HGS Bulletin
Houston Geological Society
Volume 57, Number 6
February 2015

Anthropogenic Climate Change – A Growing Awareness in the Oil and Gas Industry

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Years Not Decades: Proven Reserves and the Shale Revolution

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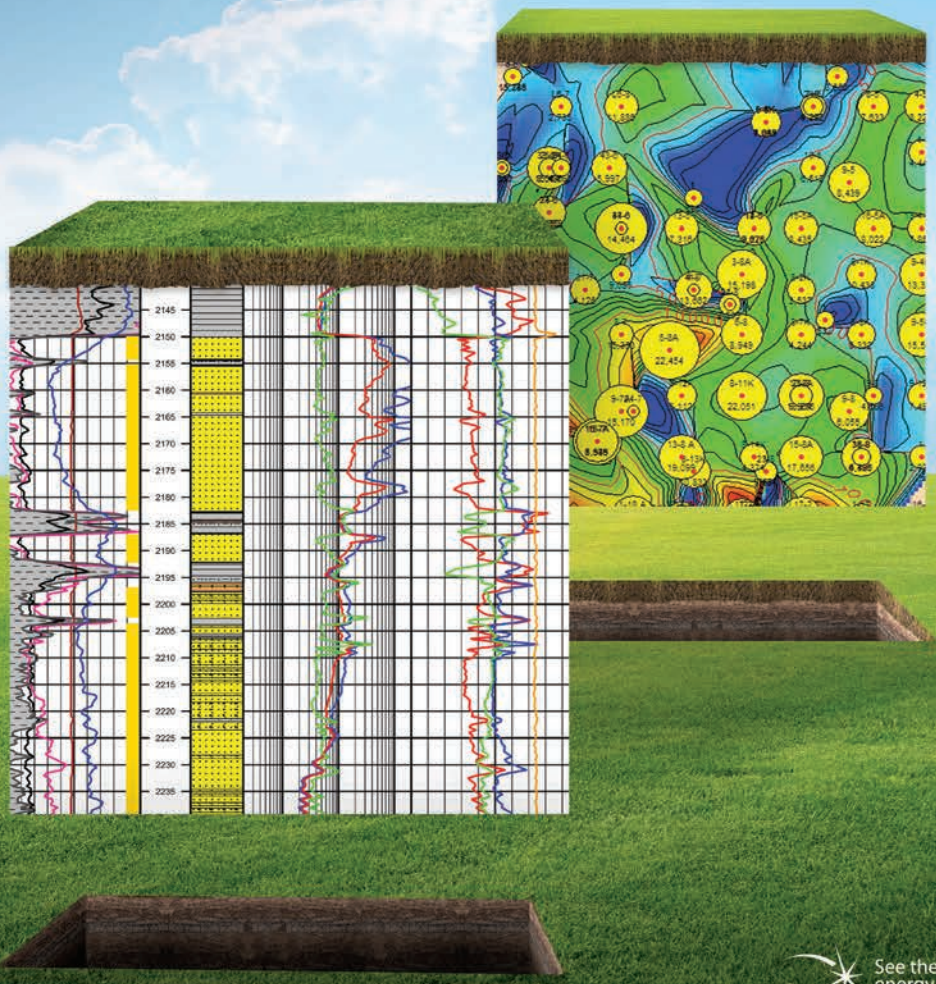

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Houston Geological Society

Volume 57, Number 6 February 2015

In Every Issue

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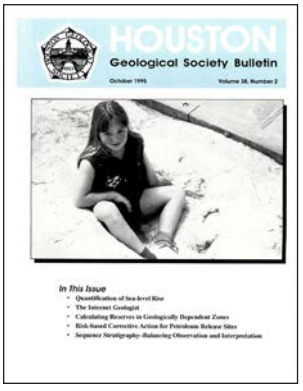
Technical Meetings

Other Features



About the Cover: Maggie Kukowski, daughter of HGS member Rob Kukowski, sits in a sauropod dinosaur rear footprint in 1995 and again in 2014. Both photos were taken at Dinosaur Valley State Park, Glen Rose, Texas.

Applied Geoscience Conference

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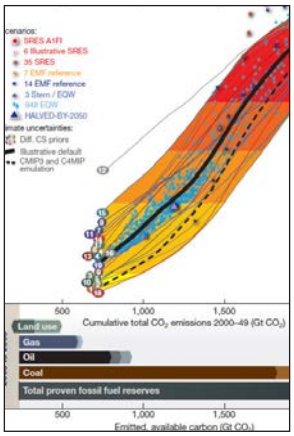

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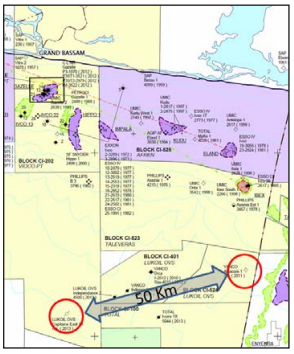

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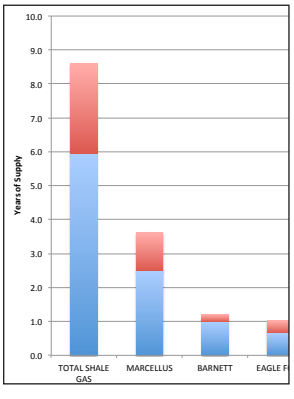

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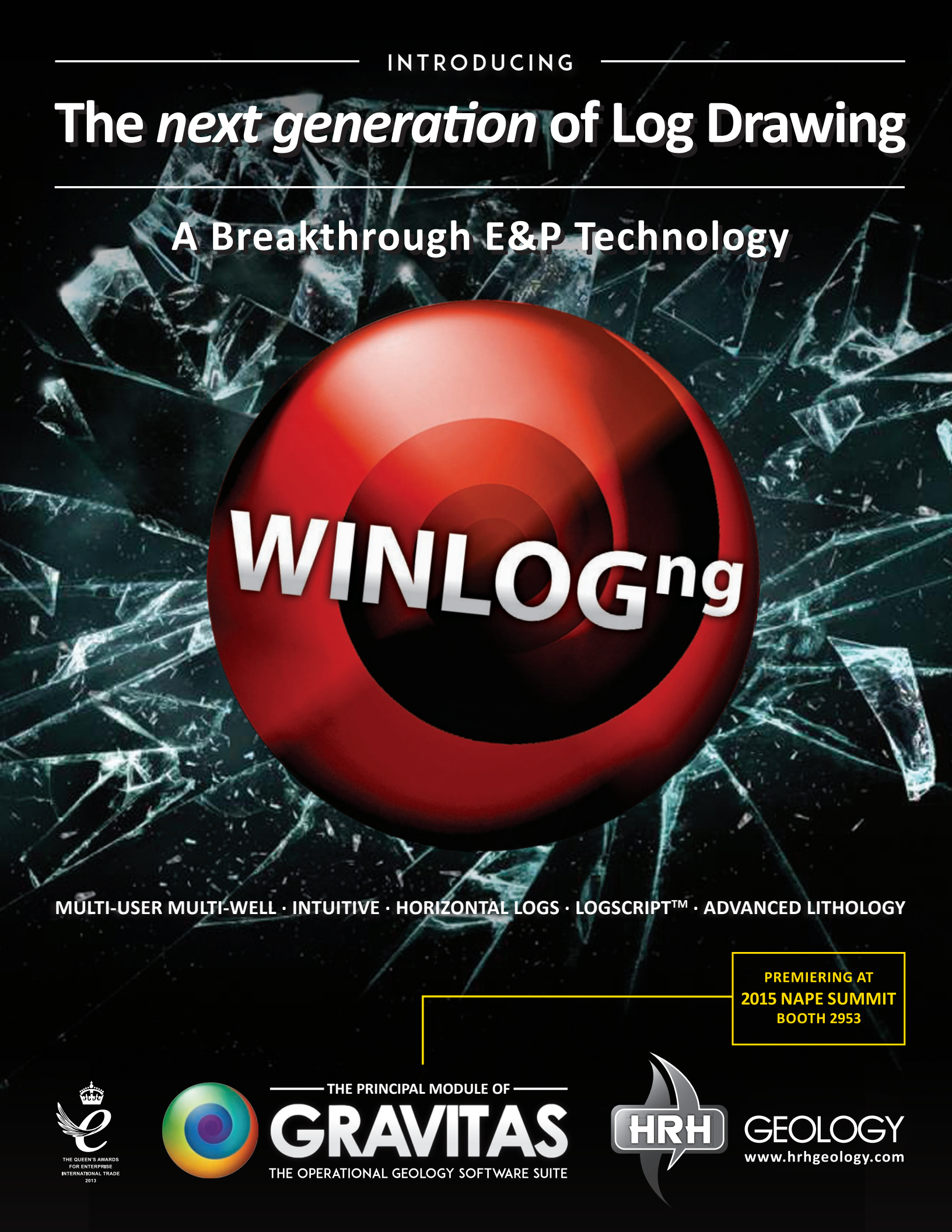
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Presidential Ponderings

Well, as Christmas has come and gone, it's time to ponder what you might want to read in February. It will be old news by then, but gasoline is under $2.40 per gallon on the west side of Houston. A search of the web shows that it is as low as $1.95 near Pearland. West Texas Intermediate is $58.15 as I ponder these things.

I know that some people read the *Look Back in Time* columns. **Steve Allen** informed me that it was he and not **Steve Adams** who partnered me to a HGS Tennis Tourney title way back when. Unfortunately for Steve, I don't think that the tennis plaque is up at the office. I will check. I think that Steve was on the winning team about six times, but my memory may be playing tricks on me.

On December 6 I attended the workshop of the Engineering and Science Council of Houston (ECH) at the Houston Museum of Natural Science. This is truly a wonderful undertaking. I did not know that many of these programs existed (http://www.hmns.org/index.php?option=com_content&view=article&id=197&Itemid=145) at the Museum. More importantly, the University of Houston has started a STEM (Science Technology Engineering and Math) center (http://www.uh.edu/stem/) and will take over the hosting of the Science and Engineering Fair of Houston (SEFH, https://sefhouston.org//). This can be an eye-opening event as you see what the young minds have defined as a problem and how they have gone about resolving it. The fair is being organized more along the lines of the Intel Education Science, Math and Technology Competitions (http://www.intel.com/content/www/us/en/education/competitions.html). The Texas State competition is run under similar guidelines so this will give the Houston area competitors (18 counties!!) more preparation for the State and international competitions. Last year's Houston representatives did quite well at State and I believe that every one of them that went to the international event placed at the International Competition in Los Angeles.

These competitions don't come without expenses and logistical needs. With the space available at U of H, the fair organizers hope to have 1200 to 1400 teams participate this year on February 28. The fair needs judges. It also needs Special Awarding Agencies. They are looking for 800 judges this year!

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Expenses associated with this fair increase with the number of competitors and of winners moving on to the State and International competitions. HGS assists this endeavor in three ways now:

1. HGS provides annual support to the SEFH. HGS is fortunate to be able to provide a small amount of money annually that goes towards the fair.
2. HGS provides three Interning Research Assistantships (formerly the HMNS Internships) that are presented at the HGS Guest Night. There is an opportunity to meet these outstanding students at the annual ECH SEFH banquet where HGS has three tables for its members to sit and share dinner with these awardees. There are usually extra seats at the tables so if you are interested in attending, contact **Claudia Ludwig** or **Sue Pritchett**.
3. The last way that HGS supports the SEFH is through a dedicated contribution to the SEFH Foundation. This foundation was established in 2014 in an effort to provide more regular present and future funding for the fair. Last year's HGS Board agreed to provide $50,000 to the foundation established at U of H. The money will be contributed over a five-year period.

From the President *continued on page 9*

Dave Miller
dwmiller.hgs@gmail.com

Learning a New Language

When I began my first job, I had no idea how complex the language of the industry I had chosen was. My first project involved analyzing several well logs and creating structure, isopach and net pay maps. Armed with two boxes of logs and a set of interpretation manuals, I began my journey into the oil-field world of special terms and abbreviations. Aside from becoming familiar with the abbreviations for various wireline log types and curves, which I will not mention specifically to avoid being accused of vendor bias, I learned the difference between sands that were porous and non-porous, or tight sands. I felt pretty good about my ability to discriminate between the two, so imagine my confusion when I found a large "Tight Hole" stamp on a well that clearly had a significant thickness of porous sand. So began a career of learning new terms, applying familiar terms to new things; and constantly wrestling with and trying to decipher the abbreviations that we, as an industry, seem to love.

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When I began my career, a new geologist was expected to get well-site experience as soon and as often as it was available. My first trip to the well-site allowed me to learn yet another set of terms and abbreviations, some real and some created simply to give the new person (the geologist, in particular) a hard time, hopefully in a good natured sense. You only ask once to be directed to the dog house, an odd place to find the drillers and company man in charge. After a futile search for the blue metal stretcher (needed because the red one was broken) and the key to the V-door, I began to be a bit less naïve. The new terms and abbreviations, such as ROP, MD, TVD, KB, RT (not the resistivity related RT), BOP, joint (which I understood in a completely different context), stand, MW, kelly, monkey board, slips, and the ever confusing "gas units" seemed to arrive in a flood.

As my career evolved, I constantly had to learn new terms. In most companies just learning the abbreviations for the various entities within the company posed a real challenge. Frequent re-organizations and mergers made this even more challenging. While working on development projects, TVT, TST, TVD became important. Net/gross, perhaps one of the more simple concepts but often used in a very poorly defined or poorly understood sense, mattered. "Walking logs" updip to create net pay maps was a useful concept. Net sand (usually based on a simple GR or SP cut-off), net reservoir (now the porosity cut-off is added) and net pay (finally water saturation, Sw, appears) form a funnel with the values successively decreasing or, sometimes, remaining the same. Seems simple, but I have personally seen analyses and presentations where the net pay was greater than the net sand.

When I was encouraged to attend training courses related to topics outside of my discipline, I became exposed to yet another set of abbreviations and terms: Bo, Bg, RF, VR, k , TOC, S1, S2, S3, Tmax, CAOF, and many others. In my opinion, the drillers are the best at creating abbreviations. My favorite abbreviation of all time came from a completion report on a well my company was participating in. The report followed a perforation job and it read "SISTASF". Wow! Turns out, this means "Surface Inspection Showed That All Shots Fired". Obvious, no? I have always been impressed by the ability of drillers to condense 24 hours of activity into a single line composed of the first letter of every activity that occurred, even abbreviating abbreviations!

Terms and abbreviations aren't the only things that can be confusing. After spending many years working domestically and for a single company, I had the opportunity to work in West Africa. It was there that I got tripped up by colors. Everyone

From the Editor *continued on page 11*

From the President continued from page 5

Probably the most surprising bits of information that came out of the workshop include:

- The need to reach out to children in the fourth grade
- The ninth grade may be too late
- The need to "sell" the parents as much as the children
- Perceptions about science

If you'd like to see our future scientists, sign up for the SEFH, you won't regret it!

I have asked the Young Professionals to make being a member of the HGS a part of their career development. Since bringing up that topic I have learned that Schlumberger is championing such participation. Maurice Nessim, President of Schlumberger's PTS organization is an SEG Director at large and is championing participation in the SEG. Uwem Upong, President of Schlumberger's SIS organization is championing participation in AAPG and professional geological societies. I hope that such activity will trickle down to HGS. Lastly, Patrick Schorn, Schlumberger's President of Operations and Integration, has an interview on the internal Schlumberger hub where he discusses the importance of his early participation in SPE. HGS is a great way to enhance your professional development. Consider serving on a committee or as an officer candidate. There is a local society in the Pacific section whose Board comprises 100% Young Professionals. Surely Houston could have three or four.

Our Legends Night will have taken place by the time this is published. I hope that you had the opportunity to attend. ■

Until next month, when I have to ponder something new…

From the Editor continued from page 7

knew that oil was green, gas was red and water was blue when colored on a map or on a log. The first set of maps that I looked at when arriving at my new posting seemed to be completely wrong. Our partner had clearly made a huge mistake, as the oil (green on their maps) was structurally higher than the gas (red on their maps). Thinking I had found something terribly important, I went to see my boss who was kind enough to point out that this particular company, in this particular country, used a different color convention.

