmental Geosciences offers a look at the world – read a brief description of articles from the September 2016 issue.



Division of Environmental Geosciences Mission Statement and Purpose

What is the DEG? Get a refresher of the mission statement and purpose of the Division of Environmental Geosciences.



Meet Michele L. Cooney, Editor-in-Chief

Meet the new Editor-in-Chief of the DEG.



Meet Stephen M. Testa, President Testa Environmental Corporation

Meet the founder of Testa Environmental Corporation Stephen Testa.



The Good, the Bad, and the Ugly – Petroleum Exploration in the Arctic: The New Cold War

Accessing the inaccessible oil and gas above the Arctic Circle. New regulations and the arctic environment create obstacles to this virtually untapped resource.



Beauty in Geology

Making a bigger splash, the Devil's Tower in Northeastern Wyoming is revealing more and more of itself as time passes.

President's Column

September 2016 | By Timothy Murin

Please welcome Barbara Kutchko as the Managing Editor for the Spheres of Influence newsletter. She is a research scientist with the National Energy Technology Laboratory working with the development of foam cements for the petroleum industry.

Several goals for the DEG this year include:

- Continue to sponsor oral and poster sessions, forums, short courses and field trips at the ACE, section and regional meetings. A successful social event with AAPG members from the Canada Region was held at ACE 2016 in Calgary. Also, the DEG will be co-sponsoring luncheons with the EMD and DPA this fall at the Eastern and Pacific/Rocky Mt. Section meetings.
- Become more involved with AAPG affiliated societies, Young Professionals, Student Chapters and universities. It is imperative that we recruit new members to the Division. The Advisory Board can affect this by sending information to the presidents of these organizations and to the chairs of geoscience departments within their respective Section or Region.
- Consider forming new DEG ad hoc committees to address current environmental issues that are outside of the scope of the current committees. Suggested topics include induced seismicity, fugitive gases and climate change.

The Executive Committee and Advisory Board members appreciate any comments you have to improve the Division. Any of the members can be contacted through our updated website.

I hope to meet with many of you at an upcoming meeting!

Letter from the Editor

September 2016 | By Michele L. Cooney

The September 2016 issue of Environmental Geosciences takes our readers on a trip across the globe as Dr. Mostafa G. Temraz studies the reservoir sedimentology and depositional environmental of the Lower Cretaceous Alam El Buieb Formation of the Shoushan Basin by investigating lithofacies, petrography, an calcareous nanofossils. In the San Joaquin Valley of California, Mr. Preston Jordan regards the upward migration of brine after disposal injection during oil and geologic carbon storage. As always, we are seeking papers for our upcoming issues of Environmental Geosciences. Please contact Editor [Michele L. Cooney](#) with any questions.

We welcome your articles, comments and feedback for the quarterly newsletter publication.

Dr. Barbara Kutchko, Managing Editor

3rd Quarter 2016 submissions deadline is November 1, 2016

Please submit to Barbara.Kutchko@netl.doe.gov

Division of Environmental Geosciences Mission Statement and Purpose

September 2016

- EDUCATING the membership of AAPG and the general public about important issues that affect petroleum energy minerals exploration and production.
- COMMUNICATING to the general public and government agencies the Association's commitment to protect the environment while developing the world's natural resources in a responsible manner.
- APPLYING the expertise developed in the petroleum/energy minerals industries and hydrogeology to resolve environmental problems.
- PROMOTING environmental self-regulation within the petroleum/energy minerals industries.
- PROVIDING relevant educational opportunities and services for professional development of the AAPG membership through seminars and conferences in environmental geosciences, hydrogeology, and related fields.

