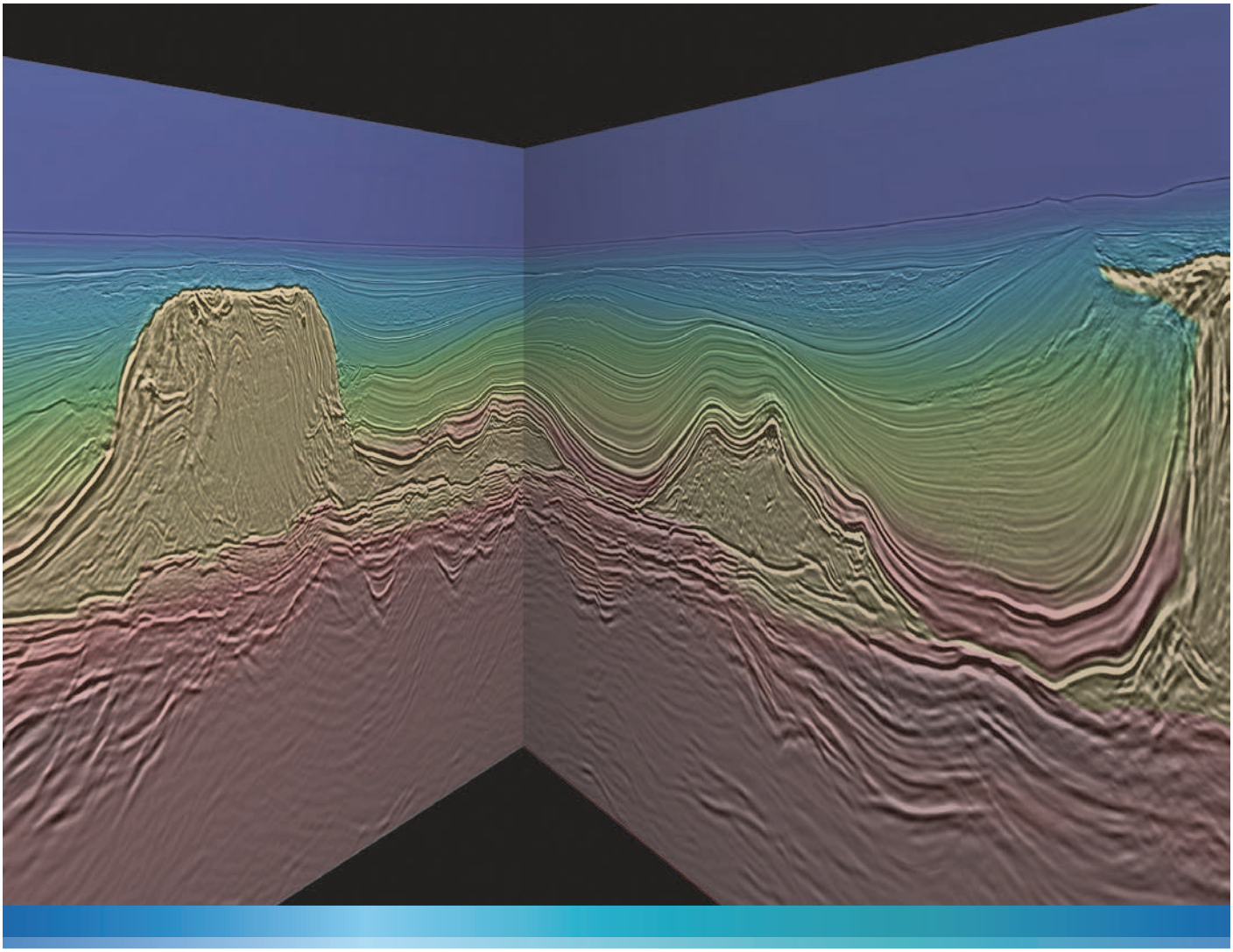
HGS Bulletin
Houston Geological Society
Volume 60, Number 7
March 2018

Election Issue



Santos Basin

Brazil – Santos Vision Area 1

PGS announces the availability of Area 1 from its Santos Vision project within the pre-salt play in the Santos Basin, offshore Brazil. The total project will cover 34 000 sq.km.Exploration plays in Area 1 include: a rift/pre-rift fault-trap play in the west-central part of the area, with prospective siliciclastic reservoirs in the Paleozoic pre-rift through Lower Cretaceous rift succession; a sag/rift limestone edge play (Sagitário trend), involving subsalt structural or paleo-topographic traps in microbial platform limestone; and the Carcará North/Uirapuru sag-rift limestone play, which includes the Carcará discovery in BMS-8 and several significant closures at the base of salt.

Santos Vision Area 1 deliverables will be available for the upcoming license rounds.

Please contact: brazilinfo@pgs.com

PGS

The Bulletin
Houston Geological Society

Volume 60, Number 7 March 2018

In Every Issue

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Technical Meetings

Other Features

About the Cover: Rainbow offshore Cuba. Photo by James Deckelman

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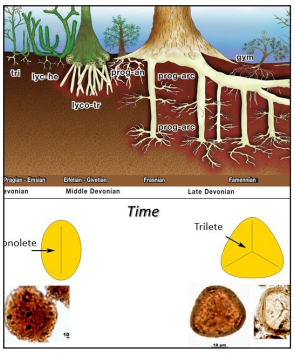

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Please join us for the Houston Geological Society's premier technical conference, offering the latest breakthroughs, technical perspectives and integrated approaches to unconventional reservoir assessment.

DAY 1

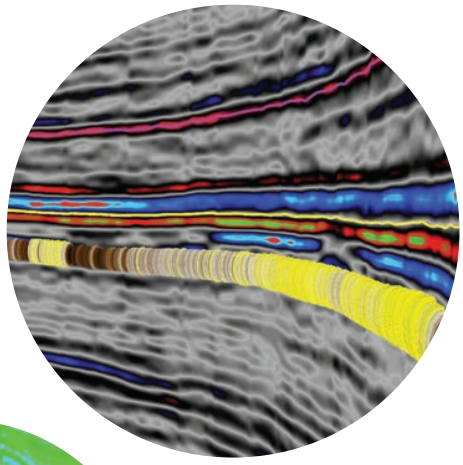
- **Session 1:** Diagenetic Components of Mudrocks and Their Impact on Production
- **Session 2:** Nanoscale Porosity and Hydrocarbon Phase Producibility / Wettability
- **Session 3:** Predicting petrophysical flow properties using digital rock physics
- **Session 4:** Geophysical Methods for Producibility, Fracability and GeoHazards

DAY 2

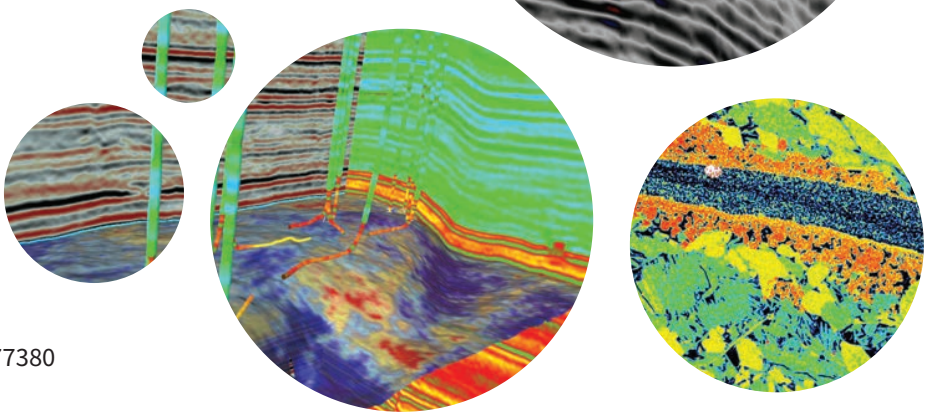
- **Session 5:** Analytical Applications for Improved Hydrocarbon Recovery
- **Session 6:** Hybrid Tight / Complex Opportunities
- **Session 7:** Technology Applications for Stimulated Rock Volumes Versus Drained Rock Volume
- **Session 8:** Operator Cases of Integrated Applied Geoscience for Fun and Profit

DAY 3

- **Workshop (separate registration):** Applied Methods of Core Descriptions to Maximize Value to an Operator (geared for the novice to the expert)



The full integrated industry member developed program includes the latest University Research (Poster Program Event), supporting Cores (Multi-Core event) and a Luncheon Keynote SME Speaker, as well as an first evening industry social.



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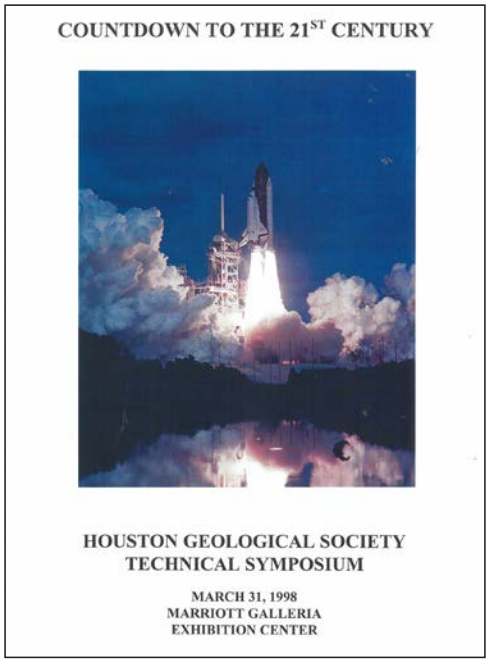
John A. Adamick
john.adamick@tgs.com

Conference Call…

This month's column focuses on the quality technical conferences provided to the industry each year by the HGS. If you have been a geoscientist for any length of time in our industry you have undoubtedly been inundated with opportunities to participate in many conferences. You have likely attended at least a few of them and may have presented a paper, been a session organizer, or otherwise involved in the planning and execution of the event. Conferences within the oil and gas industry run the gamut from technical programs on specific disciplines (AAPG, SEG, SPE) to general business shows (NAPE, DUG) to area specific (GCAGS) and even to play type (URTeC) programs. These conferences all serve a valuable function to industry in helping disseminate the latest ideas in the field. Many of the conferences are organized and run primarily by volunteers as well as being an excellent opportunity for geoscientists to hone their presentation skills (presenting papers) or their management skills (supporting work required bring a conference together).

During my career I have been fortunate enough to have participated as a presenter, session chairman, or organizer for conferences at the local, regional, and national level. One of my favorites was the HGS 75th Anniversary Technical Symposium themed as "Countdown to the 21st Century" (see photo). I was chairman of this event and had a lot of fun pulling together ideas for the future of the industry. There were sessions on Macroeconomics, Emerging Technology and two sessions on Deepwater Exploration. It is very interesting to go back and review the abstracts from that symposium and to compare to conditions today! The HGS 100th anniversary will be here soon and it is likely we will try to have another symposium in addition to a lot of other celebratory activities. Please contact me at john.adamick@tgs.com if you are interested in participating on the steering committee for this event.



Early in my career there were only a few major conferences to consider attending each year but the number of shows, and the variety, has increased tremendously over time. At the same time a lot of oil and gas companies have greatly reduced the number of people they send to technical conferences for budgetary reasons. One of the key costs of attending multi-day conferences is travel and lodging. And this is where your local geoscience society comes in to play. The HGS has held local conferences for many years. These conferences provide a lot of "bang for the buck" for anyone interested in learning new ideas or insights on specific topics while keeping costs down and eliminating travel costs for members. I'd like to draw your attention to three specific programs, the two Applied Geoscience Conferences (Mudrocks and Geomechanics) and the Africa Conference.

The concept for the Mudrocks Geoscience Conference was conceived in 2006. Since inception it has been run by chairman **Frank Walles** and an army of session volunteers. Due to its popularity the Mudrocks Conference is held over two days each year and usually sells out. The conference provides attendees with the latest research on unconventional reservoir characterization and was developed to provide attendees practical applied methods for optimization of recovery. It is a terrific bargain and if you are a geoscientist involved in unconventional plays you should strongly consider attending. The goal of the event is to include practical applied geoscience presentations from top contributors of "the radical middles" (the research intersection of industry, government, and university). The event this year will be held March 6-8th at the Anadarko Conference Center and themed "Integrated Approaches of Unconventional Reservoir Assessment and Optimization. The event this year includes two days of technical sessions in addition to a workshop on the third day.

The idea behind the Geomechanics Geoscience Conference was to use the same

From the President *continued on page 14*

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Leadership Conference

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  Use Big Data to identify the acreage that is cost effective and high producing with today's technology.
- **Technologies and Techniques**
  Learn about the technologies and techniques that will maximize output from every well.
- **Reinvent How You Think About Basins**
  Practice 3D thinking to envision source rocks, traps, and stacks… not just planes.
- **Join the Community**
  Join your super basin community and pool basin specific knowledge to make everyone more profitable.
- **Find Solutions in Existing Science**
  Discover global analogues from the world's most petroliferous basins.

Mix with the Experts

Super Basins is a great place to meet and mix with the presenters and attendees who know the globe's great basins the best. Numerous meals and mixers are provided to ensure you have the one-on-one time you need to ask your questions, develop new relationships, and discuss new opportunities.

Basins From All Over the World!

- **Super Basins**, *Bob Fryklund, Pete Stark, IHS Markit*
- **Permian Basin**, *Scott Sheffield, Pioneer*
- **Overview of the Greater Super Basin Concept and How it Might Evolve**, *Scott W. Tinker, Tinker Energy Associates, LLC*
- **Appalachian Basin**, *William A. Zagorski, Range Resources*
- **Anadarko Basin**, *Rick Fritz, Council Oak*
- **Going Beyond the North American Mudrock Super Basin Plays: The Unconventional Development of Conventional Reservoirs**, *Richard K. Stoneburner, Pine Brook Partners*
- **Williston Basin**, *Mark Williams, Whiting Petroleum Corporation*
- **The Western Canada Basin, A Confluence of Science, Technology, and Ideas**, *Paul MacKay, Shale Petroleum Ltd.*
- **California, San Joaquin**, *Kurt Neher, Berry Petroleum Company, LLC*
- **Alaska – North Slope**, *David Houseknecht, USGS*
- **Gulf of Mexico Offshore Evolution of Past, Present, and Future Plays**, *Cindy Yeilding, BP America*
- **Americas Unconventional Energy Opportunity – An Update**, *David Gee, The Boston Consulting Group*
- **Mexico, Tampico-Misantla Basin and Sur Este Basin**, *Mark Shann, Sierra Oil and Gas*
- **Neuquén Basin**, *Carlos Macellari, Tecpetrol*
- **North Sea**, *John Underhill, Heriot-Watt University*
- **The Arabian Basins: Prolific Producers with Bright Futures**, *Ibraheem Assa' adan, Saudi Aramco*
- **North Africa – a rejuvenated Super Basin**, *Jonathan Craig, Andrea Cozzi, ENI*
- **Brazil Pre Salt, Santos Basin**, *Mario Carminatti, Petrobras*
- **Western Siberia**, *Alexei V. Milkov, Colorado School of Mines, Vladimir Vyssotsky, BP Russia, Andrei S. Bochkov, GazpromNeft*
- **COP Operator Stimulated Rock Volume**, *Greg Leveille, ConocoPhillips*
- **Super Basins, Super Data, Super Results**, *Shandell Szabo, Anadarko*
- **Big Picture Geophysics and Reservoir Packages**, *Brian Horn, ION*

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Super Basins…*The Oily Places*

Recently IHSMarket developed the idea of a *Super Basin* as a basin that has produced over 5 billion barrels of oil equivalent (BBOE) and has an additional 5 BBOE in remaining reserves. We all are familiar with many of these places: Gulf of Mexico, Permian Basin, North Sea, Offshore Nigeria, Arabian basins, Alaska North Slope. The continued search for additional hydrocarbon resources has resulted in many innovations, changes in technology, leaps in geologic understanding and improvement in the exploration process resulting in the US producing over 10 million barrels of oil daily, the largest in any time in the history of the industry. The *unconventional* revolution is now conventional and has become a dominant method of exploration and exploitation of hydrocarbon resources in North America. While technology continues to provide new access to what once were uneconomic hydrocarbon accumulations, much of this activity is focused on what are generally considered mature basins.

When I worked in new ventures I remember a comment made by Iann Vann (EVP Exploration at BP), "if you want to find oil, you must look in the oily places." At first glance this seemed to be simplistic, of course you find oil in oily places. In the years that have followed I have come to understand the insight and value of these words and the truth of these words is what makes a *Super Basin*. We find oil in oily places and we will continue to find more oil in oily places. Super Basins are unique places on the earth and as technology progresses the industry will continue unlock the ultimate potential of present and future *oily places*.

Old Place – New Ideas

In 1958, Parke Dickey wrote, "We usually find oil in a new place with old ideas. Sometimes, we find oil in an old place with a new idea, but we seldom find much oil in an old place with an old idea." This is more applicable today than ever before. The caveat I would add is that when the old place is a Super Basin, industry has probably not discovered the full potential of that area due to the application of limited technology or ideas.