Most importantly, I have learned to ask when I find a term or abbreviation that I don't understand. I have seen very senior people pretend that they understand and then, when they began to explain to someone else, realize that they had no idea what they were talking about. Our industry uses these terms and abbreviations (or jargon, if you like) with the assumption that the audience always shares our level of understanding. Following a very good presentation on upstream and downstream strategies made by a former manager to the entire subsidiary, during which everyone shook their heads in agreement, I was approached by several people and asked to explain what upstream and downstream were. We should not be afraid to ask about what we don't understand nor should we make it uncomfortable for those to whom we are speaking to ask us. Not long ago, I was involved in an exercise related to the way a company wanted to work. The task was to use the model to plan a project to install rain gutters. We raced off and were, virtually, ordering tools, and parts and planning the job. Before we got too far along, it became obvious that at least two of the people involved in this process had absolutely no idea what rain gutters were, even though they were happily and enthusiastically ready to install them.

By the way, my most recent unfamiliar abbreviation came from the header of one of the columns on a mudlog. It was "MSE". It took me a while, but after asking friends and doing a bit of independent research, I now know that it stands for Mechanical Specific Energy and is a way to measure and help improve drilling efficiency. Can't go any further than that, but I have learned a little something new. ■

Take care. Until next month.

Applied Geoscience Conference

FEBRUARY 16-17, 2015


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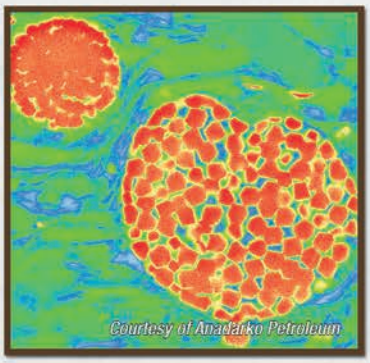
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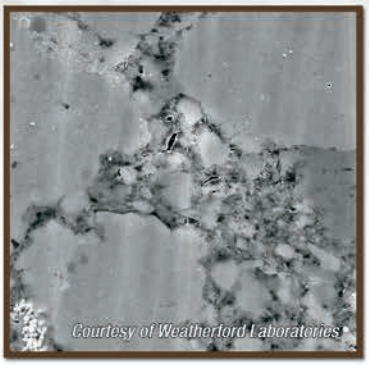
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Integrated Approaches of Unconventional Reservoir Assessment and Optimization

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- Integrated Reservoir Characterization Focusing on Macro to Micro to Nano-scale Components
- Natural Fracture Systems & Producibility
- Reservoir Characterization of Lacustrine Mudrock Systems
- Hybrid Unconventional Systems - Tight Targets

Day 2:

- Geologically-driven Completion Techniques in Unconventional Reservoirs
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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

For more information and to register please visit: www.hgs.org

Applied Geoscience Conference

FEBRUARY 16-17, 2015

Oral Presentations – Monday, February 16, 2015

7:00	**Registration & Coffee**	
8:00 - 8:10	Welcome and Opening Remarks	
	Session 1: Integrative Reservoir Characterization Focusing on Macro to Micro to Nano-Scale **Sesson Chairs: Frank Walles,** *Baker Hughes* and **Mike Van Horn,** *Independent*	
8:10 - 8:45	Reservoir Characterization of Mudrock Systems Nano to Macro, with Case Examples from the Horn River and Western Canadian Basins	**Rene Jonk**, *ExxonMobil,* Ken Potma, *Imperial Oil*
8:45 - 9:20	Defining the Depositional Sweetspot of a Mudstone Play Fairway: an Example from the Utica/Pt. Pleasant	**Jesse Melick,** Jesse Koch, *BP*
9:20 - 9:55	Computed Tomography (CT) Scans: Frameworks for Mudstone Reservoir Characterization	**Joan Spaw,** *Marathon Oil Company*
9:55 - 10:25	**Coffee, Core Displays and Exhibitor Presentations**	
	Session 2: Geomechanical Controls and Producibility **Sesson Chairs: Obie Djordjevic,** *Murphy Oil* and **Matt Williams,** *SWN*	
10:25 - 11:00	Control of Mechanical Stratigraphy on Bed-Restricted Jointing and Normal Faulting in the Eagle Ford Formation, South-Central Texas, U.S.A	**David A. Ferrill,** Ronald N. McGinnis, Alan P. Morris, Kevin J. Smart et al., *Southwest Research Institute*
11:00 - 11:35	Limestone Frequency and Well Performance, Eagle Ford Shale (Cretaceous), South Texas	**John Breyer,** R. H. Wilty et al., *Marathon Oil Company*
11:35 - 1:00	**Lunch, Poster and Exhibitor Presentations**	
	Session 3: Reservoir Characterization of Lacustrine Mudrock Systems **Sesson Chairs: Michael Cameron,** *Hess* and **Christina Calvin,** *Schlumberger*	
1:00 - 1:35	Basin-Scale Controls on Lacustrine Organic-Rich Mudstone Deposition: Examples from Wyoming and China	**Alan R. Carroll,** *University of Wisconsin*
1:35 - 2:10	A Depositional Model and Stratigraphic Framework of the Uinta Basin, Utah	**Lauren P. Birgenheier,** et al.
2:10 - 2:45	Permian Lacustrine Unconventional Shales as Hyrocarbon Targets in the Cooper Basin, Australia: Rock Characteristics and Well and Production Challenges	**Raphael A.J. Wüst ,** Anthony Hill, Quaid Jadoon, Brent R. Nassichu, Nicole Willment, Elinor M. Alexander
2:45 - 3:15	**Coffee, Core Displays and Exhibitor Presentations**	
	Session 4: Hybrid Unconventional Systems - Tight Targets **Sesson Chairs: Wayne Camp,** *Anadarko* and **Simon Hughes,** *Weatherford*	
3:15 - 3:50	From the Arch to the Uplift: Depositional Changes in the Cenomanian-Turonian Interval (Eagle Ford and Woodbine)	**J.A. Breyer,** R.A. Denne and D.A. Bush, *Marathon Oil Company*
3:50 - 4:25	How Mobile is Your Total Oil Saturation? SARA Analysis Implications for Bitumen Viscosity and UV Fluorescence in Niobrara Marl and Bakken Shale, sSupported by FIB-SEM Observations of Kerogen, Bitumen, and Residual Oil Saturations within Niobrara Marls and Chalks	**Mark Sonnenfeld,** *Whiting Petroleum*
4:25 - 5:00	Formation Evaluation and Basin Architecture of the Wolfcamp Shale in the Delaware Basin	**Gilles Hennenfent,** *Chevron*
5:00 - 7:00	**Social Hour –** *Fourth Floor Atrium* **Poster Presentations by Invited Graduate Students**	

Applied Geoscience Conference

FEBRUARY 16-17, 2015

Oral Presentations – Tuesday, February 17, 2015

7:00	**Registration & Coffee**	
8:00 - 8:10	Welcome and Opening Remarks	
	Session 5: Mudrock Systems Characterization – Advanced Geophysical Insights **Sesson Chairs: Paul Collins** and **Lisa Neelen,** *Statoil*	
8:10 - 8:45	Microseismic Geomechanics of a Hydraulic Fracture Network	**Shawn Maxwell,** *IMaGE—Itasca Microseismic and Geomechanics Evaluation*
8:45 - 9:20	A Framework for Understanding the Geomechanics of Hydraulic Fracture Induced Microseismicity	**Seth Busetti,** Peter Hennings, *ConocoPhillips*
9:20 - 9:55	The Signature of Shearing Driven by Hydraulic Opening	**Jim Rutledge,** *Schlumberger*
9:55 - 10:25	**Coffee, Core Displays and Exhibitor Presentations**	
	Session 6: Geologically-Driven Completion Techniques in Unconventional Reservoirs **Sesson Chairs: Gretchen Gillis,** *Aramco* and **John Breyer,** *Marathon*	
10:25 - 11:00	Horizontal Well Stress Index Estimation from Litho Scanner, Sonic Scanner and DRIFTS Analysis of Cuttings	**Mike Herron**, *Schlumberger*
11:00 - 11:35	The Utilization of Reservoir Characterization Data for Optimizing Well Spacing and Completion Techniques in the Eagle Ford Shale	**Beth McDonald,** Neil Basu, Beau Tinnin, Gervasio Barzola, *Pioneer Natural Resources*
11:35 - 1:00	**Lunch, Poster and Exhibitor Presentations**	
	Session 7: What's Going on Down There? Clues from Produced Fluids and Proppant **Sesson Chairs: L. Taras Bryndzia,** *Shell* and **R. Lafollette,** *Baker Hughes*	
1:00 - 1:35	Controls and Origin of High Salinities in Hydraulic Fracture Flow Back Brines – An Example from the Marcellus Gas Shale, USA	**L. Taras Bryndzia**, *Shell International Exploration and Production Inc*
1:35 - 2:10	Proppant Stability in the Downhole Environment	**Randy LaFollette,** *Baker Hughes Pressure Pumping*
2:10 - 2:45	Is that Formation Water or Frac Water Being Produced – What We Can Learn from Ionic and Isotopic Analyses of Produced Waters from Horizontal Wells in the Permian Basin?	**Matthew Laughland, Ph.D.,** Dave Nelson, and Paul Wilson, *Pioneer Natural Resources, USA, Inc.*
2:45 - 3:15	**Coffee, Core Displays and Exhibitor Presentations**	
	Session 8: Bringing It all Together: How Reservoir Characterization Improves Stimulation and Production **Sesson Chairs: Mark Andreason,** *Sinochem E&P* and **Roberto Suarez-Rivera,** *WD Van Gonten*	
3:15 - 3:50	Shale Resource Assessment and Development – A Full Life Cycle Integrated Approach	**P.K. Pande,** *Anadarko Petroleum Corporation*
3:50 - 4:20	Wolfcamp Completion Optimization	**Tom Schickle**, *Shell*

Core Displays - Eagle Ford, Utica, Niobrara, and Wolfcamp

Selected Core from Emerging and Established Unconventional Reservoirs Supporting the Oral Technical Presentations

Open during Coffee and Lunch Breaks • Fourth Floor – Cedar and Cypress Rooms

Poster Session

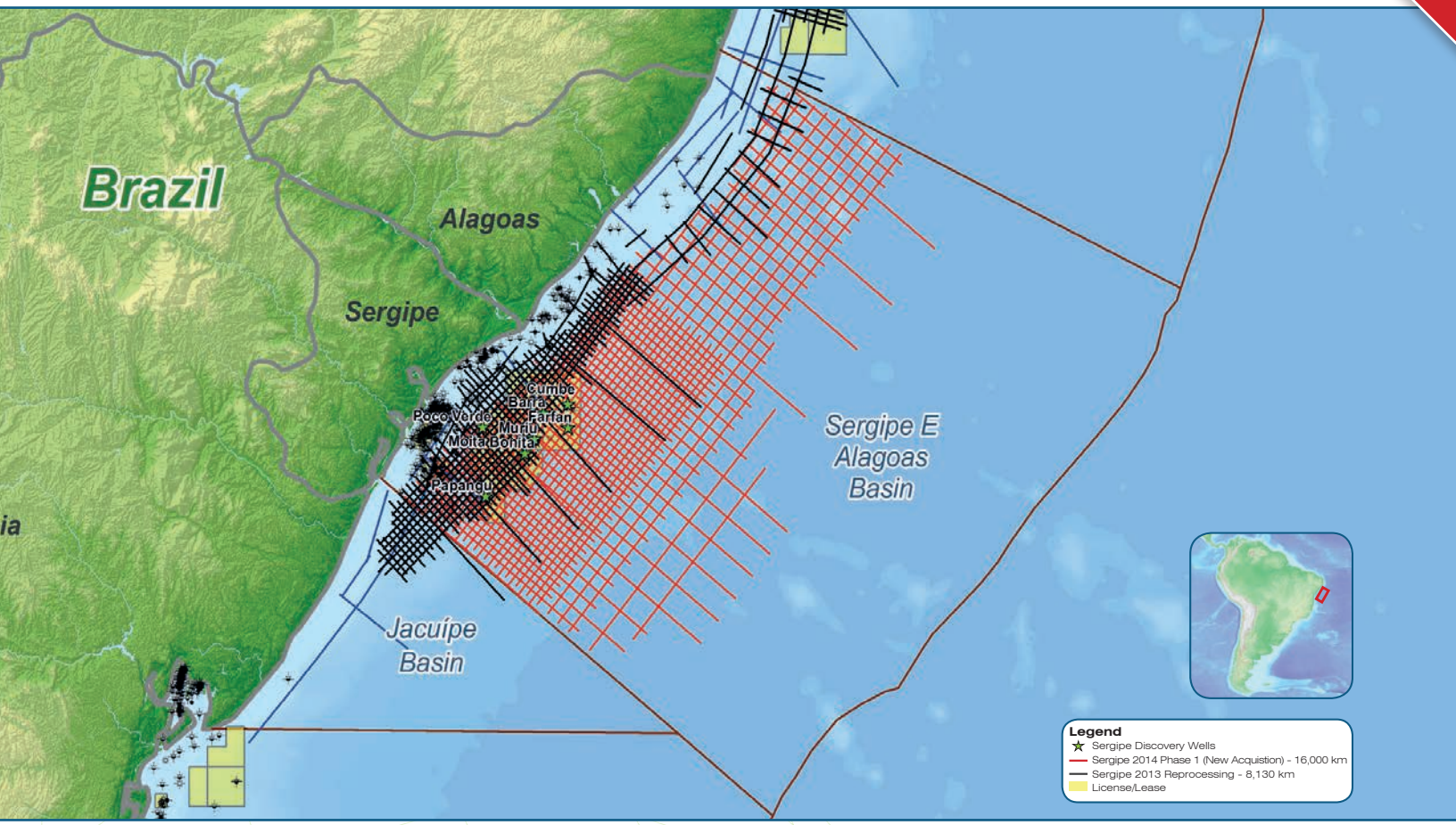
Invited Presentations from Graduate Students

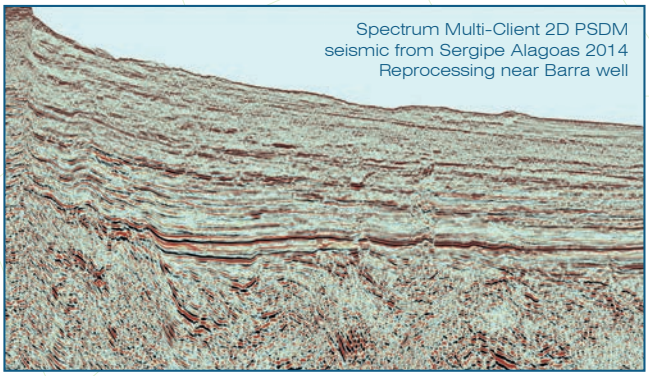
Open during Monday Social Hour and Lunch Breaks • Fourth Floor – Pecan Room

visit us at SEG, Denver booth #554

Brazil: Sergipe Alagoas

New 2D Multi-Client Seismic Data Available





Spectrum Multi-Client 2D PSDM seismic from Sergipe Alagoas 2014 Reprocessing near Barra well

Spectrum has commenced a 16,000 km Multi-Client 2D seismic survey offshore Brazil in the Sergipe and Alagoas Basins along the Eastern Margin of Brazil. The new acquisition program will tie key wells in the Basins including the recent Barra, Muriu, and Farfan discoveries. PreSTM and PreSDM data will be available in Q4 2014.

To supplement the new acquisition in this active exploration area, Spectrum has completed the reprocessing of 8,130 km of data through both PreSTM and PreSDM and is offering this data to industry in order to gain a head start on the expected upcoming round in 2015.

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Spectrum

Monday, February 9, 2015

Westchase Hilton • 9999 Westheimer

Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $45 Preregistered members; $50 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.