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Meet Michele L. Cooney, Editor-in-Chief

September 2016 | Barbara Kutchko

Michele L. Cooney is a Project Geologist with AECOM in Pittsburgh, Pennsylvania. Cooney graduated in 2013 with a B.S. in Geology from Allegheny College where she completed her undergraduate thesis "The Utica Shale Play in Pennsylvania: A Characterization of the Reedsville, Antes, Utica, and Point Pleasant Formations." She received honors on her thesis as well as the David E. Rouse Award, Geology Outstanding Junior Major Prize, and the Veronica Reynolds Memorial Scholarship Award to the Field Conference of Pennsylvania Geologists. Cooney completed her M.S. in Safety Science this year at Indiana University of Pennsylvania as a member of the Honor Society of Phi Kappa Phi.



Michele Cooney

From 2013 to 2014 Cooney served as a geologic contractor with Smith Stratigraphic, LLC performing tasks associated with the Utica Shale Playbook (Patchen and Carter, eds., 2015). From 2014 to 2016, Cooney served as a geologic contractor with the Pennsylvania Geological Survey performing vitrinite reflectance on Marcellus Shale samples. Cooney began her duties as a Project Geologist with AECOM in 2016. Cooney previously served as the Special Issues Editor (2012-2014) for AAPG's Division of Environmental Geosciences (DEG) and has served as the Editor-in-Chief for DEG's Environmental Geosciences peer-reviewed journal since 2014.

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Meet Stephen M. Testa, President Testa Environmental Corporation

September 2016 | Barbara Kutchko

Stephen M. Testa is an engineering and environmental geologist, and President of Testa Environmental Corporation. From 1976 until 1994, he served as an engineering and environmental consultant for a variety of firms including Bechtel, Inc.; Dames and Moore; Converse Consultants; Engineering Enterprises, Inc.; and Applied Environmental Services which was taken public in 1993. In 1994, Testa founded Testa Environmental Corporation. From 2005 to 2015, Testa also served as Executive Officer of the California State Mining and Geology Board. Testa is the author of numerous books and publications, including *Geological Aspects of Hazardous Waste Management*; *The Reuse and Recycling of Contaminated Soils*; *Restoration of Contaminated Aquifers: Petroleum Hydrocarbons and Organic Compounds*; *Oil Spills and Gas Leaks: Environmental Response, Prevention, and Cost Recovery*; and *One Man's Planet – Earth in Today's Political Culture*. He has served as an instructor at USC and CSU Fullerton, and has provided numerous workshops and technical presentations.



Stephen Testa

Testa is the Past-President of the American Geological Institute (AGI) and the American Institute of Professional Geologists (AIPG), American Association of Petroleum Geologists-Energy Mineral Division, and the Los Angeles Basin Geological Society. Testa is past Editor-in-Chief of American Association of Petroleum Geologists – Division of Environmental Geosciences' (AAPG-DEG's) peer review journal "*Environmental Geosciences*", and the recipient of the AIPG's Martin Van Couvering Award and Honorary Membership Award, AAPG-DEG's Research Award, and the Roy Shlemon Geology Mentor Honorarium for excellence in application of applied earth science. Testa received his BS and MS in Geology from CSU Northridge, California.

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The Good, the Bad, and the Ugly – Petroleum Exploration in the Arctic: The New Cold War

September 2016 | Barbara Kutchko

Opportunity and Global Politics:

According to a 2008 study by the USGS, over a fifth of the world's undiscovered oil and gas lies above the Arctic Circle. Most of that is located offshore. Thanks to climate change, the Arctic is thawing, making the region more navigable and accessible to human activity. It has also become physically possible to extract the oil and gas resources that lie undiscovered in what is known to be one of the Earth's harshest conditions. As a result, a vast international territorial dispute has begun to take shape. Russia is the most prominent country leading to develop the Arctic's resources. Gazprom became the first company to produce oil offshore in late 2013 in the Pechora Sea – becoming the first commercial offshore oil development in the Arctic. Not to be left behind, other countries are quick to follow – the US, Canada, Denmark, Norway, Greenland, and Iceland are all investing in developing Arctic resource development.