A major cause of the continual rejuvenation of many mature basins has been the ability of seismic data to provide a better image of the subsurface geometry, lithology and the ability to understand basin evolution through time. Long-record, long-offset data provide a better image of the deepest parts of a basin. Multi-azimuth data enable attribute analysis to better predict fluid types, rock properties and fracture orientation. The development of drilling and completion technologies has changed the *conventional* idea of reservoir rock quality. Our understanding of petroleum systems and prediction of fluid type variability across a basin provides new ways to drill and complete a multitude of reservoirs and begin to better understand the interplay of lithology/petrophysics, fluids, pore space, rock physics, pore pressure and geomechanical properties in the subsurface.

Looking for the Next Super Basin

What are the new ideas that will unlock emerging basins and ultimately add to the Super Basin category? The following is a short list that comes to mind:

1. **Fiscal Terms** will be the biggest driver for continued exploration. High production takes by NOCs or governments, taxation or regulation are impediments to continued drilling and future exploration growth.
2. **Understanding a Basin** from the *bottom up* is an integral part of the exploration process and provides the ability to understand the basin in a regional framework and provides a basis for high-grading new areas. In many North American basins where drilling activity is high, the regional framework is based on the abundance of well control and is a benefit to working a mature basin. Alternatively, the depth to drilling also can function as a barrier to understanding deeper potential in a basin and often bias current paradigms or conventional wisdom with respect to a deeper play.
3. **A Quality Database** – the fidelity of a subsurface database (well logs, stratigraphic correlation, seismic data, and production/pressure data) is perhaps the most critical aspect for future exploration activity and success. Any exploration geoscientist knows that unless the database in an area is consistent, accurate and easily accessible the exploration process will be slowed and play concepts and drillable prospects will have a greater uncertainty. The seasoned explorationist will have patience to sift through mountains of data to find nuggets of insight that can support a new play

From the Editor *continued on page 14*

Applied Geoscience Conference

March 6-8, 2018

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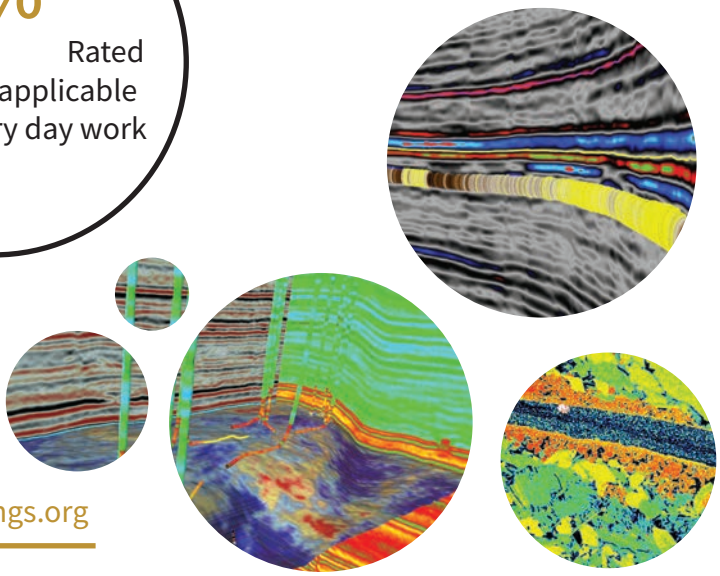
93% Rated the overall quality of the technical presentations as good or exceptional compared to other industry conferences

91% Rated the talks as applicable to their every day work



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Applied Geoscience Conference

March 6-8, 2018

Integrated Approaches of Unconventional Reservoir Assessment and Optimization

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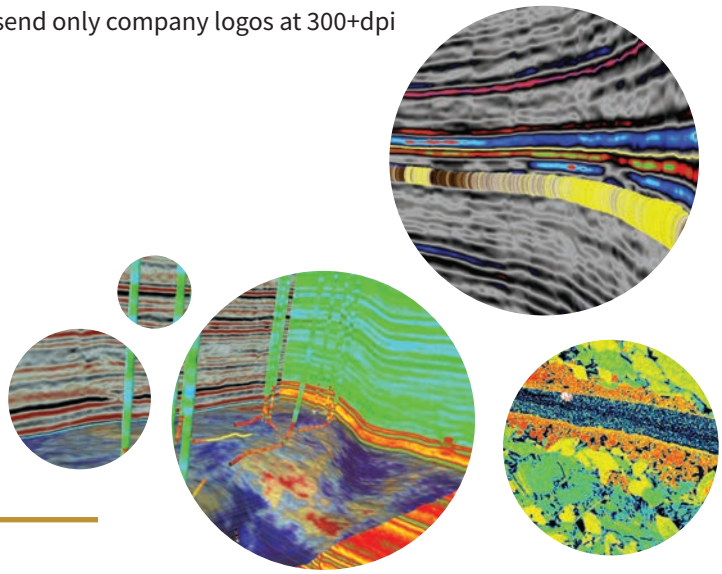

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Applied Geoscience Conference

March 6-8, 2018

Oral Presentations – Tuesday, March 6, 2018

7:00	**Registration and Coffee**	
8:00 - 8:10	**Welcome and Opening Remarks:** Frank Walles, *Baker Hughes, a GE company*; John Adamick, *TGS, HGS President 2017-2018*	
	Session 1: Diagenetic Components of Mudrocks and Their Impact on Production **Chairs:** Tina Calvin, Wayne Camp and Ian McGlynn	
8:10 - 8:45	Quartz Cementation in Mudrocks: How Common Is It?	**Kitty Milliken**, *Bureau of Economic Geology, The University of Texas at Austin*
8:45 - 9:20	Organic Diagenesis (Artificial Thermal Maturation Studies) – Pyrolysis with SEM Observations	**Bobby Hooghan,** *Weatherford Laboratories;* **Lori Hathon,** *University of Houston*
9:20 - 9:55	Fluid Inclusion Technology Applications for Mudrock Petroleum Source Rocks	**Don Hall**, *Fluid Inclusion Technologies, a Schlumberger Company*
9:55 - 10:20	**Coffee, Posters, Exhibits**	
	Session 2: Nanoscale Intra-Kerogen Porosity and Hydrocarbon Phase Producibility/Wettability **Chairs:** Avrami Grader, James Macquaker and Steve Geetan	
10:20 - 10:55	Reservoir Quality of the Middle Bakken Controlled by a 300 Ma History of Carbonate Cementation and Dolomitization	**Andy Aplin**, *Durham University;* M. Brodie, J.W. Valley, I.J. Orland, B.S. Hart
10:55 - 11:30	Reservoir Characterization and Modeling to Determine the Mechanisms Controlling Enhanced Oil Recovery from Tight Oil Formations – A Bakken Case Study	**James Sorensen,** *EERC;* Steven Hawthorne, Larry Pekot, Beth Kurz, Lu Jin, Jose Torres
11:30 - 12:30	**Lunch, Posters, Exhibits**	
	Keynote Chair: Arlin Howles	
12:00 - 12:30	**Keynote:** Water Resource Issues within Unconventional Resource Development in the Permian Basin	**Dr. Bridgett Scanlon** *The University of Texas*
	Session 3: Predicting Petrophysical Flow Properties Using Digital Rock Physics **Chairs:** Timothy Diggs and Matt Bratovich	
12:30 - 1:10	A Digital Rock Investigation of the Role of Knudsen Number for Flow in Unconventional Reservoirs	**Juan Bautista**, *EXA Corp.*
1:10 - 1:45	Multi-Phase Fluid Imbibition, Distribution and Wettability in Shale through Synchrotron Based Dynamic Micro-CT Imaging	**Sheng Peng**, *Bureau of Economic Geology, The University of Texas at Austin*
1:45 - 2:20	A Multiscale Study of Fluid Flow in Mudrock Systems	**Farzam Javadpour,** *Bureau of Economic Geology, The University of Texas at Austin*
2:20 - 2:45	**Coffee, Posters, Exhibits**	
	Session 4: Geophysical Methods for Producibility, Fracability and GeoHazards **Chairs:** Lisa Neelen and Shon Bourgeois	
2:45 - 3:20	PP-PS Joint Inversion Feasibility Study – Oklahoma Unconventional Resource Play Example	**Pete Christianson, Magdy Ghattas, Robert Hu,** *Marathon*
3:20 - 3:55	Using Airborne Full Tensor Gradiometry to Aid in Recognition and Risk Assessment of Dissolution Karst within Permian Evaporites, Delaware Basin, Texas	**Alan Morgan,** *Bell Geospace*
	Closing Comments and Invitation to Posters and Core Sessions	
4:15 - 8:00	**Social Hour**	

Applied Geoscience Conference

March 6-8, 2018

Oral Presentations – Wednesday, March 7, 2018

7:00	**Registration and Coffee**	
8:00 - 8:10	**Welcome and Opening Remarks:** Frank Walles, *Baker Hughes, a GE company*	
	Session 5: Analytics Applications for Improved Hydrocarbon Recovery **Chairs:** Andrew Silver and Brian Velardo	
8:10 - 8:45	Multivariate Modelling of Oil and Gas Production Using Geology and Completion Factors	**Dr. Richard Batsell,** *Rice University*
8:45 - 9:20	The Abuse of R^2: How Correlation Statistics are Misunderstood and Misused	**Andrew Silver,** *Creeta Resources, LLC*
9:20 - 9:55	Log Response Groups: Letting the Data Speak For Itself	**J. L. Gevirtz** and **A. P. Ovalle**, *Halliburton Global Consulting*
9:55 - 10:20	**Coffee, Posters, Exhibits**	
	Session 6: Hybrid/Tight/Complex Opportunities **Chairs:** Obie Djordjevic and Barbara Hill	
10:20 - 10:55	The Vaca Muerta Play (Neuquen Basin, Argentina). A Case Where Bentonites Help to Assess Early Development Areas, Predict TOC and Quantify Lateral Facies Variations	**Daniel Minisini,** *Shell*
10:55 - 11:30	Depositional Interpretation and Sequence Stratigraphic Control on Reservoir Quality and Distribution in the Meramec STACK Play: Anadarko Basin, Oklahoma	**Buddy Price**, A. Pollack, A. Lamb, *Devon Energy*
11:30 - 12:30	**Lunch, Posters, Exhibits**	
	Session 7: Technology Applications for Stimulated Rock Volume Versus Drained Rock Volume **Chairs:** Luis Baez and Eric Michaels	
1:00 - 1:35	Accelerating Completions Concept Select in Unconventional Plays Using Diagnostics and Frac Modelling	**Ali Azad,** Kiran Somanchi, Jim Brewer and Dan Yang *Shell*
1:35 - 2:10	Optimizing Field Development Strategy Using Time-Lapse Geochemistry and Production Allocation in Eagle Ford	**Jason Jweda,** *ConocoPhillips*
2:10 - 2:45	Sampling a Stimulated Rock Volume	**Kevin Raterman,** *ConocoPhillips*
2:45 - 3:15	**Coffee, Posters, Exhibits**	
	Session 8: Operator Cases of Integrated Applied Geoscience for Fun and Profit **Chairs:** John Breyer and Raj Malpani	
3:15 - 4:15	Permian Basin Wolfcamp: Field Development, Critical Data Acquisition, Integration and Workflow	**Phil Lindner, John Ndungu,** *Pioneer*; Kyle Scott, Omkar Jaripatke, Hector Bello, Weichun Chu, *Pioneer Resources*
	Closing Comments and Invitation to Posters	

Poster Session

Invited Presentations from Graduate Students

Open during Coffee and Lunch Breaks

Applied Geoscience Conference

March 6-8, 2018

Posters – March 6-8, 2018

Poster Session Chair: Mike Effler

University	Student Name	Poster Topic
Oklahoma State University	**Michele Abshire**	The Uranium/TOC Conundrum of Black Shales: What Gamma-Ray Logs Might Miss
Oklahoma State University	**Yulun Wang**	Natural Fractures and Their Relationship to Facies, Sequence Stratigraphy, and Rebound Hardness, the "Mississippian Limestone" Play, North-Central Oklahoma, U.S.A
Texas A&M University	**Telemachos Manos**	Thermal Maturity Modeling of Organic-Rich Mudrocks in the Delaware Basin using Raman Spectroscopy of Carbonaceous Material
Texas A&M University	**Roy Conte**	Integrating Core, Wireline Log and Chemostratigraphic Data with Biostratigraphic Data and High Resolution U-Pb Zircon Geochronology to Determine Timing Constraints on the Eagle Ford Group Depositional Processes and Stratigraphy
Texas A&M University	**Sergey Parsegov**	Micromechanics of Mudstones. Cost Effective Measurements
The University of Oklahoma	**Pritesh Bhoumick**	Mapping Hydraulic Fractures Propagation using Polarized Shear Wave
The University of Texas of the Permian Basin	**Fatimah Adelekan**	Integrated study of the Wolfcamp Debris Flow, Delaware Basin, Texas to Determine the Depositional Environment, Sequence Stratigraphy and Petrophysical Analysis: Case Study – Mendel Field
The University of Texas of the Permian Basin	**Joanna Walker**	A New Approach to Fracture Identification within the Wolfcamp Formation of the Delaware Basin By Means of Dispersion from Refracted Shear
University of Alberta	**Noga Vaisblat**	Rock Fabric, Rock Composition, and Reservoir Quality in the Montney Formation, Western Canada
University of Calgary	**Emma Percy**	Calcareous Organic-Rich Mudstone Depositional Processes on a Low-Gradient Ramp, Example from the Turonian Second White Specks Formation, West-Central Alberta, Canada
University of Houston	**Zohreh Souri**	Identification of Sweet Spots for Hydraulic Fracture in Avalon Shale, Permian Basin, Using Lithofacies Classification
University of Kansas	**Jeff Jennings**	Identifying at Risk Areas for Injection-Induced Seismicity Through Subsurface Analysis of the State of Kansas

Participating Schools

Oklahoma State University • Texas A&M University • The University of Oklahoma
The University of Texas • University of Alberta • University of Calgary
University of Houston • University of Kansas

Open During Coffee and Lunch Breaks

The Houston Geological Society Continuing Education Committee Presents

Applied Methods of Mudstone Core Description and Interpretation

A One-Day Short Course
by Dr. Ursula Hammes and Dr. Kirk Campion
Thursday, March 8, 2018 • Bureau of Economic Geology Houston Research Center
11611 West Little York, Houston, TX 77041

The Houston Geological Society is pleased to announce a new continuing education seminar titled "Applied Methods of Mudstone Core Description and Interpretation" held in conjunction with the Applied Geoscience "Mudrocks" Conference on March 8, 2018 at the Bureau of Economic Geology Houston Research Center (HRC) core facility, in Houston, Texas.

The one-day seminar is intended for geologists of all experience levels interested in improving their skills in identifying and interpreting physical sedimentary structures, and recognizing vertical stratigraphic relationships observable from conventional full-diameter slabbed cores. Participants will learn how to identify key sedimentary features in a stratigraphic context necessary to describe mudstone facies at a practical scale to tie to well logs for improved reservoir characterization and mapping.

The full-day course will consist of introductory lectures followed by hands-on core examination guided by the instructors Dr. Ursula Hammes and Dr. Kirk Campion. A wide variety of productive shale and tight oil and gas reservoirs will be examined from the following formations: Bakken, Woodford, Mississippian Lime, Haynesville, Eagle Ford and Marcellus.

Class size is limited, so register early

Date: Thursday, March 8, 2018

Please make your reservations on-line www.hgs.org

For more information about this event, contact HGS Office 713-463-9476 • office@hgs.org

Dr. Ursula Hammes is president and founder of Hammes Energy & Consultants, LLC located in Austin, Texas. Her current research interest is focused on shale oil & gas systems from basin- to nano-scale applying her background in carbonate and clastic sequence stratigraphy, depositional systems analysis, and reservoir diagenesis. Dr. Hammes received her Master's degree from University of Erlangen, Germany and her PhD from the University of Colorado at Boulder. Ursula has held past positions at Anadarko Petroleum, The Woodlands; the Texas Bureau of Economic Geology, Austin; and the University of Potsdam, Germany. Dr. Hammes serves as an associate editor for the *AAPG Bulletin*, AAPG Energy Minerals Division Shale Gas and Liquids Committee Chair, and has served as president of the Gulf Coast Section SEPM. She has published over 200 papers, including co-editing AAPG Memoir 105 on the Haynesville shale gas field. Dr. Hammes is currently an adjunct professor teaching at Texas A&M University as a Halbouty Visiting Chair.

Dr. Kirt Campion is currently a consulting geologist, recently retired from Marathon Oil Company where he worked as a senior stratigrapher from 2008 to 2017. Prior to working at Marathon, he worked at Exxon Production Research Company and ExxonMobil Upstream Research Company for 29 years as a clastic sedimentologist and stratigrapher, specializing in deep-water sequence stratigraphy. Dr. Campion received his Master's Degree from the University of Nebraska and his PhD from Ohio State University. Kirt has worked with core data representing wide variety of unconventional petroleum systems including: the Bakken in the Williston Basin, Woodford in the Anadarko Basin, Eagleford in south Texas, Siluro-Ordovician in Poland, and Spraberry in the Permian Basin. Kirt has been an active member of AAPG and SEPM for over 40 years. He has published several papers on sequence stratigraphy and on deep-water stratigraphy in California and Chile. He has guided field trips to a number of localities in California and Utah for AAPG, SEPM and GSA.