HGS General Dinner Meeting

Dr. Barry Lefer and
Dr. James M. Rine

Anthropogenic Climate Change – A Growing Awareness in the Oil and Gas Industry

Table 1. *Petroleum Company Statements on Climate Change*

Company	Statement Excerpts (as of June 2014)
Apache Corporation	At Apache, managing and reducing greenhouse gas (GHG) emissions have become an important part of our operations
BP	BP believes that climate change is an important long-term issue that justifies global action
Chevron Corporation	At Chevron, we recognize and share the concerns of governments and the public about climate change. The use of fossil fuels to meet the world's energy needs is a contributor to an increase in greenhouse gases (GHGs)—mainly carbon dioxide (CO_2)—in the Earth's atmosphere
ConocoPhillips	ConocoPhillips recognizes that human activity, including the burning of fossil fuels, is contributing to increased concentrations of greenhouse gases (GHG) in the atmosphere that can lead to adverse changes in global climate
Devon Energy Corporation	We recognize that climate change has drawn the attention of many of our stakeholders. As an energy company, we have been engaged in emissions reduction for a quarter century
ExxonMobil	The risks of climate change are serious enough to warrant cost-effective policy responses that balance mitigation, adaptation, and other social priorities
Hess Corporation	We recognize that climate change is a global environmental concern with potentially significant consequences for society, including the energy industry
Shell Global	CO_2 emissions must be reduced to avoid serious climate change. To manage CO_2, governments and industry must work together
Total	A third of the world's greenhouse gas emissions are oil and gas related. To meet our responsibilities, we are working to curb the carbon emissions generated by our facilities and, less directly, the use of our products

* Statements are from company websites.

Introduction

Nine medium to major petroleum companies which do business in the USA are currently factoring in some kind of carbon emission restrictions into their long-range business plans (**Table 1**; CDP, 2013). One driver for these plans is the fact that the vast majority of countries, including the largest CO_2 emitters (China, USA, Russia), have formally agreed to limit their CO_2 emissions to avoid a 2°C (3.6°F) rise in global temperatures in the future. Based on the content of company websites, however, their long range plans may also be based on awareness that global warming is occurring and the need to start business-planning for it (**Table 1**).

This talk is given in two parts. The first part (presented by Barry Lefer), explains some basics of climate science and presents the evidence showing that man-induced CO_2 emissions are the major drivers of the present day global warming trend. The second portion (presented by Jim Rine) explores some basic economics of the climate change issue and how government response may impact the petroleum industry.

Climate Science

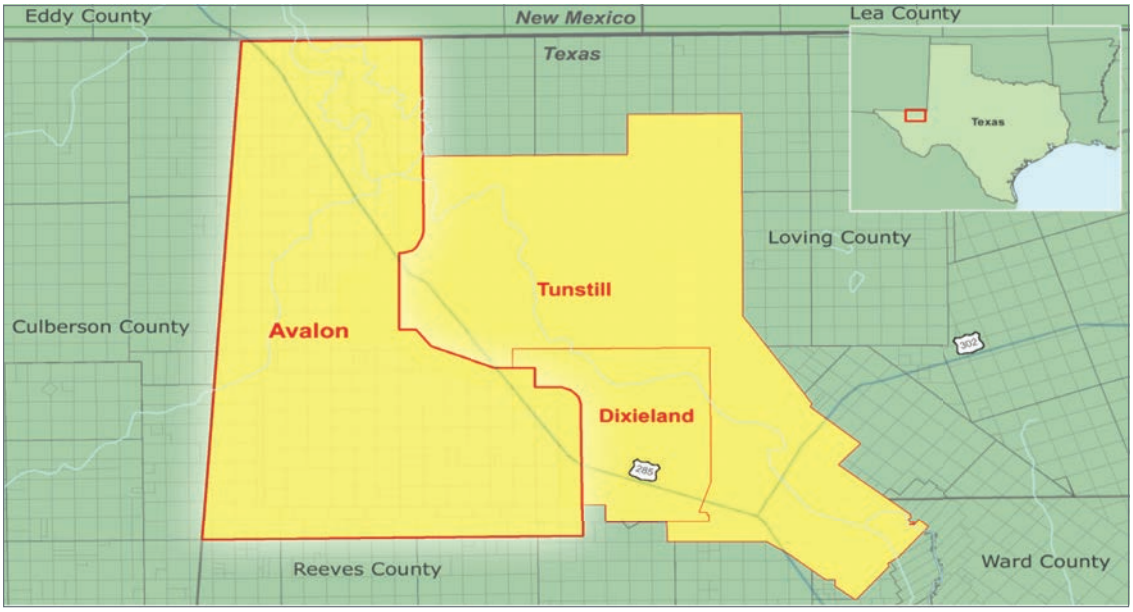
The geosciences community agrees with the following empirical geophysical data:

1. the Earth's average surface temperature has warmed by ~0.7°C since 1900, and
2. the concentrations of greenhouse gases (e.g., CO_2, CH_4, N_2O) have substantially increased in the atmosphere over the last 100 years due to human activities. These two geophysical datasets are physically related to each other. As we have

HGS General Dinner *continued on page 19*

Avalon 3D Seismic Survey

A new state-of-the-art multi-client solution in the prolific Delaware Basin



Located in one of North America's most prolific basins, the newly acquired 282 square mile high-end 3D seismic survey offers four hundred fold broadband data. Setting a new standard, Avalon will allow better imaging to address the noise and statics challenges in the area.

Targeting the Bone Springs, Wolfcamp and Cline formations, the complete solution ties the geophysical data to the geology enabling enhanced sweet spot detection and improved hazard avoidance for optimal well placement. The project uses a multi-disciplinary approach comprising advanced imaging, reservoir characterization and microseismic monitoring.

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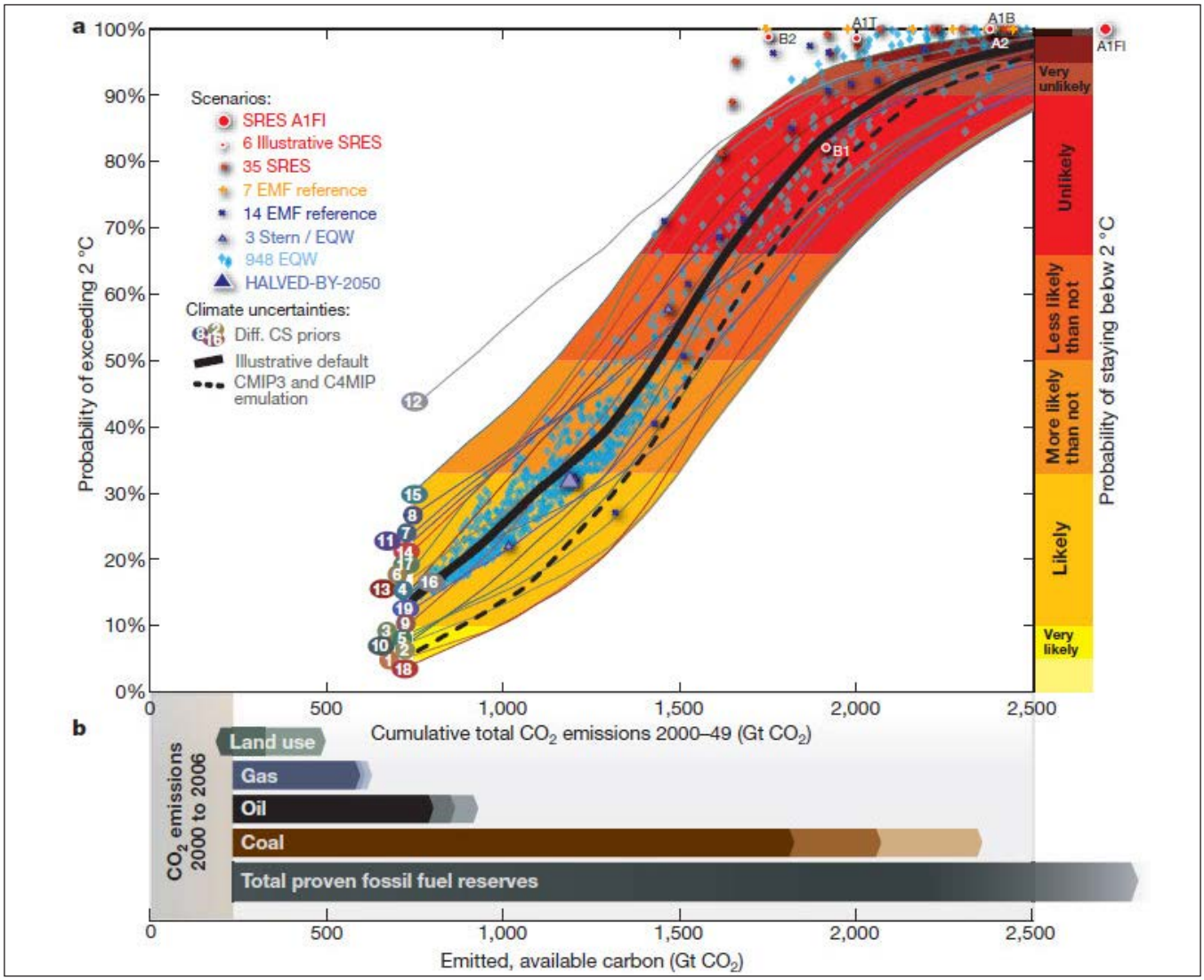

Figure 1. *Graphical representation is from Meinshausen et al. (2009).* **a** *shows range of probabilities of exceeding 2°C (3.6°F) versus cumulative total CO_2 emitted between 2000 and 2049 based on 18 models.* **b** *shows total potential CO_2 emissions derived from the consumption of fossil fuels and land use activities with the gray area denoting emissions from period 2000-2006.*

known for more than 100 years, greenhouse gases (like CO_2) absorb heat and then re-radiate it in all directions, causing, among other things, the Earth's atmosphere and oceans to warm up.

All earth scientists understand that the Earth's climate has been changing almost continuously as a result of natural causes for several hundred million years or more, and likely over the entirety of the Earth's history. The various natural mechanisms for climate change all relate to a number of external and internal forcings that alter the Earth's radiation budget. These mechanisms can be further subdivided into those that directly or indirectly alter energy inputs to, or outputs from, the Earth's climate system. Over the past 100 years the natural climate forcings due to plate tectonics and volcanic activity, as well as the changes in the Earth's orbit and the intensity of the Sun, are all well measured and do not explain the nature, the rate, nor the magnitude of the observed global warming over the past 50 years. Needless to say, the evidence for a human hand in the recent warming is overwhelming.

The heart of "the greenhouse debate" among scientists is not whether rising greenhouse gas levels have contributed to the warming, but it is rather the magnitude of the amplification of the warming by various feedbacks. In other words, how warm is it going to get if we keep along our current "business as usual" path? The U.S. National Research Council asserts that "Climate change is occurring, is very likely caused by human activities, and poses significant risks for a broad range of human and natural systems" (NRC, 2011). As U.S. 2014 National Climate Assessment concluded: "Climate change will bring economic and environmental challenges as well as opportunities" (Walsh et al., 2014). So we would argue that the real question to be debated

HGS General Dinner *continued on page 21*

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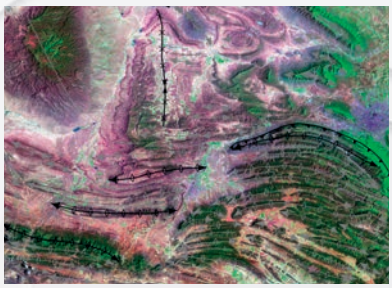
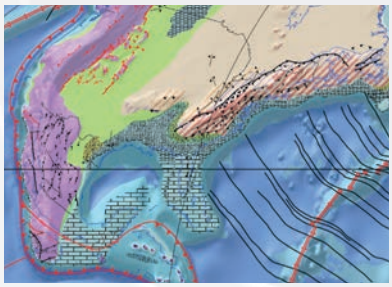
New structural mapping and depth-to-basement based on unique high resolution gravity and magnetic data. *New* plate tectonic model.



Globe: US & Mexico

Getech is pleased to announce that its flagship new ventures platform, *Globe*, is now available for the Lower 48 states of the US, Mexico and the Gulf of Mexico.



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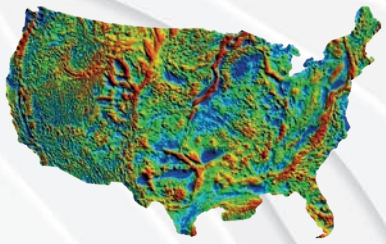

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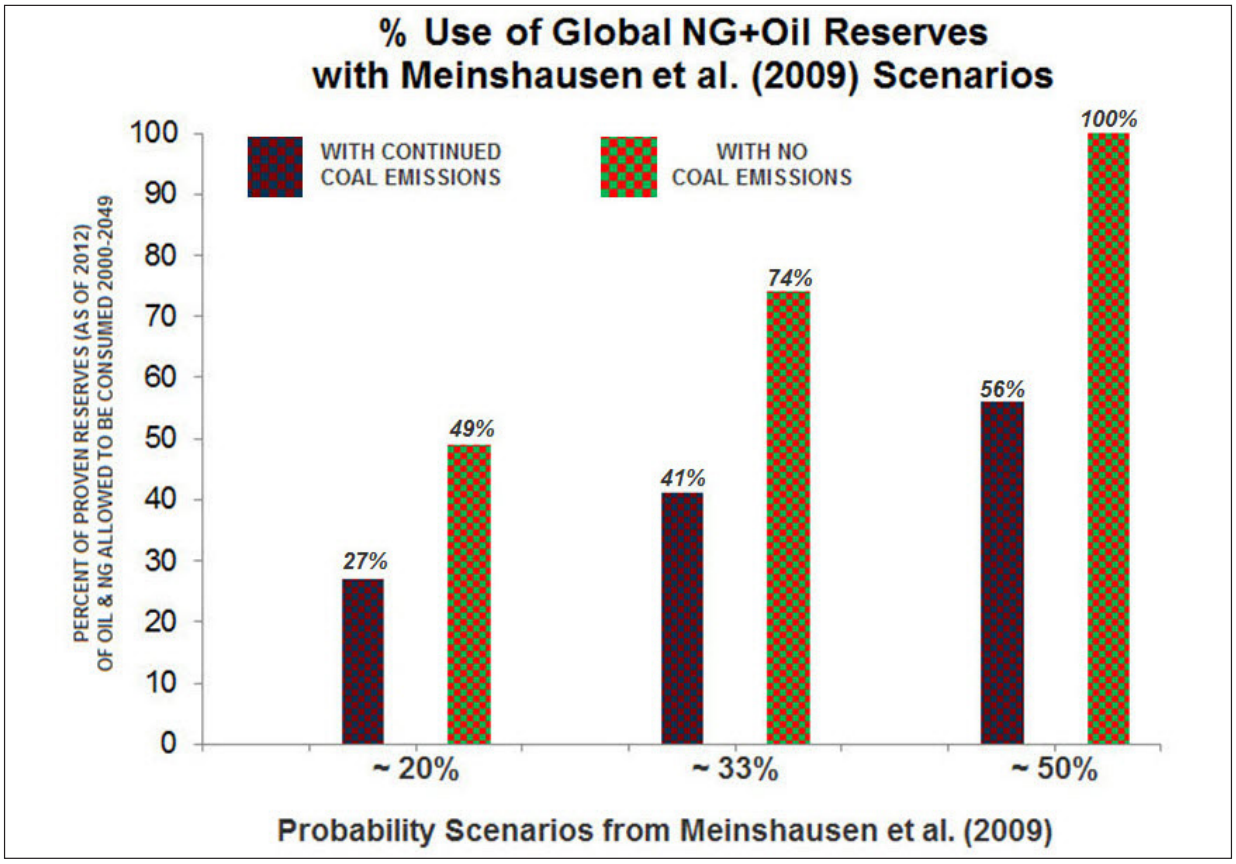

Figure 2. *Histogram graphically contrasts allowable oil and natural gas consumption under three Meinshausen et al. (2009) scenarios with continued rates of coal consumption versus complete cessation of coal emissions. Emission calculations use conversion formulas from (EIA, 2013; Table 2) and proven reserves and rates of consumption (as of 2012) from BP (2013a). Figure is from Rine (2014).*

should not be: "Is the Earth's climate warming?" Rather, moving forward we would like to discuss "What can and should we do to minimize the negative impacts of climate change that will continue to worsen if we continue to do nothing?"

Climate Policies and the Industry

The Copenhagen Accord (UNFCCC, 2010) committed 167 countries (including the USA, China, and Russia) to limit carbon emissions to levels that will theoretically avoid global warming in excess of 2°C (6.3°F). In this agreement, "Parties commit to implement individually or jointly the quantified economy-wide emissions targets…" (UNFCCC, 2010). What measures these signatory countries will take individually or as a group to reduce green house gas emissions are to be determined at the next Conference of the Parties on Climate Change meeting to be held in Paris in 2015 with measures to restrict carbon emissions starting in 2020 (UNFCCC, 2012). Because there is no agreement yet on a set number of allowable emissions, this presentation utilizes estimated carbon budgets from Meinshausen et al. (2009; **Figure 1**).