The Arctic Environment:

Although the ice is melting, conditions in the Arctic still remain harsh and challenging for any exploration or development endeavor. There is a significant lack of infrastructure and the remote location of operational sites makes it necessary for strict contingency plans on the part of the operator. The largest offshore drilling risk is due to the presence of shifting sea ice. Onshore wells are typically drilled through a permafrost layer adding additional complexity drilling operations. It is also possible that methane hydrates lurk below the permafrost in some areas. Given these challenges, and the current low price of oil, it is not surprising that many oil companies have shelved offshore exploration plans.

US Arctic Regulations:

On July 7, 2016, the U.S. Department of the Interior announced final regulations for exploratory drilling activities. The new rules state that exploration operations must be designed and conducted specifically for Arctic conditions. For example, operations must account for shifting sea ice as well as lack of infrastructure. Other rules include requiring operators to have access to (and being able to deploy) containment equipment such as capping stacks and containment domes. The rules also state that operators must have access to a separate relief rig in order to drill a relief well in case of a loss of well control event. The operator must also develop and implement a comprehensive “oil spill response plan” that takes into account arctic conditions. The rules were jointly developed by U.S. Bureau of Ocean Energy Management BOEM and Bureau of Safety and Environmental Enforcement (BSEE). The American Petroleum Institute (API) and National Ocean Industries Association (NOIA) feel these rules do not reflect current industry capabilities (for example, new response and containment equipment) and includes many unnecessary requirements – such as relief wells. Industry believes the rules will impede development and

production, especially in light of the heavy cost to explore and drill in the Arctic.

Offshore Spill Prevention Research:

Research through the U.S. Department of Energy's National Energy Technology Laboratory is focused on developing a scientific base for predicting and quantifying potential risks associated with exploration and production in extreme offshore environments. The overarching goal of all projects is to prevent and improve response efforts related to offshore hydrocarbon spills.

Overview of Arctic resources:

National Geographic - [In the Arctic's Cold Rush, There Are No Easy Profits](#)

Department of Energy Library - [Developing Alaskan Arctic Potential](#) (pdf)

The DOI's new rules and regulations:

[Federal Register 2016-15699](#) (pdf)

Articles about the DOI's new rules and regulations:

Oil and Gas Journal - [US Interior finalizes Arctic exploratory drilling regulations](#)

E&P Magazine - [US Finalizes Drilling Regulations In Arctic Outer Continental Shelf](#)

Spill Response Research:

Arctic Council Archive - [Summary: Guide to Oil Spill Response in snow and Ice Conditions in the Arctic](#) (pdf)

National Energy Technology Laboratory - [Ultra Deepwater](#)

Journal articles detailing challenges of drilling:

OnePetro - [Exploring Cementing Practices Throughout the Arctic Region](#)

Science - [Assessment of Undiscovered Oil and Gas in the Arctic](#)

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Beauty in Geology

September 2016 | Mary Tkach

Devil's Tower is a laccolithic butte located within the Black Hills Mountains in Northeastern Wyoming. It stands nearly 870 feet from base to summit, and is about 300 feet wide at the summit. On September 24, 1906, Devil's Tower was named the first United States National Monument by Theodore Roosevelt. The butte itself is a phonolite porphyry featuring columnar jointing, and is surrounded by a landscape of sedimentary rocks. As the landscape eroded away, the butte gradually became exposed along the horizon, and with continuous erosional forces acting on the surrounding sedimentary rocks, more of the tower will be exposed over time.

Located South of Old Faithful, and nearly 7 miles past the Lone Star geyser, this small hot spring is a part of the Upper Geyser Basin. Only reachable by a moderate-difficulty hike, approximately 1,800 hot springs and cone type geysers are fed by tributaries to the FireHole River as well as year-round snow melt. The crusty-looking material surrounding the geyser opening is commonly referred to as geyserite, or generically siliceous sinter, that forms as a precipitate from mineral-leaching waters that were measured at 219 degrees F at the surface. The orange color just above the water is due to the presence of thermophilic bacteria containing carotenoid pigments called Phormidium.



Devil's Tower National Monument, Crook County, Wyoming



Upper Geyser Basin, Backcountry Thermal Areas, Yellowstone National Park, Wyoming