From the President continued from page 5

format as used for Mudrocks but to focus on geomechanical characterization, engineering applications, surveillance and diagnostics, and case studies. The initial conference was held in 2013 and occurs every other year. The two-day 2017 event was held in November at the Southwestern Energy Conference Center and organized by co-chairs **Robert Hurt** and **Umesh Prasad** along with 22 committee members. They convened a very successful event with eight different session and numerous student poster sessions.

The longest running HGS conference is the Africa Conference which began in 2001 in conjunction with the Petroleum Exploration Society of Great Britain (PESGB). The event occurs every year but the location of the conference alternates each year between Houston and London so that it is effectively held in Houston every 2 years. Each year the conference focuses on new and developing exploration plays on the African continent. A primary goal of the conference is to provide inexpensive, quality training and international networking opportunities for HGS membership and the greater geological community. The program typically includes oral sessions, poster session, short courses, and workshops. The 17th Africa Conference will be held September 10-13, 2018 at the Norris Center here in Houston. Convention chairman **Brian Horn** and his team have been hard at work putting this conference together and I have no doubt that it will be successful once again.

The organizers of the HGS conferences work very hard to provide our members with quality technical content at a low cost. Many of the venues for the events are donated by HGS member companies (thank you, Anadarko and Southwestern Energy) and chairmen also sell exhibit space to vendors and obtain sponsor dollars to help subsidize the events. I highly encourage you to give one or more of these HGS conferences a try. You won't be disappointed.

I'd like to close my column by recognizing **Frank Walles**, mentioned earlier. Frank originally conceived both the Mudrocks and Geomechanics Conferences. From the beginning these events provided high-quality technical content and were very professionally managed. They have come from nowhere to become technical mainstays of HGS. Although Frank has a large group of dedicated volunteers that help make these events a success each year, I would like to personally thank him for executing on his vision of what a good technical program should be. I hope you will as well. ■

From the Editor continued from page 7

concept.

4. **Improved Seismic Imaging** – The ability of high speed computing and data storage has led to the creation of large 3D data sets (50-80,000 km^2). These legacy data acquired over the past twenty-five years from multiple different surveys can add significant value at a much lower price point. Development in seismic processing algorithms such as reverse time migration (RTM) and full waveform inversion (FWI) have enabled companies to reprocess legacy seismic data acquired with various parameters to be merged and reprocessed creating new fit-for-purpose 3D data that provide a product that is comparable to many modern wide azimuth surveys that are cost efficient.
5. **Geologic Ideas/Innovation** – regional evaluations and analysis in offshore exploration rely primarily on seismic data and the development of play fairway concepts. Reconstructing the conjugate margins of what was a single basin, correlations from source to sink can provide insight and ideas. The recent discoveries along the transform margin of Africa in Ghana are a great example of a play type that has been extended to the conjugate margin as evidenced by the major discoveries in offshore South America. Understanding similarities and differences in analogous play types around the world will continue to be a key factor in changing emerging basins with significant discoveries into the next Super basin or guide us to look similar plays in new areas.

Looking Toward the Future

Super Basins are not an accident. Their endowment of hydrocarbons is the result of many different factors that have developed in the optimal time frame with the optimal petroleum system. Understanding what makes these basins work, why they contain the large volume of recoverable reserves and what are the similarities and differences between super basins will be keys to unlocking the ultimate potential of these areas. The most important factor is the presence of a prolific source rock(s). Without an active petroleum system there are no exploitable hydrocarbons. Sound fundamental analysis and technical innovation will be essential in future exploration programs in these basins, however; as Wallace Pratt said, "Oil is first found, in the final analysis, in the minds of men."

For information about the upcoming Super Basins Conference go to http://superbasins.aapg.org/2018 ■

Monday, March 5, 2018

New Location
Live Oak Room • Norris Conference Center • 816 Town and Country Blvd #210
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $40 Preregistered members; $45 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

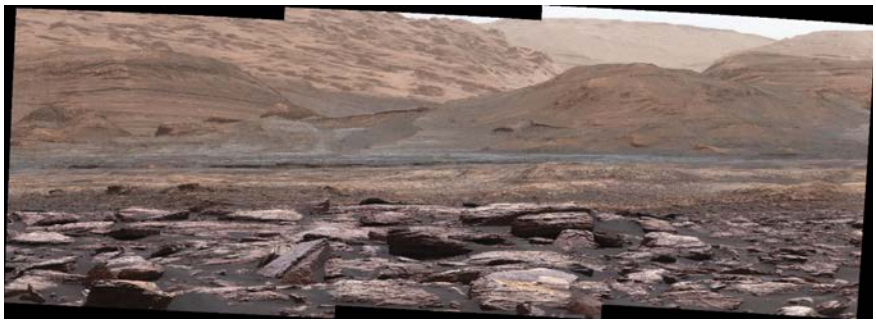
If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS General Dinner Meeting

Kirsten Siebach
Rice University

Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover

The Mars Science Laboratory rover, *Curiosity*, landed on the floor of Gale crater, Mars, on August 5, 2012. In the last 5.5 years, Curiosity has traversed over 11 miles (18 km) to explore 1,200 ft (370 m) of basin-fill stratigraphy exposed as layered sediments preserved around the craters' central peak, a 16,000 ft (5 km) tall stack of sediments dubbed Mount Sharp.



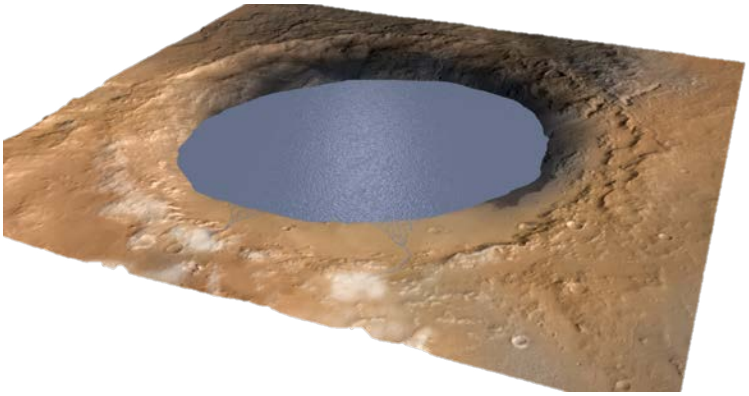
A portion of Mount Sharp, the preserved mound of sedimentary rocks in Gale crater [NASA/JPL/MSSS]

Along this traverse, *Curiosity* has collected tens of thousands of images of the Martian surface in addition to 500,000 laser shot-based chemistry analyses, 600 bulk chemistry analyses. The lab rover has 15 drilled samples observed with both a mass spectrometer and an x-ray diffractometer, sending the data back to Earth on a daily basis. The instrument suite onboard *Curiosity* has enabled the highest resolution ever achieved in in-situ imaging of planetary surface samples, the first age date on another planet, ongoing chemostratigraphy based on multiple scales of compositional measurements, and ten robotic Martian selfies.

Selfie taken by Curiosity *1941 sols (Martian days) after landing, with sand dunes and Mount Sharp [NASA/JPL/MSSS].*

Far beyond the numbers, *Curiosity*'s findings have revolutionized our understanding of Mars. Whereas it was once thought that Mars may have only had intermittent short-lived periods of relatively clement atmospheric conditions, *Curiosity* has investigated over 300 m of mudstone deposited in a lake of liquid water that would have potentially had habitable conditions for life ~3.5 billion years ago that seems to have been sustained

HGS General Dinner *continued on pag 17*



Simulation of lake in Gale crater [NASA/JPL].

The Houston Geological Society Continuing Education Committee Presents

The Lucia Method of Carbonate Reservoir Characterization

A One-Day Short Course
by David Orchard
Friday, April 6, 2018 • Apache Corporation
2000 Post Oak Boulevard, Room 108 • Houston, Texas 77056

Methods developed by Floyd J. (Jerry) Lucia provide a direct link between rock fabrics and the petrophysical behavior of carbonate reservoir rocks. These are core/petrography and log-based methods for modeling relationships between depositional/diagenetic facies, porosity, permeability, and water saturation/height functions in oil reservoirs. They effectively deal with the infamous complexity of carbonate rock properties. They are applicable for both "quick look" evaluations and detailed reservoir models and are widely applied to reservoir studies in the Permian Basin and other carbonate systems.

This one-day course provides lectures and spreadsheet exercises to train attendees in the theory and application of the methods. Mr. Lucia has provided his lecture and exercise materials for use in this seminar and additional new case studies will be introduced by the instructor..

Pricing

HGS Members unemployed: call for special pricing

Early Registration: by 8AM, Friday, March 23, 2018:		**Registration:** Through 8 AM, Friday, March 30, 2018:	
HGS Member:	$100.00	HGS Member:	$110.00
Non-Member:	$140.00	Non-Member:	$150.00
HGS Student Member:	$80.00	HGS Student Member:	$80.00

Non-members can save $10 and receive the Member registration price, if they apply for any category of HGS membership online (https://www.hgs.org/membership_overview), submit the application, including payment, then register for the course by calling the HGS Office (713-463-9476) before receiving formal acceptance.

Registrants will receive by email, before the course, a map and specific directions for entrance, parking, and visitor check-in.

Notebook, Certificate of Attendance, Networking Lunch, Continental Breakfast, Coffee and Break Refreshments are included in the Registration price.

Date: Friday, April 6, 2018 • 8:30 am – 5 pm (Doors open at 7:30 am)

Location: Apache Corporation • 2000 Post Oak Boulevard, Room 108
Houston, Texas 77056
Visitor Parking $5.00 – Enter from Guilford Court

Please make your reservations on-line www.hgs.org

For more information about this event, contact HGS Office 713-463-9476 • office@hgs.org

HGS General Dinner Meeting continued from page 15

for at least 3 million years. These lake (and associated fluvial and deltaic) sediments underwent multiple episodes of diagenesis suggesting groundwater was present for long durations. The presence of cemented sedimentary strata that overlie angular unconformities show that significant fractions of the 152-km-diameter crater were filled with water-cemented sediments and then largely evacuated by wind at least twice prior to ~3 billion years ago.

Curiosity has also shown that early Mars had more igneous diversity than previously predicted, eolian bedforms with distinct wavelengths formed under different atmospheric conditions and today has active sand dunes and seasonal variations in atmospheric methane.

Professor Siebach will present the developing story of the history of the Gale crater basin and the basin analysis work she has done to understand source-to-sink processes by separating chemical effects from source rock diversity, sediment transport, and diagenetic influences for multiple sedimentary cycles. ■

Biographical Sketch

Kirsten Siebach is an Assistant Professor in the Department of Earth, Environmental, and Planetary Sciences at Rice University. Her work focuses on understanding the history of water interacting with sediments on Mars and early Earth through analysis of sedimentary rock textures and chemistry. She is currently a member of the Science and Operations Teams for the Mars Exploration Rovers and the Mars Science Laboratory.

Kirsten attended Washington University in St. Louis, where she graduated summa cum laude with a BA in Earth & Planetary Science and Chemistry. She completed her PhD in Geology at Caltech under Dr. John Grotzinger. Her dissertation study "Formation and Diagenesis of Sedimentary Rocks in Gale Crater, Mars" was followed a postdoctoral research in geochemistry of Martian sediments at Stony Brook University.

She is actively engaged in promoting education and outreach related to Earth and Planetary science and regularly presents at schools and outreach events. Outside of professional interests, she loves travel and photography (on Earth as well as Mars), and enjoys swimming, hiking, and social dancing.

Upstream Oil & Gas Professionals Hiring Event

March 27, 2018 • 10am to 3pm
Trini Mendenhall Community Center • 1414 Wirt Rd., Houston, TX 77055
http://www.pct3.com/community-centers/mendenhall-community-center/

The Members-in-Transition committee invites you to participate in the third edition of the Upstream Oil and Gas Professionals Hiring Event. Following the success of the March 2017 inaugural event we continue to provide a platform for connecting experienced job seekers with oil and gas companies with open positions.

Job Seekers: Around 40 companies are expected at the Hiring Event! Meet with employers hiring for professional upstream positions. Stay tuned for registration details and upcoming guidance sessions to help you maximize your success at the Hiring Event.

Employers: A booth at the Hiring Event presents an ideal opportunity to fill your job vacancies while providing valuable exposure for your company. Hundreds of high-quality experienced individuals in the upstream oil and gas industry are expected to attend.

Sponsors: Sponsorship for the Hiring Event will help build your name, image, and pride by supporting an event that helps fuel and sustain the oil & gas industry in the Gulf Coast section.

Collaborating Organizations: Professional organizations with a common interest to support their members during career transitions can provide value to their members by participating in the Hiring Event.

Event Contact Info: Bob Merrill and Ramesh Anand, Co-chairs. spegcs.mit.hiringevent@gmail.com 713-409-7340/281-403-6070

PRICING
Employer: Pricing is based on number of employees. Less than 50 = $100; between 51 and 1000 = $500; more than 1000 = $1000
Sponsors: Options include Bronze = $200; Silver = $300; Gold = $500; Platinum = $1000; Diamond = $2000 (need not be an employer to sponsor)
Job Seeker: registration fee of $5 opens February 23, 2018

SPE Registration Link:
Employer: https://www.spegcs.org/events/3829/
Job Seeker: Job Seeker registration opens February 23, 2018

Wednesday, March 14, 2018

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $30 Preregistered members; $35 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

Harry Behzadi, PhD
Vice President,
Business Development
North America SGS

ETHICS MOMENT

We will dedicate 15 minutes at the beginning of each meeting to ethics to apply towards 0.25 hours of ethics credit.

Emerging Contaminants: Perfluorinated Alkylated Substances (PFAS)

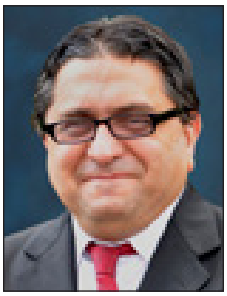
PFAS are a class of synthetic fluorinated chemicals used in many industrial and consumer products, including defense-related applications. They are persistent and can be found at low levels in the environment, and bio-accumulate.

The sources that can release significant quantities of PFAS into the environment could be industrial and municipal wastewater treatment plants (e.g. from textile industry, chrome-plating industry), landfill leachate treatment plants, fire-fighting incidents and fire-fighting training areas (e.g., at airports, fuel production and storage facilities) and landfills.

Human exposure to PFAS is primarily by ingestion of contaminated foods or water. These compounds are not metabolized, bind to proteins (not to fats) and are mainly detected in blood, liver and kidneys. Elimination of PFOS, PFHxS and PFOA from the human body takes years, whereas elimination of shorter chain PFAS is in the range of days. As a result the EPA is primarily focused on the long chain PFAS compounds. Concern around the environmental effects of PFAS use began in the late 1990s when it was realized (due to their resistance to biodegradation) PFOS and PFOA were ubiquitous in various biological (wildlife and humans) and environmental (water bodies) matrices.

Solid phase extraction and liquid chromatography / tandem mass spectrometry (LC/MS/MS) is used to determine the majority of PFAS compounds although specific precautions are required in sampling of environmental media since PFAS adsorb strongly to glass. Teflon-containing materials can also lead to an increased background level. Currently the most appropriate material for sampling seems to be using polyethylene or polypropylene. ■

Biographical Sketches



Dr. Behzadi is currently Vice President of Business Development for SGS-EHS North America. Most recently he was the Vice President of Operations, for TestAmerica Inc Eastern region. Prior to joining SGS he was VP of operations and Corporate Technical Director for Accutest Laboratories, Inc. Since 1994 Dr. Behzadi had spearheaded growth and expansion of Accutest Corporation in the Southeast and beyond to the West Coast. He started Southeast division in 1995 and developed the lab from a handful of employees to one of the largest environmental laboratory in the South with staff 90+ strong. He began his career in the pharmaceutical industry and has been responsible for laboratory management, analytical method development, professional training and QA/QC in both the environmental and pharmaceutical industries. He has navigated multiple laboratories (Dept. of Defense and Fortune 500 Companies) through certification and NELAP accreditation process. His expertise encompasses all aspects of the environmental testing business including technical and operations management, new method development, acquisitions, operations integration, sales and business development.

Education: Rutgers University, Newark, NJ PhD, Analytical Chemistry, 1992
Rutgers University, Newark, NJ MS, Chemistry, 1985
Montclair State College, Montclair, NJ BS, Biology and Chemistry, 1982

HGS Shrimp Peel & Crawfish Boil

Friday April 20, 2018
12:00 noon – 6:00pm

Bear Creek Pioneers Park
3535 War Memorial Street, Houston, TX 77084

Boiled Shrimp – Boiled Crawfish
(Corn & Potatoes)
Beer & Beverage – Live Music

HGS Member pre-order $30
Non-member pre-order $35
Walk ups (if available) $45

Register online at WWW.HGS.org
https://www.hgs.org/civicrm/event/info?id=1783

Sponsorship Opportunities

Shrimp Sponsor $2000.00 - 4 Complimentary event tickets
Crawfish Sponsor $2000.00 - 4 Complimentary event tickets
Beer & Beverage Sponsor $1000.00 - 2 Complimentary event tickets
Live Music Sponsor $1000.00 - 2 Complimentary event tickets
Platinum Corporate Sponsor $1000.00 – 2 Complimentary tickets
Gold Corporate Sponsor $750.00
Silver Corporate Sponsor $500.00
Bronze Corporate Sponsor $250.00

To be a Sponsor please call Andrea Peoples at the HGS Office 713-463-9476 or email andrea@hgs.org

Tuesday, March 20, 2018

Southwestern Energy Conference Center, 10000 Energy Drive, Spring, TX 77389
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: $35 Preregistered members; $40 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
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HGS Northsiders Luncheon Meeting

Carlos Molinares-Blanco
The University of Oklahoma Institue of Reservoir Characterization

Organic-rich Woodford Shale Deposits and the Spread of Vascular Plants During the Late Devonian

The Late Devonian is a period characterized by the widespread accumulation of organic-rich black shale deposits in North America. The Woodford Shale in Oklahoma is a good example of these type of accumulations (Algeo et al., 2007). The Woodford is generally characterized as organic rich, black shales deposits, accumulated during the presence of anoxic/euxinic conditions, in circulation restricted and relative shallow (epicontinental) marine paleo-environments (Miceli-Romero and Philp, 2012; Slatt et al., 2012; Turner et al., 2015). It is one of the most prolific oil and gas resources in North America and it has been estimated a total of 22 billion barrels of bitumen and 16 billion barrels of saturated hydrocarbons expelled from the Woodford across the central and southern areas of Oklahoma (Comer and Hinch, 1987).