Analysis of the carbon budgets from the Meinshausen et al. (2009) and publicly accessible global fossil fuel production and reserve values yields some interesting results. First, potential CO_2 emissions from oil and natural gas reserves comprise only 33% of the potential total emissions, with the remainder from coal. Secondly, under a ~50% probability scenario of exceeding 2°C, all proven reserves of oil and natural gas (as of 2012) could be consumed without reaching the modeled CO_2 budget, under the hypothetical case of no further coal consumption (**Figure 2**). Companies with major holdings of natural gas, such as ExxonMobil and Shell, have more than likely made similar (albeit more sophisticated) analyses and, consequently, are promoting their natural gas as a cleaner source of energy.

But what can be done to lower our overall CO_2 emissions with many political forces largely hostile to both "taxes" and environmental regulations? One market approach, which enjoys support from a diverse political spectrum, is a revenue neutral carbon tax, (a.k.a., carbon fee and dividend). "ExxonMobil would support a carbon tax if it were paired with an equal cut elsewhere in the tax code…" (Davenport, 2013). James Hansen, former NASA climate scientist, opposes cap and trade (as does Rex Tillerson, Chairman/CEO of ExxonMobil) and instead endorses the fee and dividend approach where "… 100% of the money collected from the fossil fuel companies at the mine or the well is distributed uniformly to the public" (Hansen, 2009). (More information about carbon fee and dividend is available

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from Citizens' Climate Lobby http://citizensclimatelobby.org/carbon-fee-and-dividend/ .)

In closing, although many petroleum companies realize climate change will eventually affect their profitability, they appear to have made the decision to recognize the problem and push solutions that will, at least in the next few decades, decrease their losses or even be profitable. ■

Biographical Sketches

Barry Lefer is associate professor of Earth and Atmospheric Sciences and is currently associate chair of the Department of Earth and Atmospheric Sciences in the College of Natural Sciences and Mathematics at the University of Houston. He received a B.A. in Environmental Sciences from the University of Virginia and M.S. and Ph.D. degrees in Earth Sciences-Geochemical Systems from the University of New Hampshire. After achieving his doctorate degree, he accepted a Post-Doc position at the National Center for Atmospheric Research (NCAR), Atmospheric Chemistry Division, Boulder, CO. He was later hired as a Project Scientist for NCAR and spent a total of seven years there before joining the faculty at UH in 2004. Dr. Lefer's areas of research include the impact of clouds, urban aerosol, and Asian dust on photolysis frequencies and ozone photochemistry; photochemical reactions occurring within a snow-pack, measurements of industrial emissions; and the relationship between meteorology and air quality. More recently the Lefer group has expanded their research efforts to include the health effects of air pollution. Dr. Lefer has been published more than 130 peer reviewed papers in high impact journals such as *Atmospheric Chemistry and Physics, Journal of Geophysical Research, Atmospheric Environment,* and *Journal of Atmospheric and Oceanic Technology.* Since joining the University of Houston in 2004, he has been PI or co-PI on over 38 research projects with grants totaling more than $8 million.

James M. Rine first joined HGS after moving to Houston from the Cities Service Research Center in Tulsa in the mid 1980's. Jim received his doctoral degree in 1980 from the Rosenstiel School of Marine and Atmospheric Sciences (RSMAS) at the University of Miami (FL) where he studied modern shallow marine mud environments. His research at RSMAS resulted in an SEPM outstanding paper award for his 1985 *Journal of Sedimentary Petrology* paper co-authored with R. N. Ginsburg. Since then, Rine has published on a variety of topics ranging from studies of modern continental shelf sands and muds to depositional history of a giant oil field in the Gulf of Suez, groundwater hydrogeology of portions of the South Carolina coastal plain, and characteristics of porosities in siliciclastic mud rocks. After more than a decade at the University of South Carolina's Earth Sciences and Resources Institute, Dr. Rine returned to Houston in 2004 where he has since been employed in the geological services industry. This is Jim's sixth presentation to HGS.

References Cited

BP, 2013, BP Statistical Review of World Energy 2013, <http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf> (accessed January 1, 2014).

CDP, 2013, Use of internal carbon price by companies as incentive and strategic planning tool, A review of findings from CDP 2013 disclosure: CDP North America, NY, NY, pp 10, <https://www.cdp.net/CDPResults/companies-carbon-pricing-2013.pdf> (accessed January 1, 2014).

Davenport, C., 2013, Large Companies Prepared to Pay Price on Carbon: *New York Times*, business/energy-environment, < http://

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www.nytimes.com/2013/12/05/business/energy-environment/large-companies-prepared-to-pay-price-on-carbon.html?_r=0 (accessed June 2, 2014).

EIA, 2013, Frequently asked questions: How much carbon dioxide (CO_2) is produced when different fuels are burned?: U.S. Energy Information Administration, <http://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11 > (accessed January 1, 2014).

Hansen, J., 2009, *Storms of my Grandchildren – The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*: Bloomsbury USA, New York, Berlin, London, 304 p.

Meinshausen, M., N. Meinshausen, W.Hare, S.C.B. Raper, K. Frieler, R. Knutti, D.J. Frame, and M.R. Allen, 2009, Greenhouse-gas emission targets for limiting global warming to 2° C: *Nature*, v 458, p 1158-1162.

National Research Council. America's Climate Choices: The National Academies Press, Washington D.C., 2011.

An Examination of Carbon Budgets, Carbon Taxes, Industry Attitudes to Global Warming, and AAPG: *Environmental Geosciences*, v. 21, No. 4 (December 2014), p. 127-140.

United Nations Framework Convention on Climate Change (UNFCCC), 2010, Report on the conference of the parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2011 – Addendum: Part Two: Action taken by the Conference of the Parties at its fifteenth session, < http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf > (accessed June 17, 2014).

United Nations Framework Convention on Climate Change (UNFCCC), 2012, Report on the conference of the parties on its seventeenth session, held in Durban from 28 November to 11 December 2011 – Addendum: Part Two: Action taken by Conference of the Parties at its seventeenth session, < http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf > (accessed June 17, 2014).

Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, S. Doney, R. Feely, P. Hennon, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville, 2014: Ch. 2: Our Changing Climate. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 19-67. doi:10.7930/J0KW5CXT. http://nca2014.globalchange.gov/report/our-changing-climate/introduction

Wednesday, February 11, 2015

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.

Social 5:30 p.m., Dinner 6:30 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.

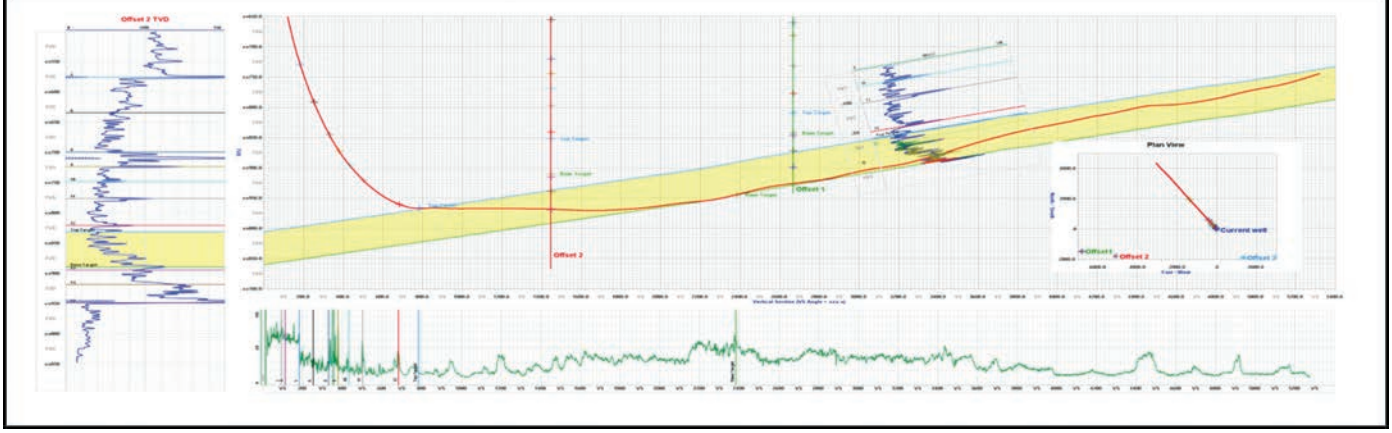
T. Wesley McCoy, P.G., C.P.G.
Texas Board of Professional Geoscientists
Austin, TX

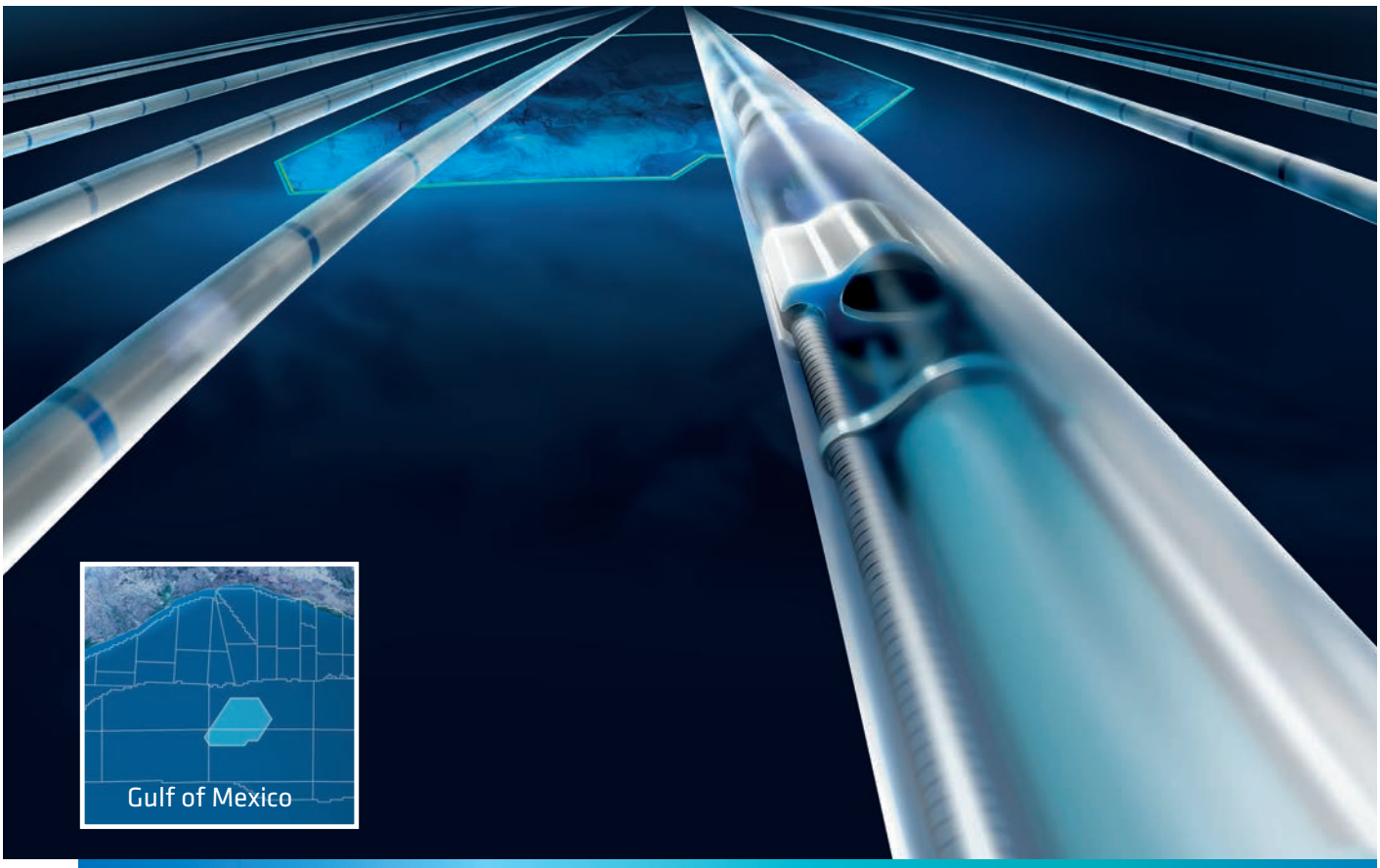
TBPG Ethics Presentation

The Texas Board of Professional Geoscientists (TBPG) was authorized by legislative statute in 2001 as the agency responsible for administering the Texas Geoscience Practice Act (the Act) and has been conducting licensing of Professional Geoscientists in Texas since the Act became fully effective on September 1, 2003. TBPG is also involved in compliance and enforcement actions resulting from its administration of the Act and TBPG rules. In 2013, Senate Bill 138 became law and amends the Act, Texas Occupations Code 1002, to require state agencies to report violations of the Act to the TBPG, and mandates that TBPG conduct training on the requirements of the Act and TBPG rules for state agencies. TBPG is also responsible for providing ethics training for Professional Geoscientists to assist license holders in issues regarding professional conduct and the Code of Professional Conduct, which is under TBPG rules, Texas Administrative Code Chapter 851. ■

Biographical Sketch

Wesley McCoy is a graduate of The University of Texas at Austin with a B.Sc. in Geological Sciences and has worked as a geologist for the Texas Department of Water Resources, the Texas Water Development Board and the Texas Commission on Environmental Quality. He is currently the Enforcement Coordinator with the Texas Board of Professional Geoscientists. He is a licensed Professional Geoscientist in Texas, a Registered Professional Geologist in Mississippi, and is a Certified Professional Geologist through the American Institute of Professional Geologists. He is a member of the Association of Environmental and Engineering Geologists.





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Monday, February 16, 2015

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Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $45 Preregistered members; $50 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.

HGS International Dinner Meeting

Richard S. Dow
LUKOIL Overseas Offshore Projects Inc.
Richard.Dow@lukoil-overseas.com

Exploring for Turonian Reservoirs within the Paleo-Assinie Fairway, Offshore Côte d'Ivoire as seen in the Albacore-1X and Capitaine East-1X Exploration Wells; De-risking with better Seismic Data and Geologic Models

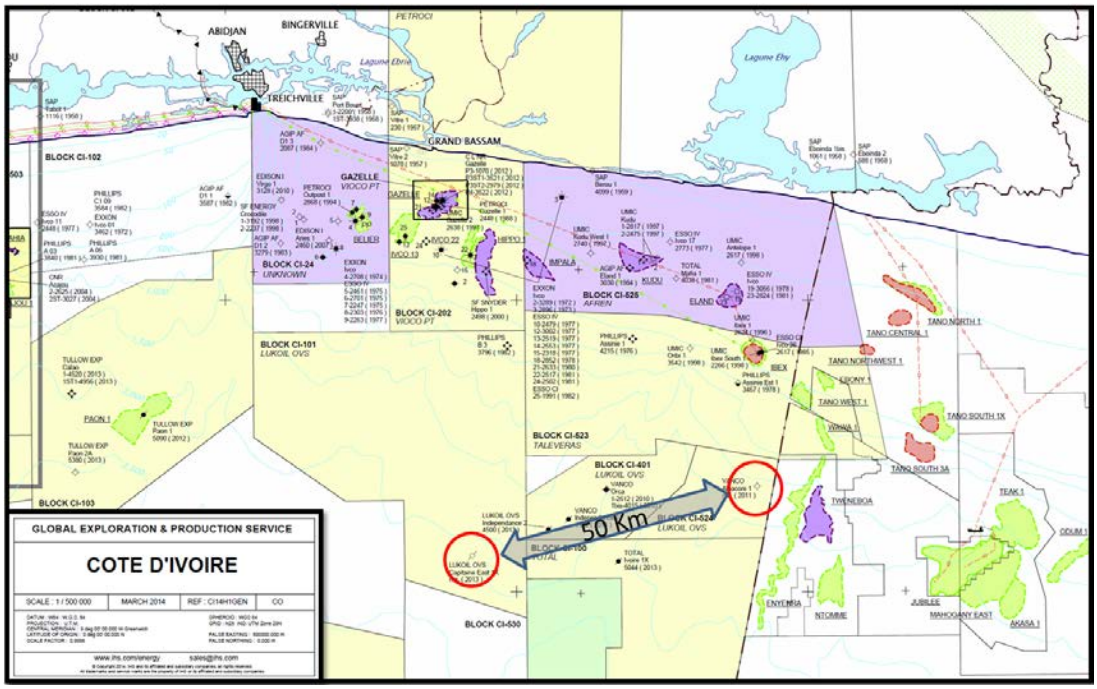

Figure 1. *Eastern Offshore Côte d'Ivoire index map*

The Albacore Prospect lies near the center of the Tano-Ivorian Basin in eastern offshore Côte d'Ivoire in the easternmost portion of the CI-401 Block, approximately 114 km southeast of Abidjan and 24 km east of the Orca-1X-bis well.