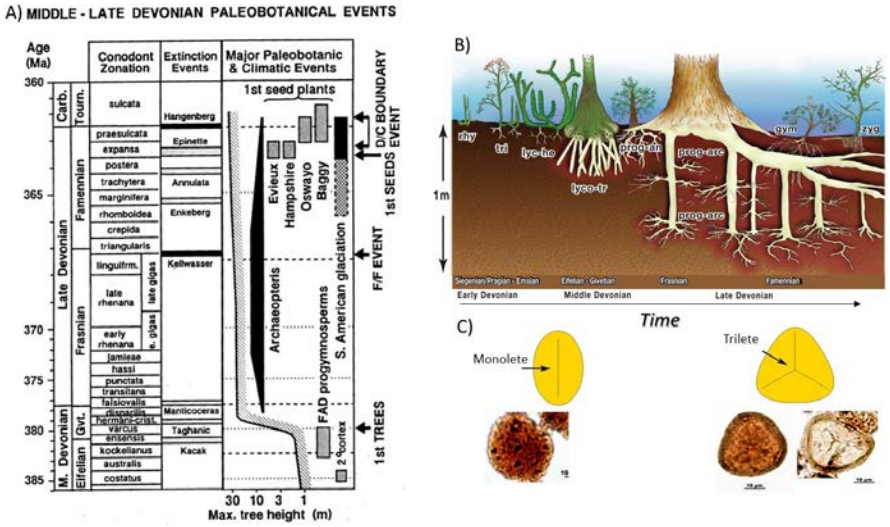

Figure 1 *a) Middle to Late Devonian Paleobotanical events associated with the arborescence and the development of seed habit. b) The spores are commonly subdivided in monolete and trilete spores. The trilete spores are expected to increase during Late Devonian because trilete spores are commonly associated with vascular plants (Steemans et al., 2009), and the evolutive innovation related to the arborescence and development of complex root systems plants such as* Lycopods (lyco-) *and* Progymnosperm (prog-) *during Late Devoian c) Monolete and trilete spores from Woodford Shale samples. (Modified from Algeo and Schecklet, 1998).*

During Late Devonian vascular plants appeared on continental dry land areas as well as trees with complex root systems that are preserved on fossil record (Algeo and Scheckler 1998; 2001). The continental plants increased in size from two evolutionary innovations: The arborescence or tree-sized high and second, the development of seed habit (**Figure 1**). Primitive plants include *Lycopods, Cladoxylaleans* and *Progymnosperm* trees and other plants related to the oldest vascular plants on earth, including the *Archaeopteris spp*, which petrified silicified tree logs are commonly well preserved on Woodford Shale outcrops in Oklahoma (Cardott and Chaplin, 1993).

Eutrophication occurs when marine (or lake) ecosystems experience an excess of nutrients that stimulates the excessive growth of primary producers creating anoxic sea bottom conditions conducive to the accumulation of organic-rich, black shale deposits (Passey et al., 2010). Changes in the weathering processes due to the spread of vascular land plants in late Devonian has also been related to increase flux of river-borne nutrients into epicontinental seas, producing a subsequent eutrophication and oceanic-bottom anoxia (Algeo et al., 1994).

The spreading of vascular plants and the enhanced chemical and physical weathering rates are associated with a significant decline in atmospheric CO_2 levels (**Figure 2**) and the extinctions of corals and stromatoporoids reef-builders during that period (McGhee, 1996). The sequestration of significant atmospheric CO_2 levels is also related to positive Carbon isotopic excursion events described for the Frasnian/Famennian (F/F) (Lower and Upper Kellwasser events), and the Devonian/Carboniferous (D/C) boundaries (Hangenberg event) (e.g. Walliser 1996; Joachimski et al., 2002; Saltzman 2005).

This work shows a compilation of $d^{13}C$ stable isotopes, biomarkers, palynology, thin sections, XRD and XRF element compositional analysis from Woodford **HGS Northsiders Luncheon** *continued on page 22*

HGS Northsiders Luncheon Meeting continued from page 21

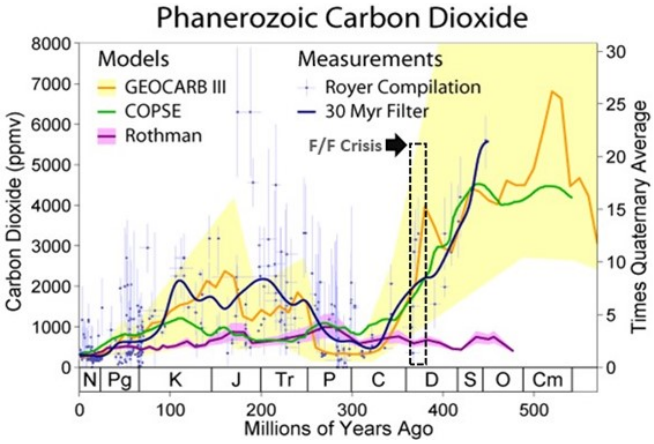

Figure 2. *Changes in carbon dioxide concentrations during the Phanerozoic from different compilation studies:Rothman 2001, Berner and Kothavala 2001 (GEOCARB III), Bergmann et al., 2004 (COPSE), and Royer et al., 2004. Error bars and error envelops (yellow bands) are shown when they are available. Notice the significant decrease on atmospheric carbon dioxide (C02) during the Late Devonian, Frasnian/Famennian (F/F) crisis, ~370 Ma (After Robert A. Rohde).*

Shale rocks cored by the Wyche-1 well, Lawrence Uplift, Pontotoc Co., Oklahoma (Slatt et al., 2012). The core is subdivided into Welden Shale and Lower, Middle and Upper Woodford intervals and nine (9) lithofacies are identified based on core, XRD, XRF and thin section analysis (**Figure 3**). The facies are grouped on regressive-transgressive cycles, based on Total Organic Carbon (TOC) and gamma ray contents, and ratios between continental (pollen grains) and marine algaes (tasmanites + acritachs) palynomorph assemblages.

A series of positive isotopic Carbon excursion events identified in some samples from the Middle and Upper Woodford Shales were correlated with the Kellwasser (F/F Boundary) and Hangenberg (D/C Boundary) anoxic events (**Figure 4**) using temporal constraints of conodont assemblages reported from adjacent localities (Over, 1992, 2002). The permanent anoxic/euxinic sea water conditions during the accumulation of the Middle Woodford Shale, based on the presences of C_{40} Carotenoids and Aryl-Isoprenoid biomarker compounds (Miceli-Romero and

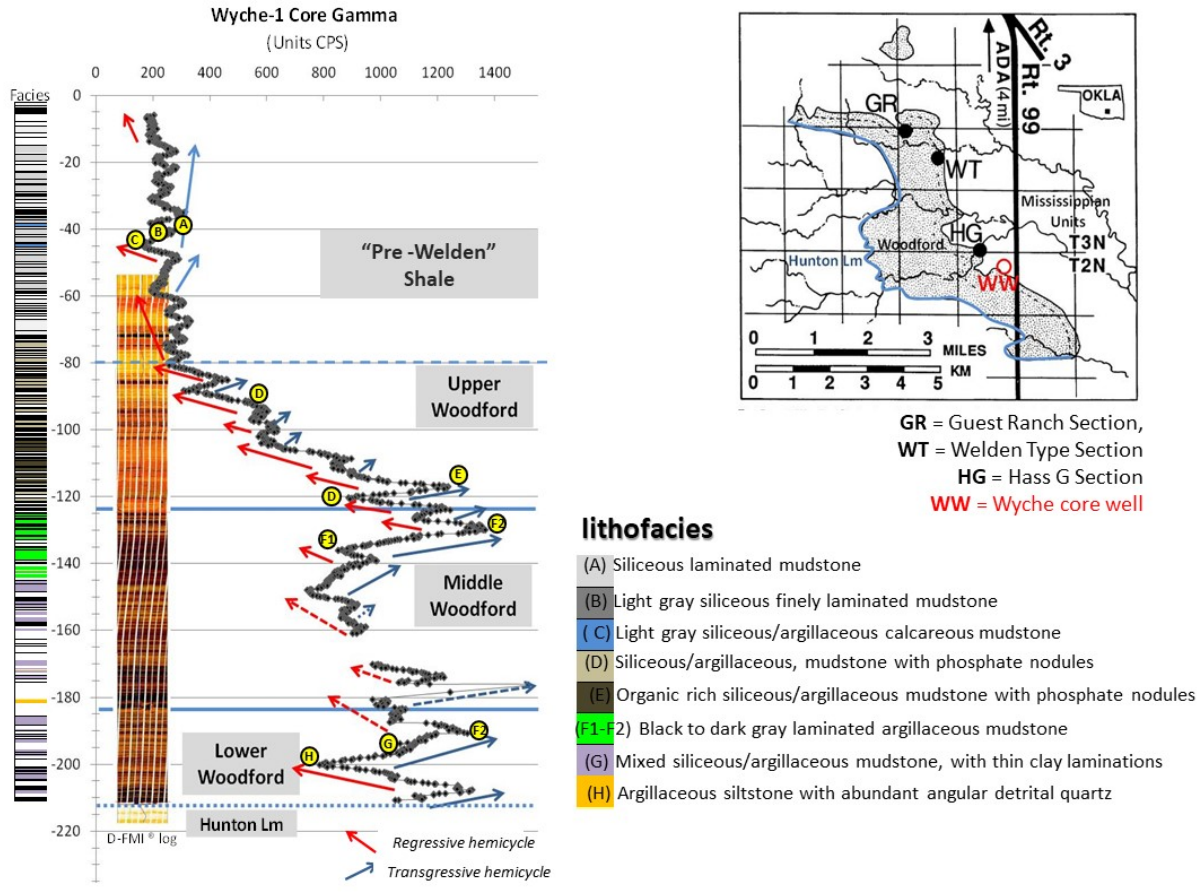

Figure 3. *Wyche-1 well location ~4 miles southern Ada, Oklahoma. Other localities with a previously detailed conodont description are also illustrated (Over, 1992; 2002). The Woodford in the Wyche-1 core was subdivided into Welden Shale and Lower, Middle and Upper Woodford intervals and nine (9) lithofacies were identified based on core, XRD, XRF and thin section analysis. The regressive-transgressive cycles were also supported by ratios between continental (spores) and marine algaes (tasmanites + acritachs) palynomorph assemblages.*

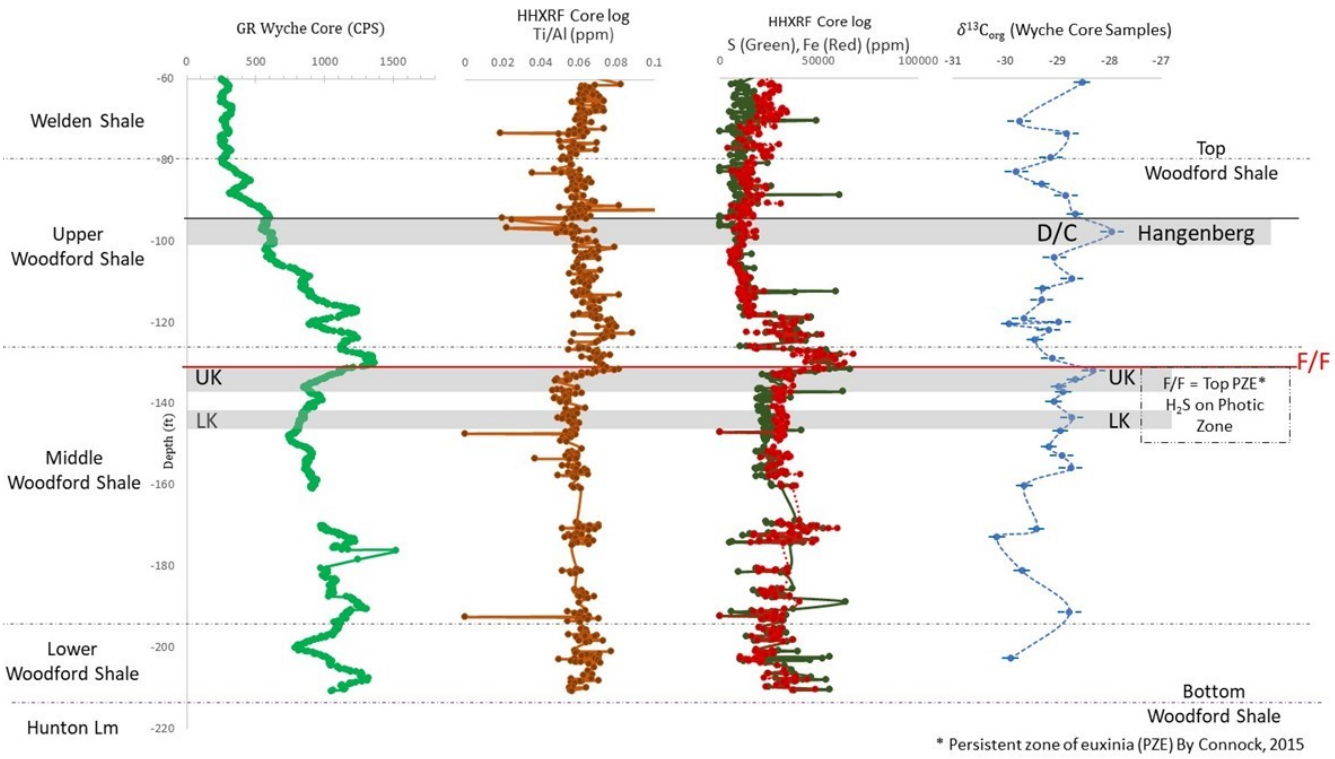

Figure 4a. *Core Gamma Ray (GR) in counts per second (CPS) from the Wyche-1 well core. Normalized Titanium (Ti) / Aluminium (Al) ratios, Sulphur (S) and Iron (Fe) contents from HH-XRF based on Turner et al., 2015. The positive (δ13Corg) Carbon excursion events identified from the Upper and Middle Woodford Shale correspond with the Frasnian/Famennian (F/F), Upper (UK) and Lower (LK) Kellwasser anoxic events.*

Philp, 2012; Connock 2015), and the positive isotopic excursion events support the idea that the organic-rich, Middle Woodford Shale interval is related to the F/F anoxic event(s) described globally and possibly associated with the spreading of vascular plants during the same period. ■

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HGS Northsiders Luncheon *continued on page 25*

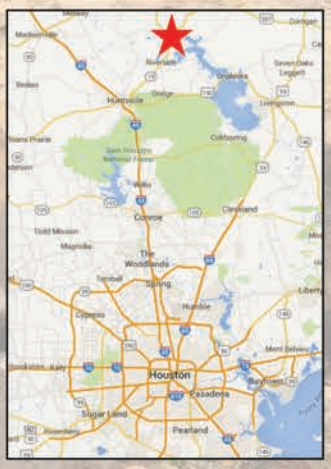
HGS Presents:

Take a kid to the outcrop family campout!

April 27 - 29, 2018
Camp Cullen YMCA in Trinity, TX

Come join fellow HGS members and their families for a weekend of fun! Activities include:

Interpreted quarry with hunts for fossils and petrified wood
Newly renovated geology lab with samples and flume
Gold panning
Zip line
Archery
Riflery
Arts & crafts
Marathon pipeline slide
Basketball
Gaga ball
Campfires



All of this and more, all only 1.5 hours north of Houston!

Check in Friday evening and check out Sunday morning. Cost is $110/person for up to 4 people. For families of 5+, call for a discounted rate. The fee includes overnight stay Friday and Saturday nights, 4 meals and all activities. Each family will have a private bunkhouse for up to 8 and private family bathroom in newly renovated cabins. For more information on the facilities, please visit the Camp Cullen website at https://www.ymcacampcullen.org/

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Call the HGS office at 713-463-9476

HGS Northsiders Luncheon Meeting continued from page 23

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Biographical Sketch

Carlos E. Molinares-Blanco is a PhD student at the University of Oklahoma in the Institute of Reservoir Characterization. He worked as South Texas development geologist for ConocoPhillips (2013-2015) focused on integrating geological, geophysical and historical production data for characterizing complex unconventional tight-gas reservoirs. He was responsible for OGIP/OOIP mapping, analyses of prospective intervals for supporting recompletion and propose new drilling locations. Prior to joining ConocoPhillips, he worked for Ecopetrol (Bogota - Colombia) as exploration geologist for from 2007-2011. He was responsible for regional studies, prospect identification, acreage acquisition and evaluation of new ventures opportunities in offshore basins; including Guajira, Sinu and Cayos Basins (Colombia), Santos and Espiritu Santo Basins (Brazil) and projects from the Green Canyon area, Gulf of Mexico (USA). Carlos received a BS degree in geology (with distinction) from the Universidad Nacional de Colombia (Bogota, Colombia) in 2004, a MSc in Earth Sciences from Universidad EAFIT (Medellin, Colombia) in 2007, and he also received a MSc and Ben Hare outstanding thesis award by the University of Oklahoma on May 2013. Carlos is interested on unconventional reservoir characterization, particularly understanding the origin and controls on the distribution of anoxic global events, including the Selli (OAE1) and Bonarelli (OAE2) Cretaceous events, and the Late Devonian, Kellwasser and Hangenberg events. Carlos is author/coauthor of more than 20 publications and presentations on AAPG, SEG, URTEC, SIPES, HGS and GSA.

Monday, March 26, 2018

New Location
Live Oak Room • Norris Conference Center • 816 Town and Country Blvd #210
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $40 Preregistered members; $45 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

Kurt Rudolph
Rice University and
University of Houston

Tectonic Forcing and Sedimentary Cyclicity: Impact on Petroleum System Elements

Sequence stratigraphy is an observationally-based method for interpreting sedimentary cyclicity. Stacking patterns of progradation, retrogradation, aggradation and degradation are related to the balance of sediment accommodation versus sediment supply. While often related to eustasy, accommodation is also controlled by tectono-subsidence (**Figure 1**). Based on over 50 global examples, regional subsidence and uplift rates are usually greater than rates of sea level rise / fall for durations greater than about one million years. Thus, the larger scale patterns of sedimentary cyclicity are related to tectonics in many basins.

Another important aspect of active tectonics is, unlike eustasy, it is spatially variable. For example, while basins may be subsiding adjacent areas may be uplifted (such as rift flanks in extensional basins or orogenic belts in foreland basins). This often drives basin differentiation, variations in sediment supply, development of silling / interior drainage and steepening of the depositional profile (**Figure 2**).

Tectono-subsidence controls on large sequence development and petroleum system play elements are illustrated by examples in the Western Interior U.S., North Slope Alaska, Western Siberia Basin, North Sea and East Natuna-Sarawak Basin.

Many of the world's most important petroleum source rocks (and regional seals) are associated with tectonic events which differentiated the basin and increased subsidence rates. This can result in marine transgressions (leading to condensed intervals / concentration of organic matter), steepening of the profile (enhancing upwelling / productivity), and basin restriction (enhancing the potential for anoxia / preservation). Another important aspect is tectonic steepening of the depositional profile created by differential subsidence and/or uplift. This enhances the potential for submarine fan development, especially as subsidence wanes. Periods of decreased subsidence (or uplift) are associated with strongly progradational / degradational stratigraphic intervals. The resultant lowstands are a means of bypassing sands into the basin and are potentially reservoir-prone intervals (**Figure 3**). ■

Biographical Sketch

Kurt Rudolph received a BS in Geology from Rensselaer Polytechnic Institute and an MA in Geology from the University of Texas. He began his career as an Exploration Geologist with Unocal in 1978, then joined Exxon Production Research in 1981. Kurt held a variety of positions in Exxon/ExxonMobil, including Chief Geoscientist from 2002-2015, retiring in April 2015. He was a co-recipient of the Wallace Pratt Award for the best AAPG Bulletin paper for 1992 and the AAPG-SEG Distinguished Lecturer for 2001-2002. Kurt was the AAPG Michael Halbouty Lecturer for 2007 and received best paper award from the Rock Mountain Association of Geologists in 2015. He is currently an Adjunct Professor at Rice University and the University of Houston. His interests include stratigraphy, seismic interpretation, and regional geology.

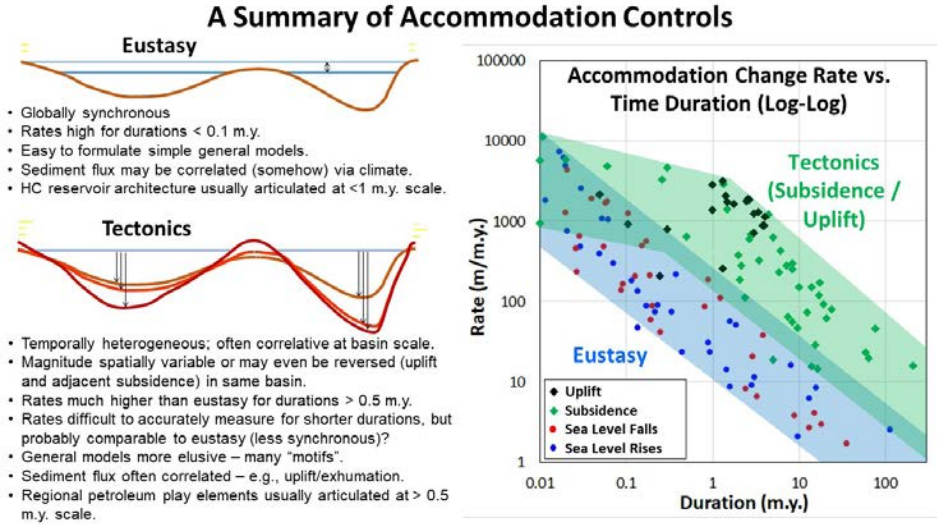


Figure 1

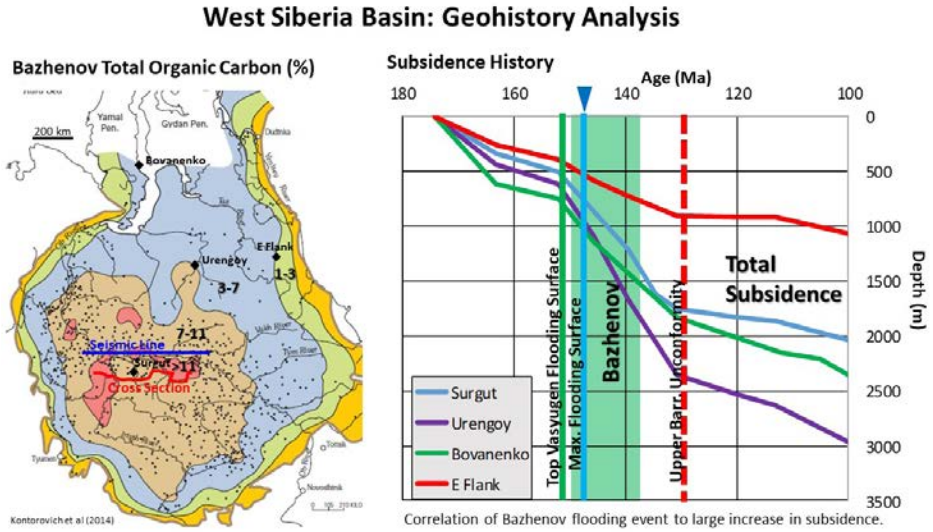


Figure 2

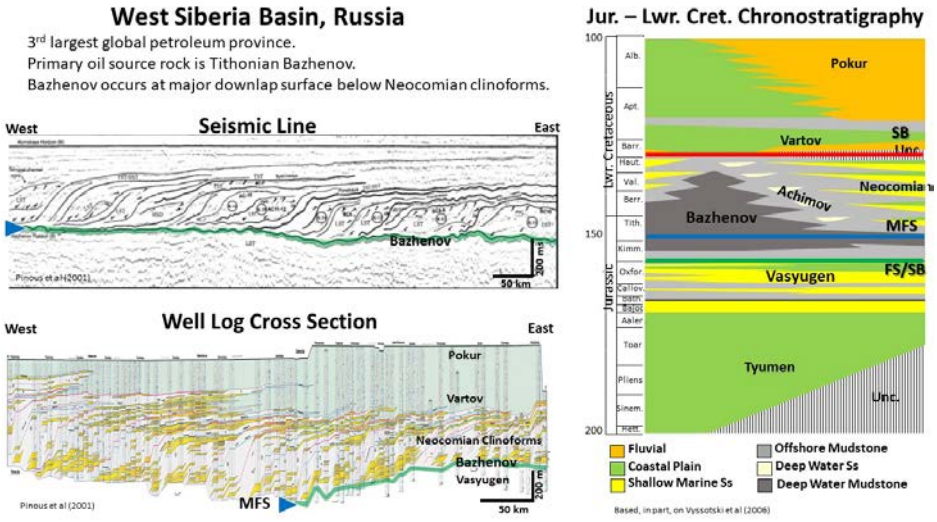


Figure 3

Microbial Carbonates in Central Texas Field Trip

Microbes are defined as microorganisms visible only under a microscope. Some examples are bacteria, fungi, molds, algae, and protozoa. Microbial sediments have always attracted the attention of sedimentologists and paleontologists, but in recent years the discovery of large oilfields in microbial carbonate reservoirs has generated renewed interest in these rocks, especially in the environments in which microbial carbonates form and the characteristics that make them good reservoirs. What used to be classified as "algal" is now classified as microbial or calcimicrobial. The older classification of living things that included kingdoms of animals and plants has been supplanted by a scheme that puts all living things into three main branches called "domains" of life – Bacteria, Archaea, and Eukarya. Bacteria, including cyanobacteria, and Eukarya, red and green algae and fungi, are the principal "actors" involved in the formation and diagenesis of microbial carbonates.

March 22 – 25, 2018
Limited space for 23 participants!
Registration opens in January 2018
Trip Leader: Dr. Andre Doxler,
Rice University Professor

Most microbial sediments and rocks are carbonates. Some of the most spectacular examples are found in Upper Cambrian carbonates of Central Texas – microbial buildups and associated facies in the Point Peak and San Saba members of the Wilberns Formation. Point Peak and San Saba outcrops in Central Texas expose some of the best preserved Cambrian microbial carbonates anywhere. These microbial limestones have not been tectonized and their depositional fabrics and textures have been remarkably well preserved with only minor dolomitization in some stromatolitic and oolitic facies. Thin section study of the microbialites reveals four different calcimicrobes; Girvanella, Epiphyton, Renalcis, and Nuia.

Point Peak and San Saba rocks outcrop around much of the Llano Uplift (a structural dome with its cover removed to form a topographic basin). The best exposures are in the western part of the area in Gillespie and McCulloch Counties, extending from the Doss settlement in the southwest to the San Saba River in the north. Because it is not always easy to get access to outcrops on private land in the Texas Hill Country, this field trip takes advantage of excellent exposures along segments of the Llano and San Saba Rivers, where we have access. The Llano River portion of our trip will be done from kayaks making it even more interesting and exciting.

One day of the trip will be by kayak, starting at White's Crossing near Mason, Texas. We will see famous exposures of microbial buildups in the Point Peak Member, Wilberns Formation. As we paddle downstream, we will have close-up views of microbial bioherms that have fallen into the river from the surrounding cliffs. As we pass gradually up-section through the Point Peak, we will have a chance to get out on the riverbank to see a variety of sedimentary structures, including mud cracks and flat-pebble conglomerates, some of which are "edgewise" conglomerates formed by strong eddy currents that spun the flat pebbles into accumulations that look like "pinwheels." Our lunch stop will provide an opportunity to walk over a continuous exposure of stromatolitic and thrombolitic microbialites. After lunch we will see microbial bioherms with superb stromatolite accumulations at water level. This location offers a chance for close-up photos of stromatolites in cross-section. As we near the end of our float, we will be passing out of the Point Peak and through the San Saba Member of the Wilberns Formation.

The second day of the trip includes an excursion to the US Highway 87 crossing on the San Saba River. After arriving by car, we will walk along the river on both sides of the bridge to examine large ripple marks in grainstones of trilobite-brachiopod hash and microbial bioherms in vertical succession, some with well-developed stromatolitic "capping sequences" as well as thrombolitic and laminar macrostructures that are present at this location. ■

Wednesday, March 28, 2018

Petroleum Club of Houston • 1201 Louisiana (Total Building)
Social Hour 11:15 a.m.
Luncheon 11:45 a.m.

Cost: $35 Preregistered members; $40 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

Grey Areas: Interactive Application of Business Ethics in the Geoscience Profession

John E. Jordan, Jr.

Most large oil companies require their employees to have yearly ethics training which is often broad and dry. Texas Board of Petroleum Geologists (TBPG) licensees are also required to have one hour of ethics training every year; this talk fulfills that requirement for 2018. Although I do not have a degree in philosophy or jurisprudence, I have been an international explorationist for 35 years and am aware of many situations where individual or business ethics were tested.

Two years ago, I gave a lecture introducing the theory of philosophical ethics exploring the difference between a moral compass, ethics and how this relates to business ethics. Last year we reviewed this model and then applied it to our industry with feedback from the audience via polling technology. This year I again plan to have a very brief review of the Ethics Model and focus on examples where your business ethics are tested. I need to hear from you to make this experience more meaningful. Please submit ethics examples you have encountered in your career to the HGS office by March 21st to be considered for use in the lecture. Examples will be anonymous and the situation will be modified, but the issue will be the same as submitted. Using the examples, the audience will provide immediate digital feedback while we discuss Business Ethics focusing on making sound, consistent and ethical decisions. Come and join this entertaining and spirited discussion about the "grey areas" and make sure to bring a phone that is capable of texting. The HGS will provide all participants with an Education certificate. ■

Biographical Sketch

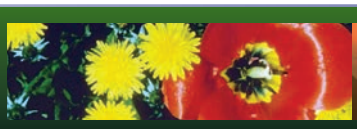
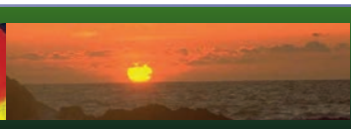
John E. Jordan, Jr. is a Past President of the HGS and a licensed geoscientist in Texas. He is a retired Project Geophysical Advisor who has worked for several Fortune 500 oil companies in California and Texas. Prior to joining Anadarko in 2007 he worked at Kerr McGee, Noble Energy, Arco and Chevron. During 30+ years in the oil industry John has worked deep-water and onshore projects in Alaska, Gulf of Mexico, Middle East, Asia, Africa and South America. John is a graduate of Wright State University where he received both a BSc and an MSc from the College of Science and Mathematics majoring in geology and geophysics. He does not hold degrees in philosophy or jurisprudence but enjoys lively debate on most any subject.

Nomination for HGS Teacher of the Year Award

The HGS Teacher of the Year Award has been established to honor individuals whose extraordinary efforts or unique contributions are in earth science education. The selected Teacher is given a $500 cash award along with a plaque presented at a HGS Event. The HGS Teacher of the Year will be encouraged to apply to the GCAGS and AAPG Teacher of the Year Programs which offer greater cash bonuses ($1500 and $5000 respectfully). Send requests or questions for requirements and procedures for award applications to Mike Deming HGS Awards Chairman at mike.deming.HGS@gmail.com.

All application materials must be mailed by April 1, 2018 to the HGS Office at: Houston Geological Society, Attn: Awards Chairman, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916. ■

March 2018

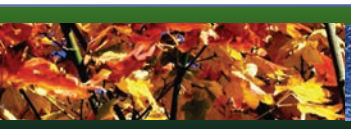
Sunday	Monday	Tuesday	Wednesday

Reservations:
The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail office@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event**. If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**

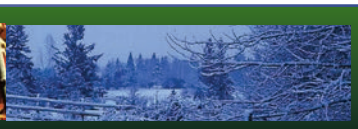
Members Pre-registered Prices:

Dinner Meetings members	$40
Emeritus/Honorary members	$40
Student members	$10
Nonmembers & walk-ups	$45
Except - Env. & Eng.	$30
Nonmembers & walk-ups	$35
Emeritus/Honorary members	$15

4	5	6 **HGS Applied Geoscience Conference** *The Woodlands* *Page 4,* **HGS Board Meeting** *6 p.m.*	7
11	12 **HGS General Dinner Meeting** *"Sedimentary Records from Another World: Exploring Gale Crater Basin with the Curiosity Rover,"* *Kirsten Siebach* *Page 15*	13	14 **HGS Environmental & Engineering Dinner Meeting** *"Emerging Contaminants: Perfluorinated Alkylated Substances (PFAS),"* *Harry Behzadi, PhD* *Page 19*
18	19	20 **HGS Northsiders Luncheon Meeting** *"Organic-rich Woodford Shale Deposits and the Spread of Vascular Plants During the Late Devonian,"* *Carlos Molinares-Blanco* *Page 21*	21
25	26 **HGS International Dinner Meeting** *"Tectonic Forcing and Sedimentary Cyclicity: Impact on Petroleum System Elements,"* *Kurt Rudolph* *Page 26*	27 **AAPG Super Basins Conference** *Houston* *Page 6*	28 **HGS General Luncheon Meeting** *"Grey Areas: Interactive Application of Business Ethics in the Geoscience Profession,"* *John E. Jordan, Jr.* *Page 29*



GeoEvents



Thursday Friday Saturday

1 Don't wait, make your reservations online at hgs.org	2	3
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22 **Microbial Carbonate Field Trip** *Central Texas* *Page 28*	23	24
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March 6-8, 2018
HGS Applied Geoscience Conference
Integrated Approaches of Unconventional Reservoir Assessment and Optimization
The Woodlands, TX (Page 4)

March 22-25, 2018
Microbial Carbonate Field Trip
Central Texas (Page 28)

March 27-29, 2018
AAPG Super Basins Conference
Houston, Texas (Page 6)

April 20, 2018
HGS Shrimp Peel and Crawfish Boil
Bear Creek Pioneers Park
Houston, TX (Page 20)

April 27-29, 2018
Take a Kid to the Outcrop Ffamily Campout
Camp Cullen YMCA
Trinity, TX (Page 24)

September 11-12, 2018
The 17th HGS-PESGB Conference on African E&P
Houston, TX (Page 2)

Renew Your HGS Membership HGS.ORG

Candidates for the 2018–2019 Executive Board

Houston Geological Society Officer Election

The candidates put forth by the Nominations Committee are:

President - Elect: Jon Blickewede, Justin Vandenbrink

Vice President: Geoffrey Haddad, Penny Patterson

Secretary: Tami Shannon, April Parsons

Treasurer-elect: Ryan Yarrington, Annie Walker

Editor-elect: Fang Lin

Directors (2 positions):
Mike Alison, Brent Boyd, Bryan Guzman, Rachel Todkill

HGS Election Voting Instructions

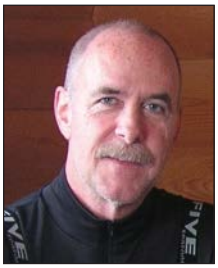
Members will be able to vote in one of two ways:

1. Return the paper ballot that will be delivered in the mail, *OR*
2. Vote online following instructions that will be delivered by e-mail.