Although the analog Jubilee, Tweneboa and Enyenra (Owo) discoveries exhibit AVO anomalies in the Turonian interval, the Albacore Prospect does not with the current data set. Therefore potential reservoirs are solely identified by geobody detection of the full stack amplitude 3D volume. Additional attribute analysis was not employed because of poor far angle stacks. The poor data quality was caused by a shadow effect from the overlying chaotic Campanian canyon fill facies. With the current poor quality of the far angle stacks, it was therefore believed that use of any amplitude or inversion attributes is not reliable. This condition severely limits the ability to de-risk the presence of hydrocarbons in the Turonian objectives. However, the full stack amplitudes were used to demonstrate sequence morphologies in order to interpret the possible depositional facies of each seismic sequence, understand where reservoir most likely is present and calculate potential resources.

The original Albacore drill location targeted a single Turonian

HGS International Dinner *continued on page 31*

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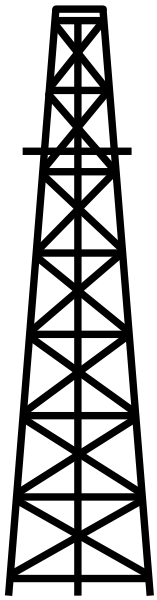

Thursday, June 11, 2015
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HGS International Dinner continued from page 29

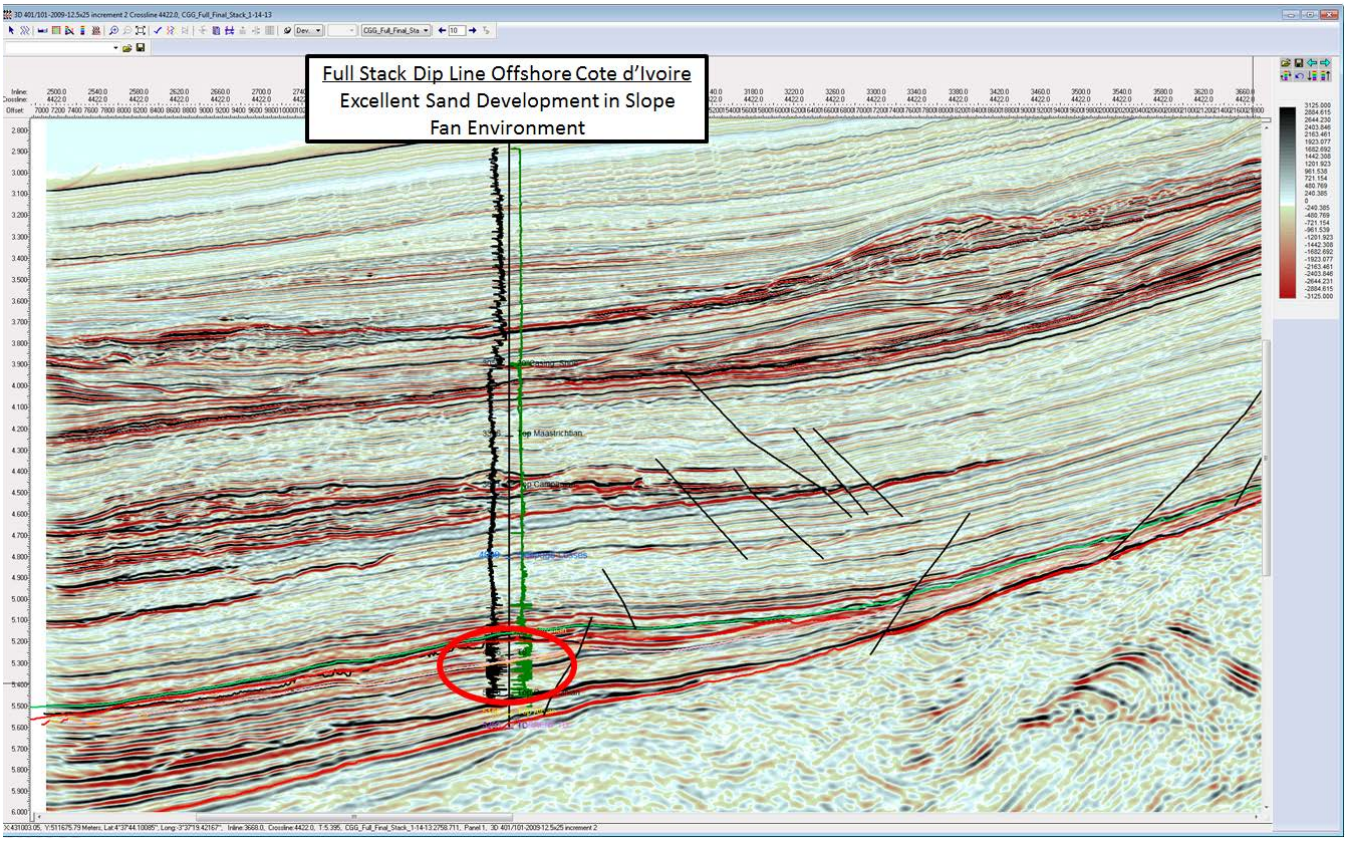


Figure 2. *Regional Seismic Line Offshore Côte d'Ivoire*

channel as seen on amplitude maps, which was deemed not economically viable and too risky as a single target and was subsequently moved to target multiple Turonian sands according to the revised geologic model. However, when drilled in 2011 the sandy intervals were not encountered, and the Turonian was found to contain mainly claystone, siltstone and rarely limestone. This interval consists of thick claystone layers alternating with thin siltstone layers, and very rarely and mainly at the middle to lower part of the interval, thin limestone layers. No oil shows were seen in this hole section.

The Capitaine East Prospect is located within the Assinie Canyon system, 50 km southwest of the Albacore-1X well, and consists of a Turonian age terminal slope fan play and underlying Cenomanian slope fan complexes deposited unconformably above the Albian. Seismic facies analysis and seismic inversion volumes derived from reprocessed PSTM 3D data suggest the Capitaine East Turonian targets consist of stacked amalgamated slope-fans that filled the mini-basin, and were subsequently overlain by sealing deep-water shales followed by Santonian and Campanian channelized slope facies fed from the north.

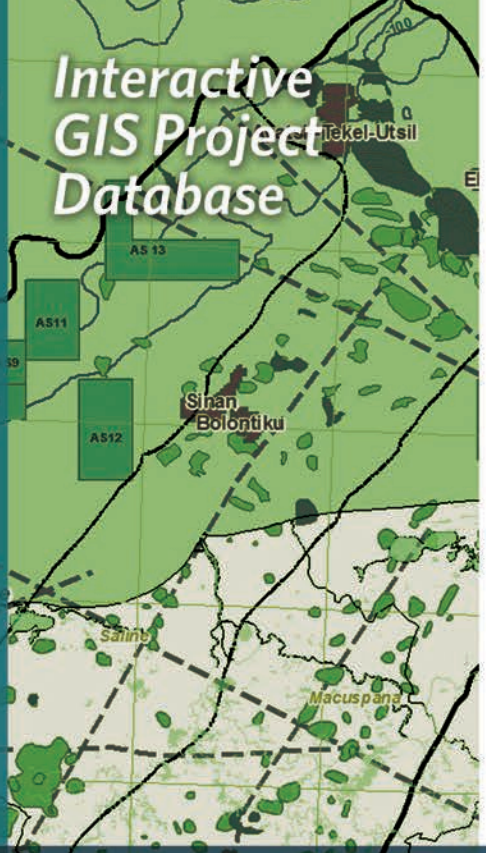
When drilled in 2014, the top-of-Turonian target was picked to correspond to a distinctive change in lithology, from overlying predominantly argillaceous sediments to a compact interval of clean sandstone accompanied by an increase in the background gas readings from 0.41% in the overlying claystone to 1.1%. The 150m gross Turonian section was drilled with 76m net reservoir with 16% average porosity. The sands exhibit good reservoir properties as observed from the drill cuttings and logs.

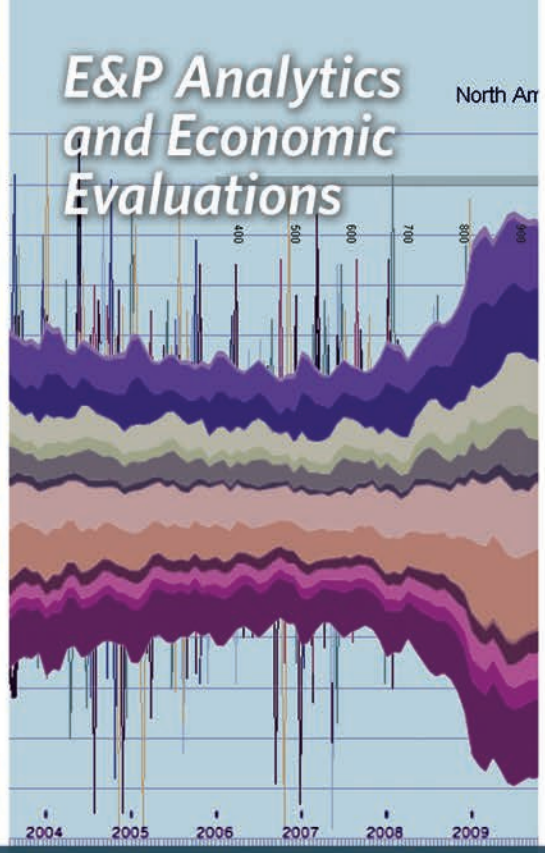
Drilling of the Capitaine East-1X well confirms the reliability of seismic inversion anomalies as indicators of reservoir presence. Predrill isopachs demonstrated localized thick Turonian sequences in an accreting channel complex. Reprocessed PSTM seismic, with concurrent revisions in regional geologic models, does facilitate reservoir prediction and decrease overall geologic risk in Turonian fairways, deep-water Côte d'Ivoire. ■

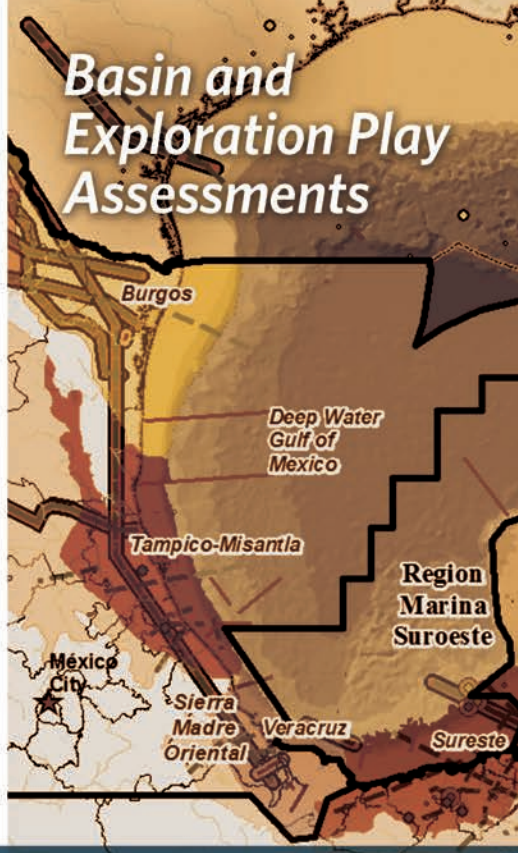
Biographical Sketch

Richard Dow is Exploration Manager, Ghana and eastern Côte d'Ivoire for Lukoil Overseas Offshore Projects Inc., a wholly-owned subsidiary of OAO LUKOIL. Currently he is managing Lukoil's exploration and appraisal efforts in the deep-water Gulf of Guinea in the West African divergent margin. After joining Lukoil as lead geophysicist in

HGS International Dinner *continued on page 33*







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HGS International Dinner continued from page 31

2010, he has generated several Late Cretaceous prospects in the West African margin including Independence and Capitaine East offshore Côte d'Ivoire. Independence is a Late Cretaceous discovery currently under evaluation and appraisal for future development.

During a 40-year career, he has generated many oil and gas prospects as well as having been responsible for numerous discoveries, primarily in the Gulf of Mexico from deep shelf to deep water. His career began in 1974 as an assistant seismologist for Western Geophysical and he subsequently worked at Superior Oil developing Frio prospects in South Texas. Later at Louisiana Land & Exploration he completed numerous evaluations, generated prospects, and drilled numerous successful wells in both the shelf and deep-water Gulf of Mexico. As team leader for El Paso Corporation, he was responsible for significantly enhancing production from core properties using advanced seismic techniques and improved geologic models. Prior to joining Lukoil he founded Dow Geosciences, an independent firm that has developed a portfolio of diverse Tertiary-age prospects and drilling opportunities on the Gulf of Mexico shelf.

Mr. Dow received his B.S. degree in Geology from Boston College, Department of Geology and Geophysics in 1974. Currently he is a licensed Professional Geoscientist, Texas (#2735) and is a Certified Petroleum Geophysicist (#61) with the AAPG. He is also a long-time member of the Houston Geological Society and the Geophysical Society of Houston. Recently he has presented his findings on Turonian reservoirs to the Director General Hydrocarbons, Côte d'Ivoire Technical Seminar in Abidjan, Côte d'Ivoire and he continues to champion high-grade prospects to Lukoil, national oil company partners and industry working-interest partners.

AAPG Imperial Barrel Award for the Gulf Coast Region

Over the past seven years since the initiation of the Imperial Barrel Award program, participation has grown from the Gulf Coast universities from 3 university teams to 13. As a result costs are rising. This year we will engage approximately 100 students and the total cost approaches $60k for costs associated with training, competition and AAPG fees. This is only $650 per student to really enhance their understanding of our business. The number of graduates of IBA program in the industry is growing. With the great crew change underway, this is an awesome tool to help students entering the workforce add value immediately.

This year the regional competition is scheduled for April 15-17 and will be held at the Schlumberger offices in the Galleria area. We are reaching out to you to help grow this valuable program. The IBA program is in need of sponsorship to cover the costs of the program and the AAPG fee. If you or your company would like to sponsor the IBA in the Gulf Coast section, please contact Janice Gregory-Sloan at gregory4@slb.com or at 713.806.5929 or Tom Bulling at bullintp@bp.com or at 281-366-2669.

GIS PAX

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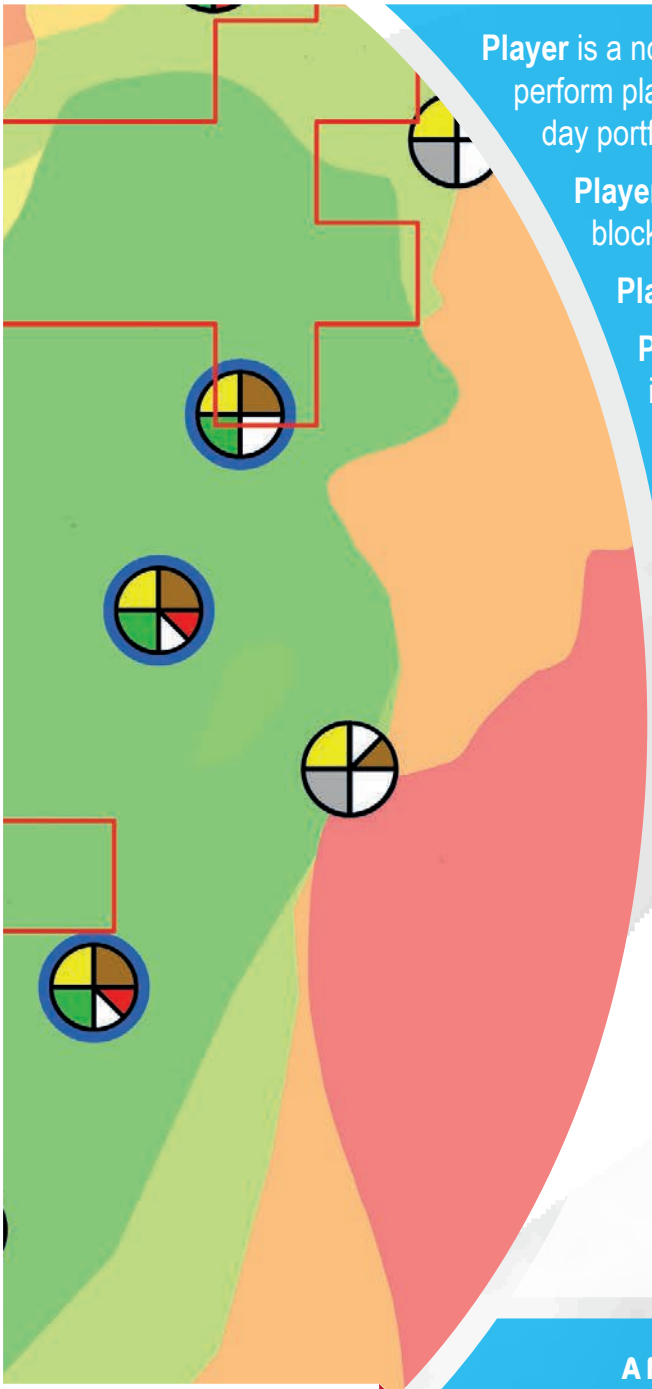
WHAT IS PLAYER?