PLEASE VOTE – Upon receiving the paper ballot or the e-mailed instructions!

The voting period opens April 10, 2018 and continues to May 10, 2018.

President-elect (two candidates)



Jon Blickwede

Education
University of New Orleans, MS
Earth Sciences 1981
Tufts University, BS Geology 1978

Experience

2017-present	Teyra GeoConsulting LLC - Founder and Chief Geologist
2005-2017	Statoil - Exploration Geologist
2002-2005	Unocal/Chevron - Exploration Geologist
1997-2002	IHS - Manager, Mexico, Central America & the Caribbean
	The Andrews Group/ AGI Mexicana - Manager of Geoscience
1981-1997	Amoco - Exploration Geologist

Professional Affiliations and Activities
Houston Geological Society (HGS Bulletin Editor-elect/Editor 2014-2016)
AAPG (Chairman, Secretary of Publication Pipeline Committee 2011-present; Co-chair, Deepwater Frontiers technical session, 2004 ICE, Cancun, Mexico)
GCAGS (co-organizer, symposium on Petroleum Systems of Northern Deepwater Gulf of Mexico, 2004 Annual Convention, San Antonio)
Gulf Coast Section-SEPM (Technical Committee Co-chair, 1989 Perkins Conference; co-convener of 2007 Perkins Conference)
New Orleans Geological Society (Chairman, Short Course Committee 1983-1985)

Jon Blickwede *continued on page 38*

Justin Vandenbrink

Education
University of British Columbia - Bachelor of Science, Geology, 1995
British Columbia Institute of Technology - Diploma, Broadcast Journalism 1998

Work Experience

2017	Director, Geologic Products and Services, TGS
2016	Technical Director, Core Group Resources
2012 - 2016	Petroleum Consulting, Weatherford
2001 - 2011	Petroleum Consulting, RPS Energy
1996	Mining Exploration Geologist, INMET
1995	Petroleum Exploration Geologist, Renaissance Energy

Society Experience

2017 - 18	Secretary/Editor Delegates Voice, AAPG
2016 -19	HoD delegate for HGS
2016 -18	HoD Honors and Awards Committee, AAPG
2015 -16	HoD Foreman, HGS
2015 -17	Board Director, HGS
2012 -13	Vice President, HGS
2008 -12	Chairman, International Explorationists, HGS
2008	Joined HGS
2007	MC, Ring Ceremony and Induction Weekend, APEGA
2005	Joined APEGA
1994	Joined AAPG

Additional AAPG activities

2017	HGS Tennis Tournament, Director

Justin Vandenbrink *continued on page 39*

Candidates for the 2018–2019 Executive Board *(continued)*

Vice President (two candidates)

Geoffrey Haddad

Education
BA Geology, Rice University, 1982
MS Geology, Duke University, 1986
PhD Geology, Rice University, 1994

Professional Affiliations:
HGS; AAPG; SEPM; GCSSEPM

Boards
Rice University Professional Science Master's Board of Affiliates.

Professional & Academic Experience

1982-1983	Exploration Geologist - Superior Oil - Houston
1986-1987	Exploration Geologist - Exxon Exploration - Houston
1994-1995	Research Associate & Lecturer - Rice University - Houston
1995-1996	Research Associate - CNRS Lab - Gif sur Yvette, France
1996 - 1997	Postdoctoral Fellow - Houston Advanced Research Center
1998 - 2001	Stratigrapher - Elf / TotalFinaElf Technology - Pau, France
2001 - 2006	Stratigrapher - ConocoPhillips Technology - Houston
2006	Chief Geologist DW Gulf of Mexico - ConocoPhillips - Houston
2006 - 2008	Exploration Manager DW Gulf of Mexico - ConocoPhillips - Houston
2008 - 2011	Exploration Manager Alaska - ConocoPhillips - Anchorage
2011 - 2013	Manager Geological Technology - ConocoPhillips - Houston
2013 - 2016	Manager Senegal Exploration - ConocoPhillips - Houston
2016 - Present	Geological Fellow - ConocoPhillips - Houston

Statement
I have had the good fortune of having a career that has led me in and out of academic, technical and management roles in the oil Industry. I have enjoyed and learned a great deal from each of these roles. Reflecting on my career I've realize three strengths that made my career rewarding: 1) strong and relevant technical

Geoffrey Haddad *continued on page 39*

Penny E. Patterson

Education
1990, PhD, Geology, University of Colorado
1981, MS, Geology, University of Colorado
1976, BA, Geology, University of Colorado

Experience

2016	Present: Senior Technical Advisor, ExxonMobil Production Company
2013 - 2016	Senior Technical Advisor, ExxonMobil Development Company
2006 - 2013	Senior Geoscience Advisor, ExxonMobil Exploration Company
1990 - 2006	Senior Research Geologist, ExxonMobil Upstream Research Company
1981 - 1986	Geologist, Research Planning Institute
1975 - 1976	Field Assistant, USGS

Professional Affiliations
HGS (15 years); AAPG (35 years); SEPM (35 years); GSA (35 years)

Professional Activities

2007 - Present	Advisory Board Member: University of Colorado, Department of Geological Sciences
2014 - 2016	Houston Geological Society: Director

Statement:
The Houston Geological Society is a vibrant and integral organization in our geoscience community that provides critical resources to our members through HGS technical meetings and conferences, publications, networking social functions, and the HGS website. As an HGS Director, I was involved with seven educational committees, which provide exceptional training and learning opportunities for geoscientists of all ages, including our young K12 scientists, industry and academia scientists, and our retired scientists. It is this dynamic engagement of our community that continues to advance and transfer our excellence in geoscience.

I enthusiastically support HGS and enjoy the camaraderie and benefits of networking with fellow geoscientists. The HGS technical meetings, seminars, and workshops are all vital to our geoscience community and provide a sounding board and exchange for news ideas and technologies. I was honored to be

Penny E. Patterson *continued on page 39*

Candidates for the 2018–2019 Executive Board *(continued)*

Secretary (two candidates)

April Parsons

April began her career at Marathon oil working International Exploration on a variety of projects including Kenya, Syria, Gabon, Tunisia, North Sea and Timor Gap. She worked in Midland as the geologist responsible for the Delaware Basin handling a variety of operated and outside operated fields, exploitation and lease sale evaluations. She holds both a Master of Science and Bachelor of Science in Geology from University of Texas at Arlington.

She has been the team lead for Hydro GOM, LLC's shelf exploration where she managed a team responsible for prospect generation, maturation, drilling and evaluation. After the Statoil acquisition of Hydro, April worked to package and sell assets to Mariner. She has also worked exploration projects in the Gulf of Mexico shelf for El Paso, Coastal and Marathon Oil. Through 2013 April worked for Statoil in the Houston office and was responsible for Statoil's interests in the Chukchi Sea of Alaska and handled all geologic aspects of maturing the newly acquired frontier leases to drillable status. Before taking on the Alaska project she worked the deep water eastern Gulf of Mexico.

April joined Cobalt in 2013 and was involved in the planning, drilling and post well evaluation of almost all of Cobalt's wells in the Pre-Salt Kwanza Basin as well as and being responsible for assessment and appraisal of the Orca discovery in Block 20. Recently she has been working the deep water Gulf of Mexico inboard lower Tertiary Wilcox evaluating the depositional history of the North Platte discovery, Shenandoah Field during appraisal and towards filing of a SOP as well as the Heidelberg Field.

April has been a member of HGS and AAPG for many years and currently serves on the House of Delegates and the Grants in Aid Committee, and it would consider it a pleasure to continue that service as secretary of the local organization.

Tami B. Shannon

Education

Texas A&M University - Corpus Christi - Master of Science Degree, Environmental Science, 2007

Winona State University - Bachelor of Science Degree, Hydrogeology, 1997

Experience

1997-2000	Systems Engineer, CompuCom Systems
2001-2003	Transportation Engineer, Wilbur Smith Associates
2003-2006	GIS Technician, City of Corpus Christi
2006-2007	GIS Analyst, UT Marine Science Institute
2007-2010	Senior GIS Analyst, Deloitte - Petroleum Services Group
2010-2012	GIS Coordinator, Fugro GeoConsulting, Inc.
2012-2014	Senior GIS Programmer/Analyst, Resource Data Inc
2013-2014	GIS Application Developer, Gulf Interstate Engineering
2014-2015	GIS Project Lead, RPS Knowledge Reservoir
2015-2017	GIS Application Systems Expert, Oxy, Inc
2017-Current	International Appraisal Data Lead, Oxy, Inc.

Professional Affiliations

Houston Geological Society
Geophysical Society of Houston
Texas Board of Professional Geoscientists GIT #46

Professional Activities & Awards

2018-2019	Candidate for HGS Secretary
2016-2017	HGS President's Award
2016-2017	Editor, HGS Bulletin
2015-2016	Editor-Elect, HGS Bulletin

Statement

Thank you for considering me for your 2018-2019 HGS Secretary. I have been a member of HGS since 2007, when I first moved to Houston and learned of this esteemed organization. As a "silent" member for many years I participated in numerous meetings and events, but in 2015, it was an honor to have the HGS membership elect me HGS *Bulletin* Editor for 2016-2017. I worked closely with the HGS Board and its talented volunteers for over two years to gain great knowledge of the Society and to understand the Board's objectives and inner workings. As a nominee for HGS Secretary for 2018-2019, I am confident my previous experience as HGS Editor and Board member would make me an excellent candidate for this honored position. ■

Candidates for the 2018–2019 Executive Board *(continued)*

Treasurer-elect (two candidates)

Annie Walker

Education
MSc, Structural Geology & Tectonics, University of Tennessee, Knoxville
BSc, Natural Systems Science, Le Moyne College

Experience

2017-present	Secretary, Houston Geological Society
2015-2017	Director, Houston Geological Society
2013-2017	Structural Geologist, ION Geophysical
2012-2013	Research Assistant, Structural Geology & Tectonics Research Group, University of Tennessee
2010-2012	Graduate Teaching Assistant, University of Tennessee
2009-2010	Executive Assistant (civilian) CG93, The Columbia Group & United States Coast Guard
2006-2008	Research & Field Assistant, Le Moyne College

Professional Affiliations
Houston Geological Society
American Association of Petroleum Geologists, PSGD
Geological Society of America
The Geological Society, London
Sigma Xi, The Scientific Research Honor Society

Statement
Serving the HGS as a Director and currently as Secretary has been a fantastic experience. I've truly enjoyed learning the ropes from our Committee members, my fellow Board members, and all of you along the way. As a group the HGS has weathered a challenging few years, but we've also pulled together to preserve and sustain the educational, professional, and outreach activities that are the core of the HGS community. During my time on the Board I've had the benefit of observing four dynamic Treasurers and Treasurers-Elect navigate the HGS through a grueling downturn and all the financial concerns it brought with it. Our next goal is to set the HGS on a path to stronger, long-term financial independence to help stabilize the Society against future downturns and the changing landscape and moods of our industry. I'm very grateful I've had this opportunity to get to know the HGS, and I'd be honored to serve you again as the 2018 Treasurer-Elect. ■

Ryan Yarrington

Ryan Yarrington is currently an Enterprise Account Executive at Oildex. Prior to working at Oildex Ryan has worked in 2D and 3D Onshore and Offshore Seismic Acquisition, Microseismic , Data Processing and HSE. He is currently the Treasurer of HGS and has spent the last 3 years volunteering for the HGS International Committee. Ryan looks forward to working with the HGS and serving in many different roles in the future. ■

Candidates for the 2018–2019 Executive Board *(continued)*

Director – Two-year term *Vote for two candidates*

Mike Allison

Education
MS Geology, University of Tennessee, Knoxville, TN
BS Geology, University of Miami, Coral Gables, FL

Experience

2017 - Present	Owner/Consultant, Raptor Aerial Services
2014 - 2016	IT & Business Systems Manager, Fieldwood Energy
2005 - 2013	IT Manager, Devon Energy
2000 - 2004	R&D Product Geoscientist, Landmark Graphics Corporation
1985 - 2000	Chevron, Various IT Leadership and Geoscience Technical Positions
1983 - 1985	Gulf Oil Corporation, Development Geologist

Professional Affiliations:
HGS (2004), AAPG (1982), SPE (2005)

Statement
I am honored to be invited to run for the position of Director for the HGS. I have 35 years of experience in the oil and gas industry and been involved with the HGS for over 14 years in various volunteer capacities. My recent Leadership positions with the HGS include Treasurer (2017-2018) and Treasurer-Elect (2016-2017). I have also been the Treasurer for the HGS Northsiders and a long-time volunteer with the HGS Continuing Education Committee and HGS Video Committee. ■

Brent Boyd

Brent Boyd has a long career (33 yrs) in petroleum exploration as data subsurface interpreter and manager. He enjoys making maps, discussing ideas about finding oil and has had the privilege to work with many great teams in the hunt for new reserves in throughout career.

Brent graduated in 1985 with a BS in Geophysics from Texas A&M University. He began his career with Arco Oil and Gas working in the Midland office. He worked the Permian Basin acquiring and interpreting seismic until 1993 prior to being reassigned to Vastar Resources in Houston. From 1993 to 2000 Brent worked the Arkoma Basin prior to joining Anadarko Petroleum working in international exploration. He has worked primarily the Australian and African basins. In 2012, he started a five-year rotational assignment in Algeria as the G&G Manager of the Anadarko assets in that country. He recently returned to Houston as G&G Manager of the International New Ventures group.