Player is a non-specialist ArcGIS extension that helps exploring geologists perform play analysis and assists them with the management of day to day portfolio and new business decisions.

Player can produce portfolio risked volumes and values by play and block/license area.

Player is available in fixed or floating license modes.

Player has a workflow and a knowledge capture platform that is evergreen and easy to use.

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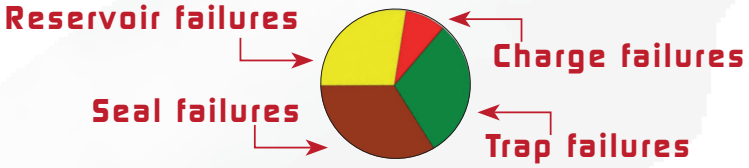

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Monday, February 23, 2015

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

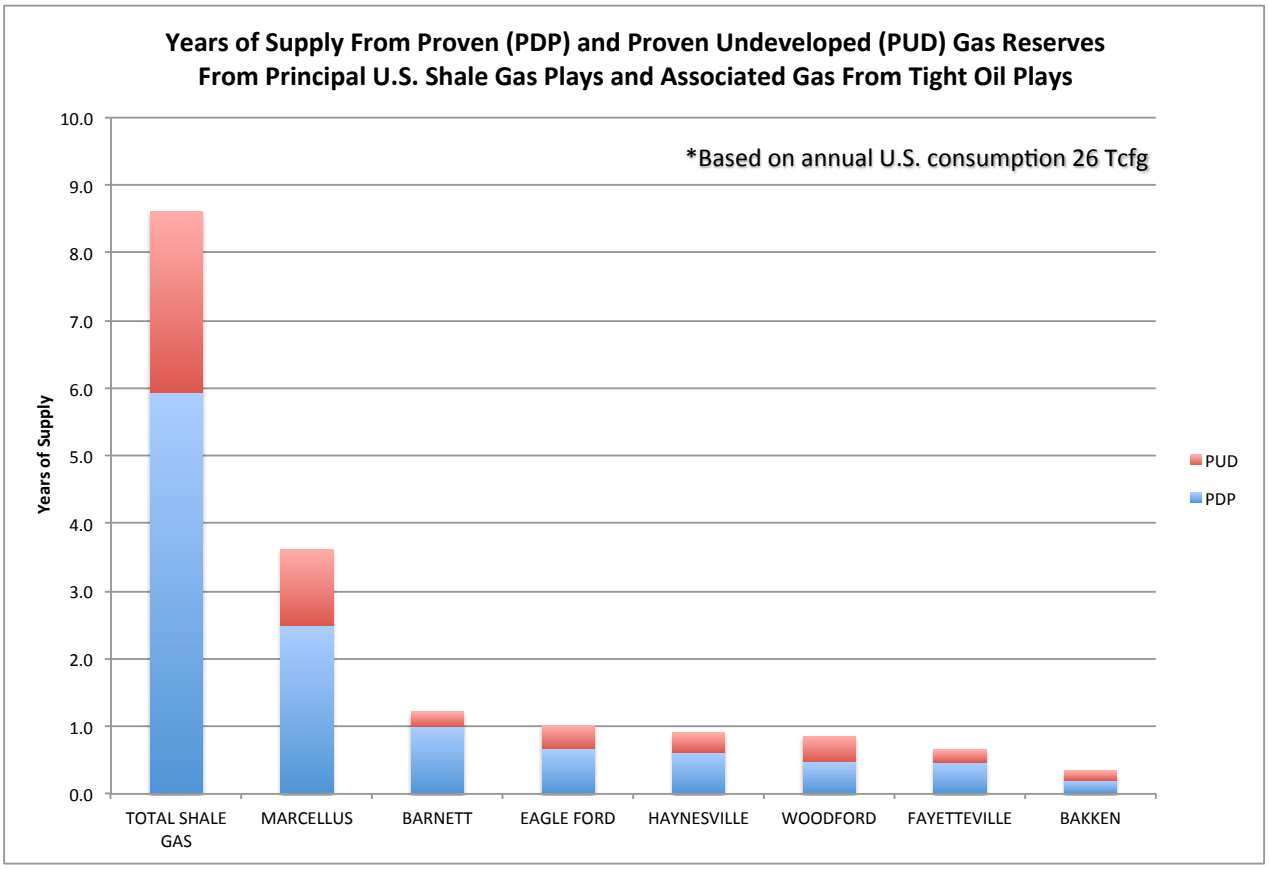
Cost: $45 Preregistered members; $50 non-members/walk-ups

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.

HGS North American Dinner Meeting

Arthur Berman and Ray Leonard

Years Not Decades: Proven Reserves and the Shale Revolution



Source: EIA

Proven reserves—not production volumes—are the most important measure of how much shale plays will change the world energy mix. In this respect, shale plays in the United States have added years, not decades, to domestic oil and gas supply. Despite all of the fanfare about the U.S. becoming the world's largest exporter of oil and gas, shale plays have produced less than two years of gas supply and less than one year of oil supply based on current U.S. consumption. Proven plus proven undeveloped reserves of shale oil and gas have stabilized at about 3 years of oil supply and 8 years of gas supply.

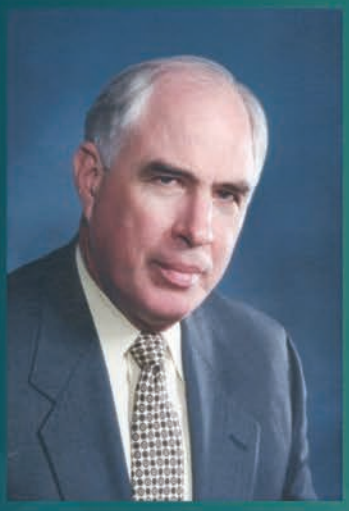
Most current shale gas production is either non-commercial or marginally profitable at current prices and will only become broadly commercial in core areas when gas prices reach approximately $6.00 per Mcf. Cash flow and balance sheet data does not reflect improvement despite claims of decreasing costs and increasing efficiency through technology. While gas production continues to rise, the rate of rise has slowed and will peak near the end of this decade.

These statements of fact are at odds with public perception. This is because many current producers of oil and gas from shale, supported by their investors, appear to tell a story about natural gas abundance that serves their interests but is not supported by facts. The story stresses success based on resource

HGS North American Dinner *continued on page 37*

2015 GSH-SEG SPRING SYMPOSIUM & EXHIBITION

Exploration frontiers: New targets, new techniques



Leon Thomsen
Honoree

A banquet toasting and roasting Leon will be held during lunch Wednesday, 11 March

A Challenge Bowl competition will be held during lunch Tuesday, 10 March

10-11 March 2015
Westchase Hilton, Houston, Texas
General Chairman: Rob Stewart, 1st VP
Technical Program Chairman: Dan Ebrom

Symposium Topics

- Shale resource properties and attributes
- New shale plays esp. Mexico, S. America
- Anisotropy, AVAZ, multicomponent seismic, FWI
- Deep-water prospects
- Ocean-bottom nodes, DAS, CSEM
- NASA on the final frontier
- *Social gathering event Tuesday evening*
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Invited speakers and extended discussion

12 invited expert speakers will present topics over the two-day symposium that will expand your understanding and challenge your thinking.

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Time is scheduled after each presentation for an extended open-floor discussion. A great opportunity for knowledge sharing!

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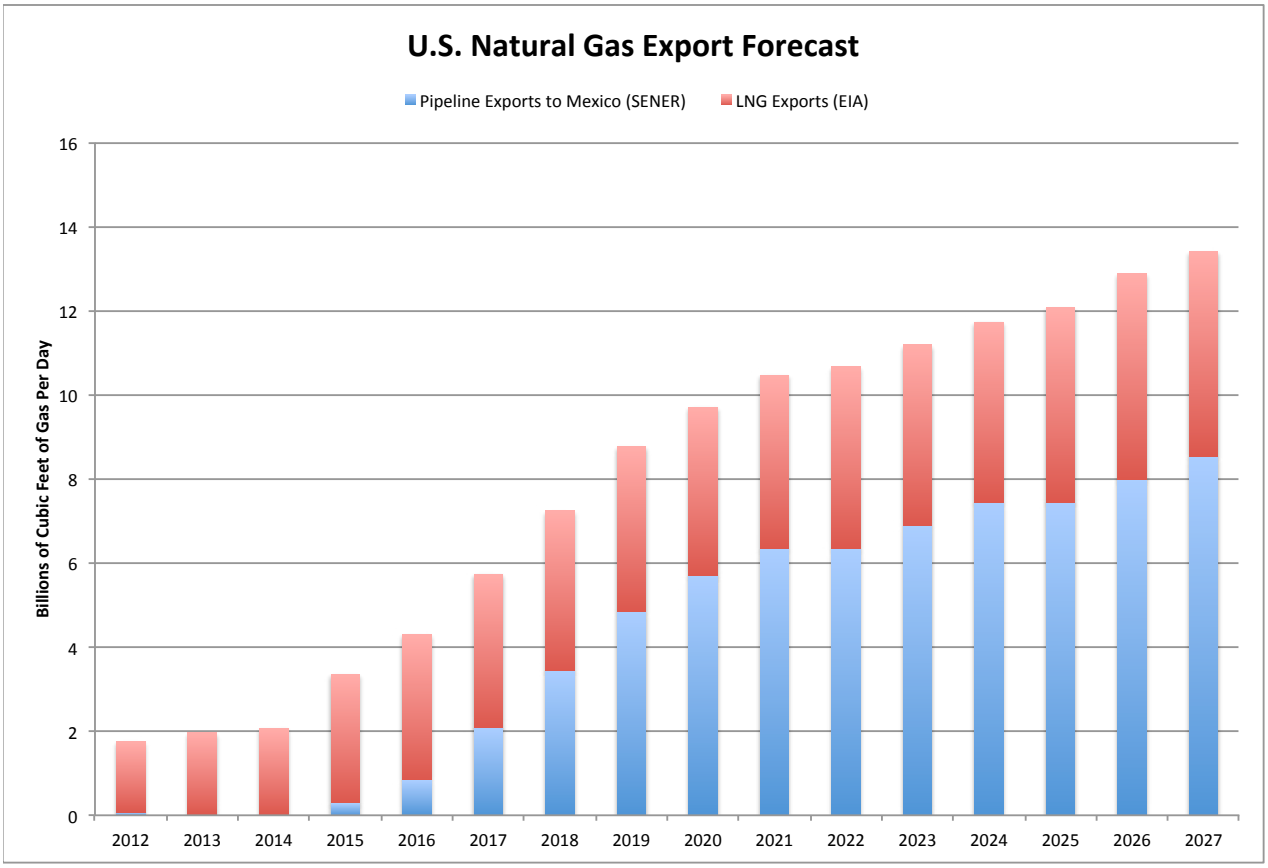
For sponsorship and booth information, call the GSH office 281-741-1624 or visit http://www.gshtx.org

Early registration is open!

HGS North American Dinner continued from page 35



Source: EIA & SENER

estimates but not reserves, production volumes but not the cost of that production, the benefits of technology but not its price, and claims of profit that exclude important expenses. The government and press accept this story because it paints a picture that fulfills so many aspirations of energy independence, U.S. re-emerging political strength dominance in energy affairs and economic growth that warning signs of potential risk have so far been ignored.

Natural gas prices have never recovered from their collapse during the financial crisis in mid-2008. Chronic over-production of non-commercial gas funded by debt has kept prices below the cost of production. The great hope for producers was to export natural gas to higher-priced markets in Asia and Europe. The premise for profitable export of U.S. LNG is continuing low prices and surplus of supply. Sales will only be competitive if domestic prices stay below approximately $4.50/Mmcf. This is unlikely after U.S. production peaks near the end of the decade. Plans to export pipeline gas to Mexico and to replace coal fired- with natural gas-fired electric power generation will further accelerate depletion of reserves and increase price. Recent contracts have been signed to bring conventional gas by pipeline from Central Asia, Russia and the Middle East to the markets of Europe, South Asia and the Far East. The terms of these agreements will force a ceiling price of around $11/Mmcf that will challenge the economics of U.S. LNG export.

The proven reserves of those conventional gas supplies dwarf U.S. reserves even including proven undeveloped shale gas volumes. Iran, Russia, Turkmenistan and Qatar cumulatively have approximately twelve times the proven gas reserves of the U.S., and can produce them at a fraction of the cost of U.S. shale gas. They are also much closer to European and eastern Asian markets. The new pipelines and LNG facilities that will connect the Asian and European markets by the end of this decade, combined with the rising cost of shale gas production in the U.S., will substantially reduce the price divergence between global markets that has existed since 2008. U.S. prices are likely to rise as production peaks. North American LNG export, based on the low U.S. gas prices of the past few years, will be uneconomic and seen in retrospect as ill-conceived and capital destructive.

Shale gas has provided the United States with a decade of supply that was not recognized as recently as 2005. That is a good thing. However, it probably represents a respite in the decline of U.S. gas reserves rather than a fundamental change in energy supply.