Brent will bring to the role of Director at HGS the same thing he brings to all his team assignments – dedication, reliability, and servant leadership. He will work to see that HGS remains the best place in Houston for exchanging ideas and business cards with other people in the petroleum exploration industry. ■

Candidates for the 2018–2019 Executive Board *(continued)*

Director – Two-year term *Vote for two candidates*

Bryan Guzman

Education
2008, BS Geology University of Texas at San Antonio
2018, MS Analytics Texas A&M University

Experience

2007 - 2008	Geo-Tech Balcones Energy Library
2008 - 2011	Geologist - Ingrain Inc.
2011 - 2013	Geoscientist - Ingrain Inc.
2014 - 2015	Product Champion - Drill Cutting Technologies - Ingrain Inc.
2015 - 2017	Geologic Advisor - Ingrain Inc.
2018 - Present	Technical Advisor - Ingrain a Halliburton Service

Professional Affiliations
HGS, AAPG, SPE, SPWLA

Professional Activities

2011 - 2017	HGS Chairman Exhibits Committee
2013 - 2014	HGS Secretary
2015 - 2016	HGS Treasurer Elect
2016 - 2017	HGS Treasurer
2017 - Present	HGS Advertising Committee Chairman

Statement
Since joining the HGS I have enjoyed the benefits of education, networking, and friendship. Currently I have been working on ways to grow the advertising for the bulletin, website and HGS organized conferences. I have spent much of my time working on the exhibits committee organizing the set-up and transportation of the HGS booth for various conventions throughout the year. When I served as HGS Secretary it afforded me the opportunity to learn more about the many functions of the HGS. I was also exposed to the duties as the HGS Treasurer-elect and Treasurer where I witnessed the society's dedication to the various efforts through the annual budget. It has been a pleasure meeting many people along the way and I am thankful to the opportunities the HGS has provided me while serving as a chairman, secretary and treasurer. It would be my great pleasure to serve in the capacity of HGS Director. ■

Rachel Todkill

Education
BS, Geology, Texas A&M University, 2012
MS, Geology, University of Texas at San Antonio, 2015

Experience

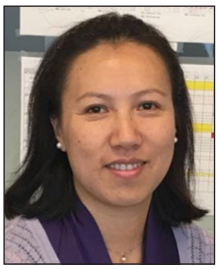
2016-2017	Secretary, Houston Geological Society
2017-Present	Drillinginfo, Strategic Account Director
2016-2017	Drillinginfo, Technical Account Manager
2015-2016	Drillinginfo, Account Development Manager
2013-2015	University of Texas at San Antonio, Teaching Assistant: Historical Geology and Paleontology Laboratories

Professional Affiliations
Houston Geological Society
American Association of Petroleum Geologists
Young Professionals in Energy
Women's Energy Network
Society of Petroleum Engineers

Statement
I have been a member of HGS since I moved back to Houston after completing my graduate degree in geology. I found the HGS to be a wonderful organization and industry network. I had the honor of serving as HGS Secretary for the 2016-2017 term, which was a fantastic experience. During that time I learned that the success of the HGS organization is dependent on its members and their contribution. Without a large group of volunteers and trail blazers HGS would not be the educational and professional association it is today. I was humbled to see people that give time away from their jobs and families to make HGS run smoothly. I would be honored to serve as a Director for the 2018-2019 D term. If elected, I will work increase member awareness of the educational and networking opportunities provided to the industry through HGS. ■

Candidates for the 2018–2019 Executive Board *(continued)*

Editor-elect (one candidate)



Fang Lin

Education
BS, Geology, Chengdu University of Technology
MS, Ore Deposit Geology, Chengdu University of Technology
PhD, Geosciences, Virginia Tech University

Experience

2005 - present	Chevron Energy Technology Company, Petroleum Geochemist
2000 - 2005	Virginia Tech University, Graduate Assistant
1998 - 2000	Chengdu University of Technology, Instructor

Professional Awards and Activities

2011 - 2012	Houston Geological Society Editor's Award
2010 - present	Reviewer for AAPG *Bulletin*
2009 - 2014	Index Editor for HGS *Bulletin*

Statement
My involvement in Houston Geological Society began when I registered for a professional training course offered by HGS years ago. I became a regular member of the Society and served as the index editor for HGS *Bulletin* from 2009 - 2014. Working as the index editor was a great learning experience and opened my eyes about the breadth and depth at which HGS operates and engages our local geological community and the communities far and beyond. As the HGS *Bulletin* evolves into the digital era facing new challenges and opportunities, I am honored to be nominated to run for the HGS Editor-elect, and I am grateful for having the opportunity to continue to serve our great community. ■

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Jon Blickwede—*Candidate for President-elect*

Asociación Mexicana de Geólogos Petroleros
Sociedad Geológica Mexicana
Sociedad Venezolana de Ingenieros Geofísicos (Secretary, 1994 Congress)

Honors and Awards
Houston Geological Society, Best Paper Award 2004-2005
GCAGS Convention 2004, 3rd Place Best Oral Presentation
New Orleans Geological Society, Best Paper Award 1988-1989
Invited Speaker, 1988 William Smith Meeting, The Geological Society, London
Invited Speaker, Best of AAPG for SEG, 1988
AAPG George C. Matson Award for best technical paper presented at 1988 AAPG Annual Meeting (Perdido Foldbelt: A New Deepwater Frontier in Gulf of Mexico)
AAPG Student Paper Award, 1981

Statement
I am honored to be a nominee for President-elect of the Houston Geological Society and I look forward to the opportunity to serve our professional community in the preeminent location for petroleum geoscience & technology.

My primary duties as President-elect will be to assist 2018-19 HGS President Cheryl Desforges, become familiar with the key issues and future challenges facing HGS and start to formulate the best ideas for addressing them. These challenges will include 1) continuing to improve the ways in which HGS can support and encourage the new generation of geoscientists (including transmission of knowledge from the elders in the community, so many of whom are now heading into retirement), 2) provide relevant and timely continuing geoscience education opportunities, 3) offer a broad spectrum of networking opportunities that appeal to a broad cross-section of the membership.

In addition, a major responsibility of the 2018-19 President-elect will be to help ensure optimal HGS support for the GCAGS Annual Convention scheduled for 2019 in Houston. As such, I look forward to working with GCAGS 2019 General Chairman Mike Erpenbeck to prepare for another great meeting.

I hope to get your vote! ■

Candidates for the 2018–2019 Executive Board *(continued)*

ontinued from page 32

Justin Vandenbrink—*Candidate for President-elect*

2016	HGS Golf Tournament, Director
2012	HGS/PESGB Africa Conference Committee Member

Professional Affiliations
Houston Geological Society, HGS
American Associated of Petroleum Geologists, AAPG
Association of Professional Engineers and Geoscientists of Alberta, APEGA
Canadian Society of Petroleum Geologists, CSPG
Society of Exploration Geophysicists, SEG
Society for Sedimentary Geology, SEPM

Professional Honors and Awards

2016	Presidents Award, HGS
2012	Chairman's Award, HGS
2009	Rising Star Award, HGS
2005	Professional Geologist, APEGA

Statement
I am honored to be nominated as a candidate for the office of President of the Houston Geological Society.

For the past decade I have volunteered with the HGS in various roles. During this time I have learned about how the Society works, what is needed for it to be successful and its importance to the members.

Hopefully the Oil and Gas industry is hopefully turning around and the next few years will be a critical time for the HGS to focus on its future and how it will grow. I want to bring a fresh perspective that includes more engagement with our younger professional members and more exposure in the city of Houston itself.

My career has developed because of my ability to network. If elected President, I would use my skills to help the HGS grow and expand its network as well. ■

continued from page 33

Geoffrey Haddad—*Candidate for Vice President*

skills, 2) developing a broad perspective (cross geology disciplines; multiple world basins; cross functional), and 3) building a solid network of trusted colleagues and friends who share a common passion for the geosciences. I believe HGS is uniquely positioned to help geoscientists in the Houston area develop these strengths by continuing to advance and improve on the society's objectives of "stimulating interest and promoting advancement in geology for the Houston area; disseminating and facilitating discussion of geological information; and encouraging academic training in the science of geology".

As Vice President of HGS I will leverage my strengths to help the society continue to attract excellent speakers to technical meetings. I would like to see a mix of topics covering conventional and unconventional reservoirs presented by geoscientists from industry and academia. I would also like to work on finding ways to attract more Neogeos into the organization. I am certain that HGS membership would benefit from bringing in greater numbers of these young, dynamic and innovative geoscientists. The future of the HGS depends on them. We are working in changing times with tremendous innovations that are altering the landscape of the energy industry. To help meet the challenges that lie ahead I will contribute my time, energy, and leadership to the roll of HGS Vice President and sincerely seek your vote. ■

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Penny E. Patterson—*Candidate for Vice President*

asked to give a presentation at a fall Luncheon Meeting and to my surprise I received the 2011 HGS Best Speaker Award of the Year. Through this invaluable experience I discovered the depth and diversity of our geoscience community, the critical interests and needs of our community, and the keen interest of our community in the growth and advancement of the field of geoscience.

I am honored to be nominated for the position of Vice President of the Houston Geological Society. One key role for the HGS Vice President is to work closely with the HGS Board, HGS members and our community at large to develop technical talks at the HGS Luncheon and General Dinner Meetings. With my previous experience as a speaker plus my years of knowing many people within our industry, I believe I can find speakers that will be of interest to the HGS membership. If elected, I will work closely with our geoscience community throughout the south Texas region to provide exemplary and timely technical talks relevant to the needs of our changing times. With oil prices reaching new highs from previous years, our geoscience community is uniquely poised for working together to develop innovative technology that will lead our energy industry into new directions. HGS should be an integral linkage to guide us into future geoscience opportunities and adventures. ■

HGS Scholarship Night

By Jackie Jordan

On February 12th HGS held its annual Scholarship Night Dinner. The event honors the student scholarship winners from the HGS's two scholarship Funds: the Calvert Memorial Scholarship and the HGS Foundation Fund Scholarship. There were seven recipients of the Calvert Memorial Scholarship; Megan Brown from the University of Colorado, John Cornthwaite from Rice University, Ryan Kissinger from Texas A&M, Shawn Lopez from the Colorado School of Mines, and Mariah Michie, Walter Paden Reed and Matthew Sexton from the University of Houston. The HGS Foundation Fund Scholarship was given to five undergraduate students; Keely Armstrong from Stephen F. Austin State University, Christina Coleman from Sam Houston State University, Haley May from Lamar University and Shannon Wang from Rice University. The Maby Scholarship on behalf of the Maby family was given to Danny Anderson, of the University of Texas.

Charles Sternbach, current President of the AAPG and Past-President of the HGS, was the featured speaker. His presentation was Lessons in Exploration Creativity from a Decade of Discovery Thinking Forums and AAPG's Global Super Basin Leadership Initiatives. Dr. Sternbach covered several topics highlighting the creation of the AAPG/DPA Discovery Thinking Forums in 2007. These are now an integral part of both the AAPG ACE and AAPG ICE Technical Programs. Charles also developed the AAPG Playmaker Forums in 2012 in addition to the upcoming AAPG Super Basin Leadership Conference in March 28-29, 2018 in Houston.

The HGS also announced the candidates for the 2018-2019 HGS Executive Board. The nominees for this year are; **Jon Blickwede** and **Justin Vandenbrink** for President-Elect, **Geoffrey Haddad** and **Penny Patterson** for Vice-President, **Ryan Yarrington** and **Annie Walker** for Treasurer-Elect, **Fang Yu** Editor-Elect, **Tami Shannon** and **April Parsons** for Secretary, and **Mike Allison**, **Brent Boyd**, **Bryan Guzman**, and **Rachel Todkill** for the two Board Director positions.

Through the generosity of our corporate and individual sponsors over $42,000.00 was raised for the Calvert Memorial and HGS Foundation Fund Scholarships. The money raised on this special night allows the HGS to continue its goals of stimulating the interest in and encouraging the advancement of geology in the Houston area as well as to inspire students of the geosciences to continue the magnificent work that was started by the pioneers of geology that have preceded them.

Cheryl Desforges with two of the Calvert Fund recipients

John Tubb, Jr. and Hal Miller

Melissa Faber and Ryan Kenyon

Calvert Memorial Scholarship Recipients

Megan Brown
University of Colorado

John Cornthwaite
Rice University

Ryan Kissinger
Texas A&M

Shawn Lopez
Colorado School of Mines

Mariah Michie
Walter Paden Reed
Matthew Sexton
University of Houston

HGS Foundation Fund Scholarship Recipients

Keely Armstrong
Stephen F. Austin State University

Christina Coleman
Sam Houston State University

Haley May
Lamar University

Shannon Wang
Rice University

Maby Scholarship on behalf of the Maby family
Danny Anderson
The University of Texas

Thank You Again to Our Generous Sponsors!

Platinum

Chevron

Silver

Murphy Exploration & Production Company

EOG Resources

HESS

Apache

Marathon Oil Corporation

Shell

Bronze

Core Laboratories

Thunder Exploration, Inc.

TGS

Noble Energy

OXY

Walter Oil & Gas Corporation

Cabot Oil & Gas

Subsurface Consultants & Associates

Vitruvian Exploration

Southwestern Energy

Roxanna

ConocoPhilips

Individual

Houston Energy

John and Sherry Adamick

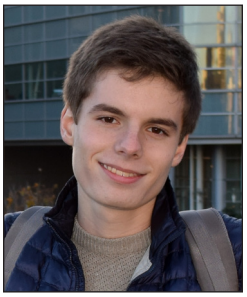
Richard and Eddie Bishop

HGS Undergraduate Scholarship Foundation Presents Five Scholarships

The HGS Undergraduate Scholarship Foundation has provided over $291,000 in scholarships to deserving geoscience students since 1984. This year the Foundation awarded scholarships totaling $19,000 to students from six universities participating in our program. Danny Anderson from The University of Texas was awarded the Maby Scholarship, presented each year to the Foundation's top applicant. Foundation Chairman John Adamick presented the scholarships to recipients at the February 13th HGS Scholarship Night dinner meeting. The Foundation was also fortunate to have a large number of sponsors support HGS scholarship programs. Over $42,000 in scholarship funding was raised from 21 different sponsors.

Vitae for our scholarship winners are listed below. These students are to be commended for their accomplishments.

Shannon Wang , Keely Armstrong , Danny Anderson, Haley May, Christina Coleman



Danny Anderson
Maby Scholarship Recipient
The University of Texas

Danny Anderson is a senior at the University of Texas at Austin studying high temperature geochemistry and paleontology. He has served as a voting power in the Senate of College Councils and as President of the Undergraduate Geological Society, and he remains an active member of the Geoscience Leadership Organization for Women. He has worked on numerous research projects, including an honors thesis under Dr. John Lassiter studying the spatial and temporal evolution of Mauna Kea's plumbing system. He is also working under Dr. Chris Bell assessing the dependability of skull morphologies historically cited as indicative of sand lizard genera. In 2016, Danny participated in a Research Experience for Undergraduates at Rutgers University, Newark studying near-surface geophysics. When he is not working, Danny likes to play guitar and hike around Austin. He will begin pursuing a PhD in the fall.

Keely Armstrong
Stephen F. Austin State University

Keely Armstrong is a senior at Stephen F. Austin State University pursuing a degree in Geology. She has consistently made the President's Honor Roll or Dean's List during her time at SFA. Keely is very enthusiastic about both Geology and her minor, Math. Keely leads Supplemental Instruction for math classes, a student-instructed study group provided by the Academic Assistance and Resource Center. She is working on an undergraduate independent study using math to predict what formations will be present at the surface based on topographic models rendered from LiDAR data. She is in her final semester at SFA and is currently looking for job opportunities she can pursue upon graduation in May.

Christina Coleman
Sam Houston State University

Christina Coleman is a senior at Sam Houston State University pursuing a degree in Geology with a minor in Entrepreneurship and has been the Dean's list every semester. She was Treasurer and Vice-President for the Sam Houston Association of Geology Students 2016-17 and received the S. H. A. G. S. Certificate of Academic Excellence Award for the 2016-2017 year. She has worked on many research projects to expand her knowledge of geology that involve soil and water analyses and data interpretation. Christina is currently is working on clay mineral identification using an X-Ray Diffractometer. She has chosen to minor in Entrepreneurship to give herself a background in business and a competitive advantage and would like start a business of her own. Christina's love of learning new things, problem solving and great work ethics will make her excel in her career. Following her graduation, Christina will pursue a career in the oil and gas industry.

Haley May
Lamar University

Haley May is currently a senior at Lamar University in Beaumont, TX currently finishing her Bachelor's degrees in Geology and Mathematics. She intends to use her background in both Geology and Mathematics to further her studies by pursuing a Master's in Geophysics and ultimately employment in oil and gas as an exploration geophysicist.

Haley is active member of the student societies, Lamar University Geological Society (where she served as President from 2017-2018) and Pi Mu Epsilon Mathematics Honor Society. She is conducting research with her professor at Lamar, presenting a poster of their results at the Fall 2017 AGU Conference in New Orleans, LA.

Haley has endured quite a trial before the start of the 2017 Fall semester. On August 31, 2017, the home that Haley and her children lived in flooded during Hurricane Harvey. This was a very difficult time for her family; yet, during it all, Haley continued to go to school and work on research. This alone testifies to the dedication and work ethic that Haley has in achieving her goals, not only for school and career goals, but also in being a caring mother to her 3 children.

Shannon Wang
Rice University

Shannon Wang is a senior at Rice University and holds the position of social in the Rice Undergraduate Geosciences Society. She will complete her BSc in Earth Science in May. In the summer of 2017 she participated in the Research Experience for Undergraduates program at Rutgers University completing a project on the environmental application of the spectral induced polarization method. She has published an abstract and presented a poster on this research at the Fall 2017 American Geophysical Union Meeting. Shannon enjoys studying new languages and dancing and is currently learning French and Cantonese as well as dancing for Rice Dance Theatre where she is a student choreographer.

John Adamick
HGS Foundation Chairman

Government Update

by ***Henry M. Wise, P.G. and Arlin Howles, P.G.***

If you'd like the most up-to-date Texas rules, regulations, and governmental meeting information we direct you to the HGS website to review The Wise Report. *This report, which comes out as needed but not more often than once a week, offers the most up-to-date information that may be of interest to Texas geologists.*

Pennsylvania, Delaware, and New York Approve Resolution to Ban Fracking in Delaware River Basin (*Environmental Standards*, December 2017)

In a September 13, 2017 news release by the Pennsylvania Department of Environmental Protection, it was reported that the Governors of Pennsylvania, Delaware, and New York announced that they had voted in favor of a resolution put forward by the Delaware River Basin Commission (DRBC) to issue draft regulations to permanently ban hydraulic fracturing for oil and gas in the Delaware River Basin. The resolution is designed to promulgate regulations that would prohibit any water project in the Delaware River Basin proposed for developing oil and gas resources by high-volume hydraulic fracturing. The Governors of Pennsylvania, Delaware, and New York comprise a majority of the DRBC. The other two members of the DRBC are the Governor of New Jersey and the Division Engineer, North Atlantic Division, U.S. Army Corps of Engineers. The Army Corps of Engineers voted against the measure, and New Jersey abstained from the vote.

The Delaware River Basin drains from portions of New York, New Jersey, Pennsylvania, and Delaware and supplies drinking water to more than 15 million people. Governors of the four states and the federal representative serve as the Delaware River Basin Commissioners and are tasked with overseeing a unified approach to managing the river system regardless of political boundaries. The DRBC has oversight in the basin for water-quality protection, permitting, water-conservation initiatives, water-supply allocation, watershed planning, drought management, flood-loss reduction, and recreation.

The DRBC resolution comes after congressional passage of the Delaware River Basin Conservation Act in December 2016, which requires federal, state, and local partners to work together and preserve the basin and its water resources. Congress passed the Act as part of a larger national legislative package known as the Water Infrastructure Improvements for the Nation Act.

Hydraulic fracturing related to oil and gas development in the Delaware River Basin has been a contentious issue since 2010, when DRBC's five Commissioners voted unanimously to "postpone consideration of well pad dockets until regulations are adopted." This postponement essentially put a moratorium on drilling for natural gas in several Pennsylvania counties and parts of southern New York.

In more recent news, some Pennsylvania lawmakers introduced a bill (House Resolution 515) urging the DRBC to abandon any plans to regulate drilling beyond already established requirements and to suspend a consideration of a moratorium on natural gas drilling in the Delaware River Basin. Pennsylvania Representative Jonathan Fritz stated that passing the DRBC resolution would be detrimental to all Pennsylvanians by impacting jobs and depriving land owners of economic opportunities in the northeastern part of the state.

The Virginia Uranium Mining Industry—To Be or Not to Be? (*Environmental Standards*, December 2017)

On private acreage in Virginia, millions of pounds of uranium ore lie buried—the nation's largest known uranium deposit. In the early 1980s, after the "oil shocks" of the 1970s encouraged investments in other forms of energy, a company called Marline Corporation searched for uranium in the Piedmont physiographic province of Virginia. The company reportedly discovered the "Swanson ore deposit" in Pittsylvania County, as well as other deposits that were less valuable. Marline Corp. began searching for uranium deposits in the East in the late 1970s, and in 1982 said it discovered 30 million pounds of uranium oxide in Pittsylvania County, potentially worth $1 billion or more. The company obtained leases on what it believed were 40,000 uranium-rich acres in the county and 16,000 acres in Fauquier, Madison, Culpeper, and Orange counties. The deposit at the Coles Hill site in Pittsylvania County has been described as, "the largest unmined uranium deposit in the nation, worth an estimated $10 billion."

In 2011, Virginia Uranium, Inc. (Virginia Uranium), current holder of the Coles Hill Uranium lease, estimated the deposit to be worth $7 billion. A separate 2011 report calculated that the ore deposit included 119 million pounds of uranium, of which, 63 million pounds exceeded 0.06% uranium and was economical to process.

However, the Commonwealth has banned uranium mining in the state. Virginia Uranium, the resource developer, wants to overturn the state's three-decade old ban on uranium mining in order to develop the massive uranium deposit in the state. In 2015, Virginia Uranium sued Gov. Terry McAuliffe and other state officials seeking to force Virginia to process its mining application. The developer's studies show that the net economic benefit of construction and operations would yield almost

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$5 billion for Virginians over the life of the mine—around 35 years. Some argue that with modern technology, efficient regulation, and 21st-century best practices, uranium mining is safe for workers, the environment, and surrounding populations.

The U.S. Supreme Court has requested the Solicitor General's perspective on Virginia Uranium's request for the high court to review Virginia's ban on uranium mining and the company's argument that the ban conflicts with precedent. In a signal that the high court is taking a closer look at the case, the federal government will now have an opportunity to weigh in on a petition filed in April 2017 by Virginia Uranium that disagreed with a split lower court's decision to uphold dismissal of the company's suit seeking to overturn the ban on uranium mining.

The lower courts said in February that the Atomic Energy Act (AEA) does not give the U.S. Nuclear Regulatory Commission (NRC) licensing authority over uranium mining unless it is located on federal lands. Virginia's ban, therefore, is derived under the Surface Mining Control and Reclamation Act of 1977, which provides the state with primary regulatory authority, the appeal's court majority said. However, the company disagreed and filed its petition asserting that the Supreme Court has already held that states must have a non-safety rationale to regulate activities within the NRC's purview.

Virginia's ban has no "non-safety rationale" for the ban, and Virginia Uranium believes that this was reason for the court to overturn it. The Fourth Circuit said, however, that because conventional mining is not subject to NRC regulation, the non-safety standard isn't applicable and Virginia's ban should hold. Both sides agree that the AEA gives the NRC the exclusive authority to regulate the radiation safety of uranium mining-related activities such as uranium ore milling and tailings storage, the petition said.

Virginia has urged the Supreme Court to deny the petition, arguing that there is nothing in the AEA that preempts state regulation of uranium mining, regardless of what the state's alleged purpose for regulating the activity is.

"Conventional uranium mining on nonfederal lands is simply not within the preempted field," the Commonwealth's response brief said. "Virginia's uranium-mining moratorium likewise does not conflict with the Atomic Energy Act because the Act does not require states to permit the mining of uranium ore in the first place."

Will the largest uranium deposit in the country be developed? Stay tuned.

AGI Geoscience Policy Monthly Review (November 2017)

Senate Takes First Step to Open ANWR for Oil and Gas Leasing

On November 8, 2017 the Senate Committee on Energy and Natural Resources introduced reconciliation legislation, fulfilling instructions in the fiscal year (FY) 2018 budget resolution (H.Con.Res.71) for the committee to provide legislative recommendations to the Senate Committee on the Budget that would result in $1 billion in new revenue over ten years to offset federal tax cuts. The legislation would direct the Secretary of the Interior to implement an oil and gas leasing program for the coastal plain (1002 Area) of the Arctic National Wildlife Refuge (ANWR), which the Congressional Budget Office estimates would increase net offsetting receipts by about $1.1 billion over the 2018-2027 period.

Nebraska Approves Keystone XL Pipeline

Nebraska regulators from the Nebraska Public Service Commission approved the building of the Keystone XL pipeline on November 20, 2017. This pipeline would ship approximately 830,000 barrels of oil per day, according to the Commission, from Alberta, Canada through the state of Nebraska, before connecting to existing infrastructure delivering to refineries on the U.S. Gulf Coast. The approved route for the pipeline is different than the route that was initially proposed by the TransCanada Corporation, in that it is angled to cut more sharply across the northern part of the state, therefore avoiding the endangered whooping crane habitat and Sand Hills ecological area.

Trump Administration Releases Draft of Comprehensive Report on Latest Climate Science

The U.S. Global Change Research Program (USGCRP) released a draft of the highly-anticipated Fourth National Climate Assessment (NCA4) for public comment on November 3, 2017. The NCA is a quadrennial scientific assessment, which analyzes the impacts of both human-induced and natural global climate change, mandated by Congress in the Global Change Research Act (GCRA) of 1990.

The fourth NCA is being developed in two volumes, and is expected to be completed in December 2018. Volume I, the Climate Science Special Report (CSSR), assesses the physical science of climate change, with a focus on the United States. The CSSR summarizes the best-available science on observed and projected climate changes, and intends to serve as the foundation for efforts to assess climate-related risks and inform decision-making. Of note, the report finds that the global average sea level has risen by about 7-8 inches in the last 115 years, with over half of that rise occurring since 1993, and the annual average surface

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HGS Welcomes New Members

New Members Effective February 2018

ACTIVE MEMBERS	EMERITUS MEMBER	STUDENT MEMBERS
Catherine Donohue	Mike Deming	Matthew Law
James Foradas		Rafo Linan
Kevin Hartl		Amanda Pascali
Scott Manwaring		Leila Wahab
Rick McGee		
Francis (Phil) Richard		

Welcome New Members

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temperature over the contiguous United States has increased by about 1.8 degrees Fahrenheit over the same period. Volume II of the NCA4 is an assessment of the impacts, risks, and adaptation across the United States.

A revised draft of the report will undergo final agency clearance following further review by hundreds of independent scientists spanning various disciplines and fields of expertise, including experts from the National Academy of Sciences, and consideration of any public comments received.

House Natural Resources Subcommittee Hearing on Geothermal Energy, Geologic Mapping, and Hazards

The House Natural Resources Subcommittee on Energy and Mineral Resources held a hearing on November 30, 2017 to discuss a draft bill to promote timely geothermal energy exploration under federal leases, and three other bills related to geologic mapping and hazards research, monitoring, and response.

H.R.1675, the National Landslide Preparedness Act, would create a national program to identify and understand risks and reduce losses from landslide hazards, and help improve communication and emergency preparedness. The bill would also establish a national 3D Elevation Program (3DEP) to update and produce standard, publicly accessible 3D elevation data for the entire United States. H.R.4403, the National Geologic Mapping Act Reauthorization Act, would reauthorize the National Cooperative Geologic Mapping Program (NCGMP) through fiscal year (FY) 2023. The program works with federal, state, and university partners to produce geologic maps that address key national, regional, and local needs. Finally, the discussion draft of the National Volcano Early Warning and Monitoring System Act would establish a comprehensive national system to organize, modernize, standardize, and stabilize the monitoring systems of U.S. volcano observatories.

These three hazards programs, all led by the U.S. Geological Survey (USGS) in coordination with other federal agencies such as the National Science Foundation (NSF) and National Oceanic and Atmospheric Administration (NOAA), are essential for protecting American life and property, ensuring robust infrastructure, and advancing our energy security. In her testimony, Allyson Anderson Book, Executive Director of the American Geosciences Institute (AGI), expressed support for the reauthorization of NCGMP, which provides essential information to the public and private sectors, as well as the bills to establish a national landslide hazards program and a national volcano early warning and monitoring system.

Among the other witnesses on the panel, Dr. David Applegate, Associate Director for Natural Hazards of the USGS, and Steve Masterman, President of the Association of American State Geologists (AASG) and State Geologist of Alaska, both echoed Ms. Book's sentiment regarding the substantial need for geologic mapping, volcano monitoring, and landslide preparedness. Mr. Masterman specified that while the NCGMP has been very productive in its mapping efforts thus far, only 17 percent of the nation is mapped at the detailed scale needed to inform important decisions for land use planning and resource management. Extending geologic mapping across the nation would generate the information required to characterize domestic mineral resources, ensure mineral independence, and thereby aid national security.

NASA and NOAA Successfully Launch Next-Generation Polar Orbiting Satellite

On November 18, 2017 the National Aeronautics and Space Administration (NASA) launched a new satellite for the National Oceanic and Atmospheric Administration (NOAA), which has significantly better imaging capabilities than any of its predecessors.

The satellite, previously referred to as the Joint Polar Satellite System-1 (JPSS-1) and now officially known as NOAA-20 after reaching its orbit, lifted off from Vandenberg Air Force Base, California, at 1:47 a.m. PST. NOAA-20 joins the Geostationary Operational Environmental Satellite-16 (GOES-16), launched just over a year ago, to provide forecasters unprecedented access to high-quality data.

NOAA-20 is the first in a series of four polar orbiting satellites, referred to as the JPSS series, equipped with next-generation technology to help improve the timeliness and accuracy of U.S. weather forecasts three to seven days out. The satellite will provide detailed images of the Earth's surface and observations of atmospheric temperature and moisture, clouds, sea-surface temperature, ocean color, sea ice cover, volcanic ash, and fire detection. In addition to improving weather forecasting, the data will assist emergency managers in responding to natural disasters and help communities recovering from severe storms by providing better views of storm damage and showing the extent of power outages. Scientists and forecasters will be able to use the satellite's data after its five advanced instruments complete three months of tests.

JPSS satellites are designed to operate for seven years, with the potential for several more years. The three other polar orbiting satellites developed in the JPSS series are scheduled to launch in 2021, 2026, and 2031. ■

Big Continent - Big Ideas - Big Opportunity
Strategies for Success
The 17th HGS-PESGB Conference on African E&P

September 11-12, 2018 • Houston Texas

Guidelines For Abstract Submission

Submit your abstract for consideration as either an oral presentation or poster, by sending it, as an email attachment, to Africa2018@hgs.org. Submissions should be sent as soon as possible and no later than March 15, 2018.

Assessment of the abstracts will be based upon the quality of the abstracts and the relevance to the suggested topics as listed below:

- African E & P in the evolving business environment - above ground risks & rewards
- New and emerging exploration trends
- Gas and oil in N. and E Africa
- Developing and integrating geological concepts: Impact on exploration in Africa
- Big data, AI and innovative technologies applied to African E & P
- What we thought we knew – Exploration concepts to production reality

Abstracts should be:

- Length should be a maximum of two 8.5 x 11-inch pages, and may include diagrams in color or black and white, and references. Please use Arial font, size 10, left justification alignment, and single spacing.
- Submit as either MS Word 2016/ 2013/2010 documents with graphics embedded in to the document.
- Each file submitted should include the principal author's surname in the file name.
- Include contact information (email address) for the principal author in the abstract.
- Indicate the speaker with an asterisk (*) after the name in the author list.

The principal author of submitted abstracts will be notified of the committee's decision no later than April 30, 2018.

Accepted Submissions:
Each author is requested to submit a Short Abstract (up to 2 pages) with an opportunity to also submit an Extended Abstract for their oral or poster presentation.

Short Abstracts (due by July 31)
Short abstracts (up to 2 pages) will be reproduced on 8.5 x 11-inch paper and handed out at the meeting in the proceedings volume.

- A formatting template will be provided to authors of all accepted submissions to assist in preparing of abstracts.
- Authors are solely responsible for the content of the material submitted and will be asked to release HGS, PESGB and the sponsors from any consequence of distribution of the material.
- Accepted abstracts may be posted and/or archived on the HGS web site.

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September 11-12, 2018 • Houston Texas

Guidelines For Abstract Submission Continued

Extended Abstract (due by July 31)
Authors of accepted oral and posters are also encouraged to submit an extended abstract that may include references, appendices, figures and maps and will be eligible for higher marks within the awards system. Extended abstracts will be compiled on a CD in Adobe Acrobat (PDF) format, reproduced and distributed along with the proceedings volume of short abstracts to participants at the conference. The CD will not be secured or protected by copyright.

- Length may be several pages in length and can include B&W or color graphics.
- Include contact information for the author(s) in the abstract (email and/or mailing address).
- Page size should be 8.5 x 11 inch. A formatting template will be provided to authors of all accepted submissions to assist in preparing extended abstracts.
- Graphics can be text figures, page-sized or oversize and may be in color.
- All or part of your PowerPoint presentation can be included.
- Oversize maps or figures from your poster could also be used.

Registration
The principal author (Speaker) of each accepted submission for oral presentations and posters will receive complimentary registration to the conference.

Awards
The HGS will be recognising the best technical contributions with its prestigious awards; made by a respected panel of industry judges. The presentation ceremony will take place at the conference close.

Awards will be made for
- Best Student Poster
- Best Poster
- Best Oral Paper

Importantly authors should note that 50% of the marks from the judges will be allocated for the abstract. Also, extended abstracts are encouraged and will be eligible for higher marks within the awards system.

HGS *Bulletin* Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

Text should be submitted by email as an attached text or Word file or on a clearly labeled CD in Word format with a hard copy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator or Adobe Photoshop. Files should be saved and submitted in .ai, .eps, .tif or .jpg format. Send them as separate attachments via email or CD if they are larger than 5 MEGs each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .tif, .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 5 MB) or on CD or DVD.

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The *Bulletin* is printed digitally using InDesign. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email ads@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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Placement	Rate	Specifications/Description
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	$300 – 3 Months	
	$600 – 6 Months	
	$1200 – 12 Months	
Vendor Corner	$250 *4 Pack option with 1 FREE bonus event for $1000.00 available. Send request to vendorcorner@hgs.org.	Company logo, company website, and company description will be highlighted on HGS Calendar website event. This is an opportunity to display company wares, gain personnel exposure and hand out product information at HGS dinner meetings.
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Bundle & Save!	• 30% off website ads when combined with print ads in all 10 HGS *Bulletin* issues. • 20% off website ads when combined with print ads in 5 HGS *Bulletin* issues. • 10% off website ads when combined with print ads in 3 *Bulletin* issues.	

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Qualifications for Active Membership

1) Have a degree in geology or an allied geoscience from an accredited college or university; or
2) Have a degree in science or engineering from an accredited college or university and have been engaged in the professional study or practice of earth science for at least five (5) years.

Qualifications for Associate Membership (including students)

1) Be involved in the application of the earth or allied sciences.
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HGS Presents:

Take a kid to the outcrop family campout!

April 27-29, 2018
Camp Cullen YMCA in Trinity, TX

Come join fellow HGS members and their families for a weekend of fun! Activities include:

Interpreted quarry with hunts for fossils and petrified wood
Newly renovated geology lab with samples and flume
Gold panning
Zip line
Archery
Riflery
Arts & crafts
Marathon pipeline slide
Basketball
Gaga ball
Campfires

All of this and more, all only 1.5 hours north of Houston!

Check in Friday evening and check out Sunday morning. Cost is $110/person for up to 4 people. For families of 5+, call for a discounted rate. The fee includes overnight stay Friday and Saturday nights, 4 meals and all activities. Each family will have a private bunkhouse for up to 8 and private family bathroom in newly renovated cabins. For more information on the facilities, please visit the Camp Cullen website at https://www.ymcacampcullen.org/

Reserve your spot today! Reservations accepted through April 19, 2018
Call the HGS office at 713-463-9476

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