HGS North American Dinner *continued on page 39*

The Seapex Exploration Conference

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15 – 17 April 2015

Fairmont Hotel, Singapore

Lunches and Drinks included

Technical Programme*

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Ice Breaker/Golf/Tennis

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Register before 15 January 2015 for the early bird rate of S$900

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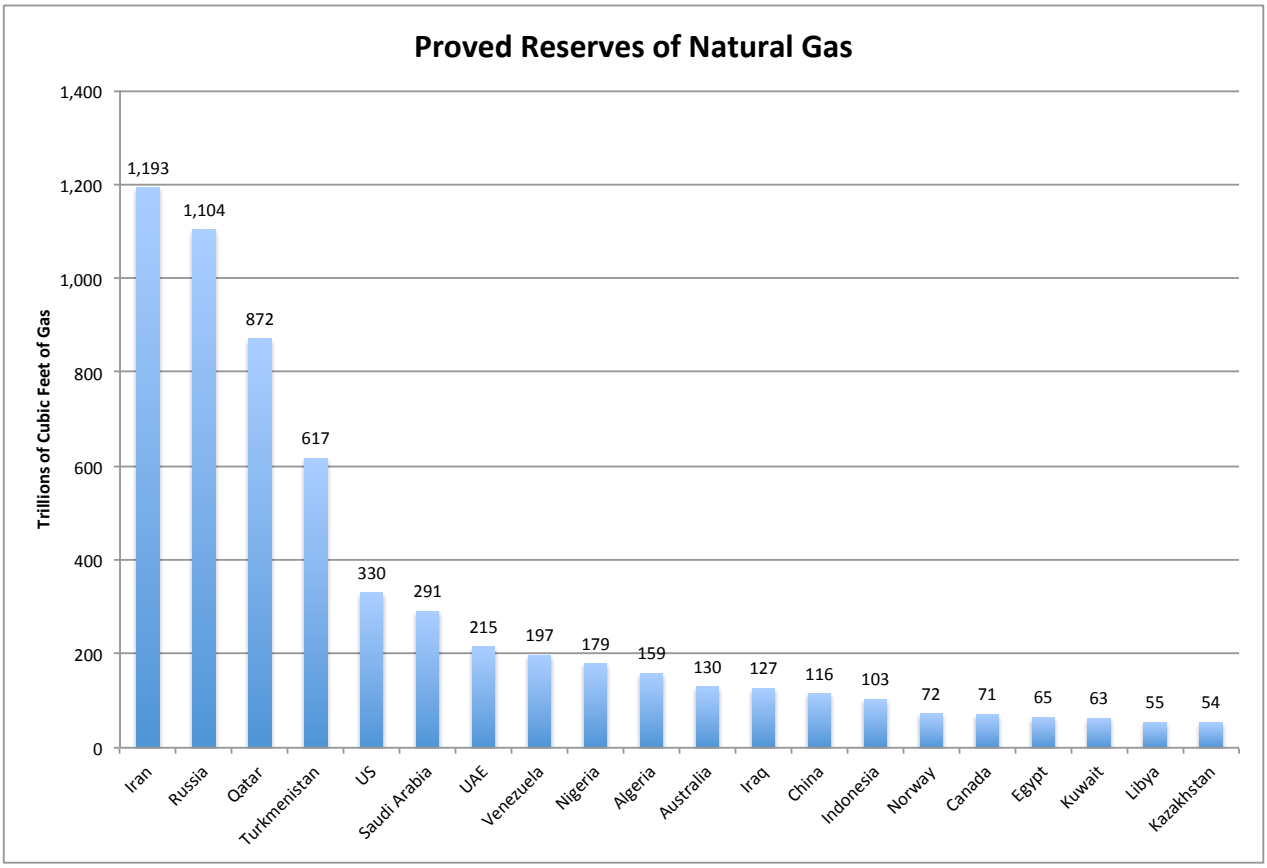
*For talk proposals, please contact **peter.woodroof@petrofac.com or chris.howells@tgs.com.**
See events and register online at **www.seapexconf.org**

HGS North American Dinner continued from page 37



Source: BP

Biographical Sketches

Arthur Berman is a petroleum geologist with 36 years of oil and gas industry experience. He is an expert on U.S. shale plays and is currently consulting for several E&P companies and capital groups in the energy sector. During the past year, he made more than 25 keynote addresses for energy conferences, boards of directors and professional societies. Berman has published more than 100 articles on oil and gas plays and trends. He has been interviewed about oil and gas topics on CBS, CNBC, CNN, Platt's Energy Week, BNN, Bloomberg, Platt's, *The Financial Times, The Wall Street Journal, Rolling Stone* and *The New York Times*. Berman is an associate editor of the *American Association of Petroleum Geologists Bulletin*, and was a managing editor and frequent contributor to theoildrum.com. He is a Director of the Association for the Study of Peak Oil, and has served on the boards of directors of The Houston Geological Society and The Society of Independent Professional Earth Scientists. He is a past-editor of the Houston Geological Society *Bulletin*. He worked 20 years for Amoco (now BP) and 16 years as consulting geologist. He has an M.S. (Geology) from the Colorado School of Mines and a B.A. (History) from Amherst College.

Ray Leonard is the CEO and President of Hyperdynamics, a New York Stock Exchange listed company exploring for deep-water oil and gas in West Africa, a position he has held since July 2009. Leonard worked with Amoco for nineteen years, with initial assignments in Trinidad, Norway, and West Africa. In 1989, he was appointed director of New Ventures for the Soviet Union, Eastern Europe, and China; and in 1994, Vice President for Resource Acquisitions, Amoco Eurasia; He left Amoco in 1998 and has held the following positions: exploration vice president for First International Oil Company (FIOC) in Almaty, Kazakstan; vice president-Exploration and New Ventures in Moscow for YUKOS; senior vice president for International Exploration and Production for MOL, the Hungarian National Oil and Gas Company; and vice president, Eurasia and Exploration for Kuwait Energy Company, the first Arab private oil company. He has been active in the debate regarding world oil and gas reserves for many years, presenting and publishing at international forums. Leonard was born in New York. He received a bachelor of science in Geology from the University of Arizona and a master of arts in Geology from the University of Texas at Austin.

Wednesday, February 25, 2015

Petroleum Club of Houston • 1201 Louisiana (Total building)

Social Hour 11:30 a.m.
Luncheon 12:00 p.m.

Cost: $45 Preregistered members; $50 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.

HGS General Luncheon Meeting

Don Clarke

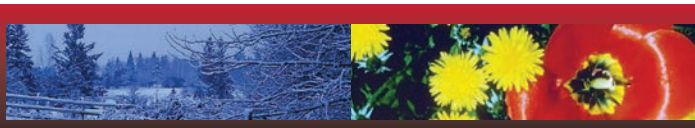
Hydraulic Fracturing and Earthquakes: Ethically, How Do We Move Forward and Do the Right Thing?

In 2010 Senator Bingaman of New Mexico requested that Department of Energy Secretary Steven Chu engage the National Research Council (NRC), the operating arm of the National Academy of Sciences and National Academy of Engineering, to form an ad hoc committee to examine the topic of "Induced Seismicity Potential in Energy Technologies." The committee of eleven members was formed from a large set of nominees sent to the NRC staff from a spectrum of professionals in academia, government, and industry and was approved by the chair of the NRC. The committee members, each of whom served pro bono for the duration of the project, brought a wide range of expertise to the study including oil and gas exploration and production, geothermal energy, drilling engineering, fluid injection, seismic monitoring and modeling, seismic hazard assessment, geomechanics, mining engineering, fluid-rock interaction, and regulatory oversight, with professional experience derived from academic research, private industry, and government service. During the course of a year, the committee convened five public information-gathering meetings and produced a consensus report that assessed the current situation related to induced seismicity in the United States for various energy technologies including hazards, risks, government roles and responsibilities, proposed research needs and suggestions on how to move forward. The report stands as an example of how a group of objective professionals with varying viewpoints can come to a consensus and produce a useful, scientifically-grounded document to help guide developments with emerging energy technologies. See more at: http://www.aapg.org/career/training/in-person/distinguished-lecturer/abstract/articleid/3075/hydraulic-fracturing-and-earthquakes-ethically-how-do-we-move-forward-and-do-the-right-thing#sthash.oTotdhIi.dpuf. ■

Biographical Sketch

Don Clarke is a consulting petroleum geologist in Lakewood, California. Don got a BS degree in Geology from California State University, Northridge and did two years of graduate work at CSUN, LBSU and CSULA. He worked for the California State Lands Commission for 6 ½ years and the City of Long Beach, Department of Oil Properties (Unit Operator for the supergiant Wilmington oil field) for 24 years. He taught geology at Compton Community College for 14 years and currently teaches petroleum geology at the University of Southern California. Currently Don does consulting work for clients that include Occidental Petroleum, Signal Hill Petroleum, City of Beverly Hills, City of Newport Beach, City of Hermosa Beach and Terralog Technologies. He has published over 60 papers and abstracts on topics that include computer mapping and Los Angeles basin geology. He has conducted many field trips and short courses for AAPG, PSAAPG, SPE and GSA. Don has appeared as a petroleum geology expert in the Swiss movie "A Crude Awakening", the National Geographic series "Man Made" episode "Gallon of Gas", the History Channel series "Trashopolis" episode 9 "Los Angeles" and VBSTV episode "Los Angeles" Hidden Wells". Don has served AAPG as the Chairman of the House of Delegates, on the Advisory Council and on many committees. He is a past president of Pacific Section AAPG and has chaired and co-chaired conventions for PSAAPG, Cordilleran Section GSA and Western Region SPE.

February 2015



Sunday	Monday	Tuesday	Wednesday
1	2	3 **HGS Board Meeting** *6 p.m.*	4
8	9 **HGS General Dinner Meeting** *"Anthropogenic Climate Change – A Growing Awareness in the Oil and Gas Industry," Dr. Barry Lefer and Dr. James M. Rine, Page 17*	10	11 **HGS Environmental & Engineering Dinner Meeting** *"TBPG Ethics Presentation," T. Wesley McCoy, Page 27*
15	16 **HGS International Dinner Meeting** *"Exploring for Turonian Reservoirs within the Paleo-Assinie Fairway, Offshore Côte d'Ivoire as seen in the Albacore-1X and Capitaine East-1X Exploration Wells; De-risking with better Seismic Data and Geologic Models," Richard S. Dow, Page 29*	17 **HGS Applied Geoscience Conference** *Integrated Approaches of Unconventional Reservoirs Assessment and Optimization The Westin Houston, Memorial City Page 12*	18
22	23 **HGS North American Dinner Meeting** *"Years Not Decades: Proven Reserves and the Shale Revolution," Arthur Berman and Ray Leonard, Page 35*	24	25 **HGS General Luncheon Meeting** *"Hydraulic Fracturing and Earthquakes: Ethically, How Do We Move Forward and Do the Right Thing?," Don Clarke, Page 41*

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 reservations@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	$45
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Except - Env. & Eng.	$30
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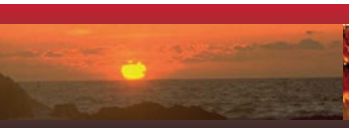

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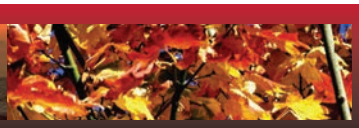

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12	13	14
19	20	21
26	27	28

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September 20-22, 2015
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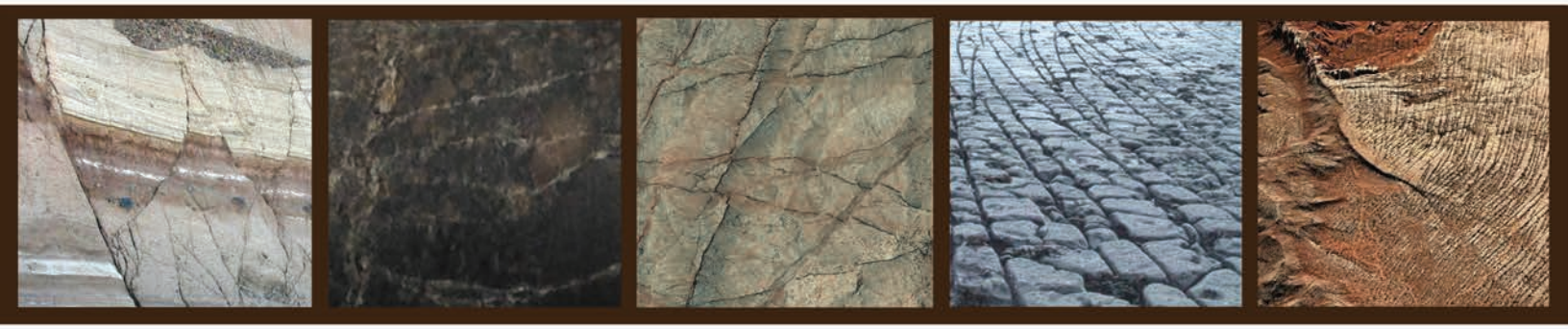

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Remembrance

Robert Edward Sheriff

1922-2014

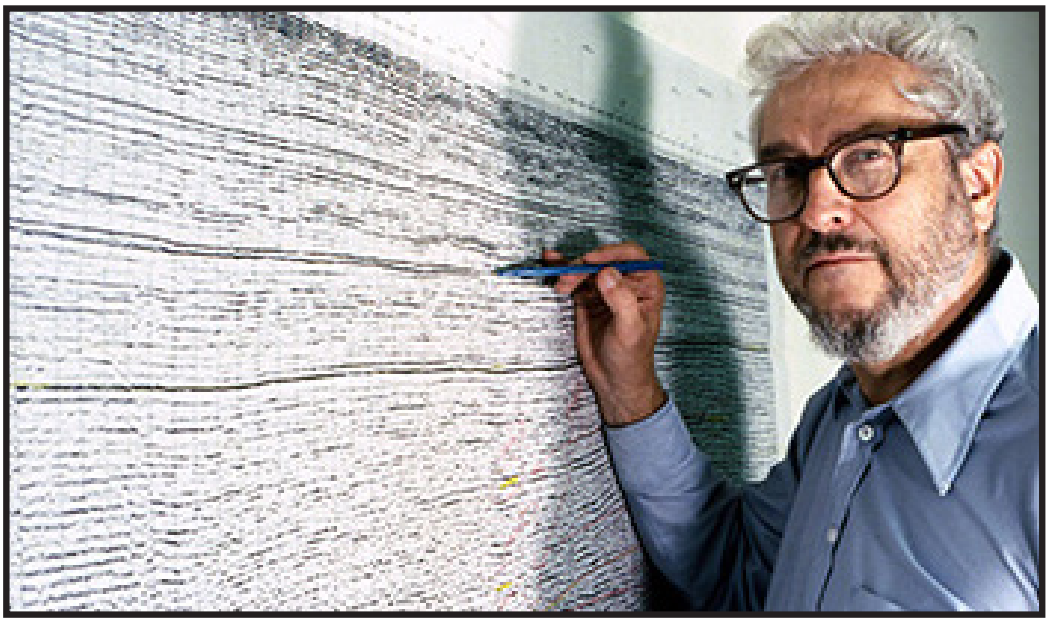

Photo courtesy Robert Sheriff Collection

Dr. Robert E. (Bob) Sheriff passed peacefully at his home in Missouri City, Texas on November 19, 2014. Bob was born in Mansfield, Ohio on April 19, 1922, to Rev. Charles and Marjorie Sheriff. He graduated from Wittenberg College in 1943 with a BS in Chemistry before attending Ohio State University for graduate work. In 1943, Bob was recruited for the famous WWII "Manhattan Project" in Oak Ridge, Tennessee and worked there until the end of the war on uranium isotope separation. In Oak Ridge he met Margaret M. Sites, another Project employee, and they married in 1945. Bob received his MS in Physics in 1947 and PhD in Physics in 1950 from Ohio State University and then accepted an offer from Standard of California (Chevron) to work in their new geophysical research lab. Bob worked for Chevron in a variety of geophysical and managerial positions around the world for the next 25 years.

After retiring from Chevron in 1975, Bob served 5 years as Senior VP of Development with Seiscom-Delta before joining the faculty at the University of Houston as a fully tenured Professor of Geophysics. His main interests were seismic detailing of reservoirs, 3-D seismic interpretation and seismic stratigraphy. In 2003, Bob retired as Professor Emeritus from the University of Houston with over 23 years teaching geophysics.

Bob & Margaret took an interest in the bright young minds they met overseas and endowed several SEG Scholarships for international students wishing to continue their studies in geophysics at the University in Houston. Bob & Margaret believed strongly in the value of education and established the endowed Faculty Chair in Applied Seismology, an endowment in Applied Geophysics, an endowed Professorship in Sequence Stratigraphy and an endowed Professorship in Geophysics at the College of Natural Sciences and Mathematics of the University of Houston.

Bob is renowned for his numerous publications, including a number of classic geophysical textbooks. In 1969, Bob received the SEG Virgil Kauffman Medal for his initial publication of the *Encyclopedic Dictionary of Exploration Geophysics.* Bob was an active member of the SEG, EAGE, GSH and HGS. He served as First Vice President of SEG from 1972-73 and also served on numerous SEG committees through the years. Along with dozens of other industry and educational awards over the years, Bob was honored in 1998 with SEG's highest award, the Maurice Ewing Award, for his lifetime achievements in geophysics.

Donations in Bob's memory may be made to the Robert & Margaret Sheriff Endowment in Applied Geophysics online at https://giving.uh.edu/nsm, or by mail to University of Houston, 214 Science and Research II, Houston, Texas, 77204-5008. Contact Janis Parsley at 713-743-8375 or parsleyj@uh.edu for more information. ■

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AAPG Education

Remembrance

William F. Bishop

1932-2014

William F. (Bill) Bishop died December 4, 2014 at his home in North Carolina. He was born November 30, 1932 in Findlay, Ohio to Darl and Gertrude Bishop. He received an A.B. degree in Geology in 1954 from Miami University, Oxford, Ohio where he was a member of Delta Upsilon Fraternity and was Phi Beta Kappa. After he served in the U.S. Army Corps of Engineers for 2 years, he returned to Miami and received an M.A. degree in Geology in 1957.

Bishop's major company experience included 10 years in domestic exploration with Marathon and Tenneco, 2 years in Canada and 16 years with international exploration for Ashland. He became an international consultant in 1986. The next year he worked as a subcontractor to Robertson Research International and was the principle author of a report entitled "Petroleum Geology and Hydrocarbon Potential of Iraq." Subsequently, he performed basin studies and prospect evaluation in Algeria, Tunisia, Morocco, Angola, Turkey, Iraq and Malta.

He was a prolific author, publishing 14 papers on a variety of subjects. In recognition of the quality of his papers, several were republished in the AAPG and one in Foreign Reprint Series 1. His publication efforts have benefited geologists worldwide.

Bill was also active in professional affairs. He was an AAPG delegate and active in the Houston Geological Society in various capacities, including President during 1981-82. For his many innovations and contributions he was awarded the Distinguished Service Award in 1989.

For many years, Bill and Julia also lived at their home Broomfields at Round Top, TX where they were engaged in the activities at Winedale, the Round Top Antique Show and the music at Festival Hill.

He is survived by his wife of 57 years, Julia Evans Bishop and their 3 children: William Sanford Bishop, NC; Sarah Evans Ninaud, Austin, TX; and John Nicholas Bishop, Fredericksburg, TX. Bill and Julia have resided in North Carolina since 1999.

Donations in Bill's memory may be made to: Ashe Humane Society, P.O. Box 1776, West Jefferson, NC 28694 or Medihome Health & Hospice, P.O. Box 421. Jefferson, NC 28640. ■

Should you hear of a fellow HGS member's or contributor's passing, please send information to the Editor-Elect at jonblickwede@gmail.com.

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.

AGI Geoscience Policy Monthly Review (October 2014)

Leadership Changes in the 114th Congress

Midterm congressional elections held on Tuesday, November 4, 2014 resulted in a number of committee leadership changes for both Democrats and Republicans. The incoming Senate, which previously held a Democratic majority, will be controlled by Republicans, and the Republicans also increased their majority in the House of Representatives. The new majority within the Senate means that across the board changes to committee leadership are imminent in the 114th Congress.

Senate Energy and Natural Resources Committee (ENR): Sen. Lisa Murkowski (R-AK) will replace Sen. Mary Landrieu (D-LA) as chair of ENR. Sen. Landrieu lost her bid for reelection in a December 6, 2014 runoff against Rep. Bill Cassidy (R-LA). Consequently, Sen. Maria Cantwell (D-WA) is expected to replace Sen. Landrieu as ranking member of the committee.

Senate Commerce, Science, and Transportation Committee (CST): Sen. Ted Cruz (R-TX) is expected to take over the chairmanship from Sen. Bill Nelson (D-FL) for the Science and Space Subcommittee within CST. The Space and Science Subcommittee oversees federal science research funding. Sen. John Thune (R-SD) will take over from Sen. Jay Rockefeller (D-WV) as chair of the full CST committee.

Senate Environment and Public Works Committee (EPW): Sen. James Inhofe (R-OK) is likely to transition from ranking member of EPW to chair of the full committee. Former chair Sen. Barbara Boxer (D-CA) is expected to stay on the committee as ranking member.

Senate Appropriations Committee: Sen. Thad Cochran (R-MS) will likely take over as chair of the Senate Appropriations Committee in the 114th Congress. Current Ranking Member Sen. Richard Shelby (R-AL) is expected to transition to the Senate Banking Committee. Former Appropriations Chair Sen. Barbara Mikulski (D-MD) will transition to Ranking Member of the committee.

House Natural Resources Committee: Rep. Doc Hastings (R-WA), Chair of the House Natural Resources Committee, will retire at the end of the 113th Congress, leaving a key vacancy for Republicans. Additionally, Ranking Member Peter DeFazio (D-OR) is expected to relinquish his role on the Natural Resources Committee in favor of the ranking member position on the Transportation and Infrastructure Committee. Rep. Rob Bishop (R-UT) will take over from Rep. Hastings, and Rep. Raúl Grijalva (D-AZ) will take over from Rep. DeFazio.

House Passes Three Bills Concerning EPA Science and Regulations

The House passed three bills the week of November 17, 2014 regarding the science that the Environmental Protection Agency (EPA) uses to issue environmental regulations. The bills attempt to change how EPA reviews scientific data and how it issues permits.

The first piece of legislation, H.R. 1422, concerns EPA's Science Advisory Board. The bill would mandate a quota to increase the number of state and local officials on the board, allow members of industry to serve if they disclose financial conflicts of interests, and limit participation by academics who have previously received EPA funding. Critics object that the measure would prohibit the most knowledgeable researchers from serving on the board and increase the role of corporate interests, hampering the board's ability to perform its intended role. Proponents argue that the legislation is necessary to adjust biases in the board's current makeup.

The second bill, H.R. 4012, is aimed at the "secret science" behind current EPA regulations. It stipulates that all data the agency uses to inform its policies must be publicly available in reproducible form. The bill's supporters contend that this will increase transparency in EPA regulation. However, many within the scientific community and some Democrats object strongly because peer-reviewed studies often use confidential health information that cannot be released without violating federal law. Critics also argue that this legislation would prohibit the EPA from using the best available science, undermining its ability to effectively regulate.

The third measure, H.R. 4795, is designed to expedite the permitting process for new industrial facilities by exempting companies from abiding by new National Ambient Air Quality Standards if final regulations and implementation guidelines are not issued concurrently with the standard.

Government Update *continued on page 53*

The University of Texas at Austin
Research Position in Clastic Sedimentology

The Bureau of Economic Geology, Jackson School of Geosciences at The University of Texas in Austin invites applicants for a full time research position in clastic sedimentology and stratigraphy. We seek an experienced candidate to conduct cutting edge research and lead the Quantitative Clastics Laboratory (QCL), a consortium-funded research group focused on the description, analysis, and quantification (morphometrics) of clastic depositional systems that are potential reservoir analogues.

This is a senior-level position. Requirements include a PhD in geology or closely related field, five to ten years of post-PhD experience, a strong record of publishing, evidence of successful leadership, as well as the ability to acquire and retain industry sponsors.

The candidate's research focus could include, but would not be limited to, source-to-sink dynamics, process sedimentology, evolution of complex continental margin settings, basin analysis, sequence stratigraphy, and application of seismic geomorphology to reservoir characterization. The candidate should be motivated to work with colleagues in developing improved understanding of scaling issues from the core to seismic level, including the roles of outcrop description and physical modeling. A strong desire and ability to successfully sponsor PhD and Master's level students is also highly valued.

Success in this position requires a desire to lead a small team, and to craft a long-term vision that will result in growing and sustaining the QCL. Abundant opportunities exist for collaborating with industry researchers, interacting with other researchers and faculty of the Jackson School, advising graduate students, and acquiring or sharing laboratory and field equipment.

Preference will be given to candidates with deepwater clastics systems expertise, and those who have an appreciation of energy industry needs and challenges.

The Bureau of Economic Geology, with a staff of 250 including approximately 60 graduate student research assistants, is the oldest research unit of The University of Texas at Austin. The Bureau hosts ten research consortia, strongly supported by industry. We enjoy outstanding IT resources and support. The Bureau has a diverse workforce, extensive laboratory facilities, and operates the largest rock-core collection in the U.S. (~1500 miles of core). The Jackson School of Geosciences is highly ranked and is the largest U.S. geoscience program. Austin is a thriving city of about 1 million, renowned for live music and Texas Hill Country ambiance.

Candidates can apply at the Research Scientist or the Senior Research Scientist level, depending upon qualifications. Go to https://utdirect.utexas.edu/apps/hr/jobs/nlogon/search/0/ for complete description and to apply for posting number 141111010702 (Research Scientist) or 141111010701 (Senior Research Scientist).

The University of Texas at Austin is an equal employment opportunity/affirmative action employer. All positions are security sensitive, and conviction verification is conducted on applicants selected.

BUREAU OF ECONOMIC GEOLOGY

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Government Update continued from page 51

The White House has threatened to veto these three bills if they pass the Senate and go to the President for signature.

U.S. Signs Climate Change Agreement with China

On November 12, 2014 President Obama and Chinese President Xi Jinping signed a climate change agreement, pledging to cut greenhouse gas emissions and collaborate in an international effort to combat global temperature rise.

Under the agreement, China pledged to reach peak emissions by 2030 at the latest, before reductions come into effect. It will also transition 20 percent of its energy share to non-fossil fuel sources in the same time period by investing in nuclear, wind, solar, and other zero carbon emission energy technologies. The United States pledges to reduce such emissions by 26 to 28 percent below 2005 levels by 2025, with the ultimate goal of an 80 percent cut in those emissions by midcentury.

Critics of the deal have expressed concern that the agreement is disproportionate, with more stringent, potentially economically-prohibitive requirements for the U.S., while China has 16 years before emission cuts come into effect. Critics also argue that the deal is not a binding agreement and includes no enforcement mechanisms.

President Obama and other supporters of the deal hope that an agreement between the world's two largest economies will set a precedent for future international collaboration on efforts to curb global climate change. The breakthrough was hailed as a positive precursor for the U.N. Climate Change Conference in Lima, Peru in December.

IPCC Releases Report Warning of Consequences of Climate Change

The Intergovernmental Panel on Climate Change (IPCC) released a report on November 3, 2014 that synthesizes its published findings on climate change over the last 13 months. The report summarizes observed and predicted changes to the climate, the risks and impacts of these changes, and strategies for adaptation and mitigation for policy makers. The IPCC is a scientific organization set up by the U.N. that produces reports summarizing the most current science on climate change and its socioeconomic impacts.

The authors warn of "severe, pervasive, and irreversible impacts for people and ecosystems" if greenhouse gas emissions continue at present rates. However, they also suggest that these risks may be mitigated if emissions can be reduced by 40 to 70 percent by 2050 compared to 2010 levels, and if we can cease emission of carbon dioxide from electricity, transportation, industry, and residential and commercial sectors by 2100.

Recent international climate negotiations have stalled over disagreements on whether to emphasize emissions reductions or adaptation strategies, but the IPCC report issues a strong statement that both are necessary: "Adaptation can reduce the risks of climate change impacts, but there are limits to its effectiveness, particularly if greenhouse gas emissions are not reduced."

Nature Study Recommends New Approach to Wildfire Management

A new study in the journal *Nature* suggests that wildfires be treated like other natural disasters, such as earthquakes or floods, where officials focus on adaptation and loss mitigation as opposed to prevention and response. The federal government currently spends billions of dollars each year fighting and controlling wildfires; up to half of that expense is spent defending homes and structures built in fire-prone areas. Development in these areas has increased since this strategy was implemented because the federal government has demonstrated its willingness to protect public and private structures in these areas.

The study's authors, who are from the U.S., Australia, and Spain, suggest reframing wildfire mitigation as a land-use issue. In the same way that building codes and insurance policies are tailored for structures in earthquake-prone areas, the authors recommend the government incentivize building "fire-wise" homes in less hazardous areas. In extreme cases, development could even be restricted. The study states that these kinds of changes could decrease fire suppression costs and property loss, as well as encourage healthier ecosystems. Without structures to protect, wildfires could selectively be allowed to burn, maintaining forests' biodiversity and natural processes.

House Subcommittee Holds Oversight Hearing on Volcanic Hazards

On November 19, 2014 the Energy and Mineral Resources Subcommittee of the House Natural Resources Committee held an oversight hearing on U.S. preparedness for and response to volcanic hazards. The hearing was particularly timely because of the ongoing Kilauea eruption in Hawaii that threatens the town of Pahoa and has already claimed one house. Multiple witnesses and Members of Congress present have ties to Hawaii, including Darryl Oliviera, the director of Hawaii County Civil Defense, Gordon Ito, the Hawaii State Insurance Commissioner, and Representatives Colleen Hanabusa (D-HI), and Rep. Tulsi Gabbard (D-HI).

Witnesses testified to the importance of the U.S. Geological Survey's (USGS) Volcanic Hazards Program (VHP) for monitoring hazardous volcanoes and responding to eruptions.

Government Update *continued on page 55*

HGS Welcomes New Members

New Members Effective December 2014

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Musa Ibrahim Atekpa
Keling Chen
Campbell Craig
Jacob Fastner
Brian Kubik
Lucien Nana Yobo
Lourdes Rodriguez
Samuel Smith
Justin Wendt

Welcome New Members

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However, Charles Mandeville, the VHP program coordinator, emphasized the high cost of these activities relative to its budget; only 30 percent of hazardous volcanoes are currently monitored, and at current funding levels, it could take 20 years to complete the monitoring network.

Witnesses also addressed the role of other federal agencies, particularly the Federal Emergency Management Agency (FEMA), in responding to active eruptions. In Pahoa's case, federal assistance has helped efforts to protect infrastructure and maintain road access for citizens, as well as ensuring access to education and healthcare services. The panel agreed on the importance of the federal government's participation in these efforts, because state and local agencies would likely not be able to fulfill these functions on their own.

Senate Energy and Natural Resources Committee Holds Markup on Energy, Parks, and Lands Bills

On November 13, 2014 the Senate Energy and Natural Resources Committee held a markup of 16 bills pertaining to energy, parks, and public lands. Of the 16 bills, 12 were passed out of committee by a voice vote, addressing wilderness designations, grazing management issues, and historic site protections. Four bills underwent further discussion before passing, three by roll call vote and one by voice vote.

The National Park Access Act (S. 2104) would authorize the National Park Service (NPS) to reimburse states for money spent keeping parks and forests open during the 2013 government shutdown, and it was passed by a voice vote. A related bill, the Public Access to Public Land Guarantee Act (S. 1750), would institute a standing agreement for continued operation of parks and forests in the case of future shutdowns. Despite reservations expressed by several Democrats, the bill narrowly passed by a roll call vote of 12-10.

These bills have been recognized as examples of effective bipartisan compromise, balancing the interests of conservationists with those of ranchers, loggers, and other public lands stakeholders.

U.S. Water Use at Lowest Levels Since 1970

According to a new U.S. Geological Survey (USGS) report, U.S. water usage has declined to its lowest level in the past 45 years. Despite major growth in the U.S. population and economy since 1970, water use has remained relatively stable and decreased significantly only between 2005 and 2010. The report measures water withdrawal, which includes any removal of water from natural sources including groundwater, surface water, and salt water, even if it is returned to waterways after use.

Power plants use the most water, at 45 percent of total U.S. withdrawals for many years, but efficiency improvements decreased usage by 20 percent from 2005 to 2010. Irrigation, the second-highest category at 33 percent of total withdrawals, has declined 9 percent over the same period. Only two categories, mining and aquaculture, increased their water use, but these account for just four percent of total withdrawals and do not offset gains from other sectors.

The report attributed the decreases in water use to many factors, including more efficient systems and technology, stronger environmental regulations, and limited water resources. The Deputy Secretary of the Interior praised these developments in a statement, drawing a contrast between the growing U.S. population over the last 45 years and steadily declining water use.

Army Corps of Engineers Considers Shift Toward Watershed-Based Planning

In a press conference held on November 14, 2014 to discuss their climate adaptation plan, the U.S. Army Corps of Engineers (the Corps) discussed the possibility of an agency-wide shift toward holistic watershed management. Currently many projects have operating rules based on their original intent, such as hydropower or water storage, that can complicate decision-making in times of flood or drought. For example, a 2012 drought in the Mississippi basin lowered water levels so far as to threaten barges' ability to transport goods along the river. However, navigability was not the original purpose for the reservoirs in question, so the Corps was unable to take the steps necessary to fill them, instead choosing to dynamite riverbed obstacles in order to maintain shipping traffic. Officials explained that a broader, watershed-based planning strategy would avoid conundrums like these by allowing the Corps to manage many individual projects as a single system, minimizing conflicts and incorporating wider community planning and ecological goals. ■

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 hardcopy 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 jill@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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7	$665	$1,123	$2,014	$3,834						
6	$590	$990	$1,782	$3,392						$1,890
5	$497	$837	$1,503	$2,860	$4,698	$4,536	$4,466	$4,104		
4	$405	$683	$1,223	$2,326						
3	$327	$550	$990	$1,886						$1,080
2	$232	$392	$704	$1,339						
1	$146	$246	$443	$842	$1,404	$1,296	$1,313	$1,080	$1,296	$810
Professional Directory Section Business Card Ad 10 Issues – $160 ($30 for each additional name on same card)										

Website Advertising Opportunities

HGS has multiple website advertising opportunities for your company! We've expanded our offerings to include a 275 x 800 pixel, rotating banner ad on the front page of the website. We have kept the popular Event Calendar and Geo-Job Postings advertisement locations!

	Home page Banner	**Home Page (200 x 400 pixels)**	**Event Calendar (200 x 400 pixels)**	**Geo-Jobs (120 x 90 pixels)**	**Website Business Card (Members Only)**	**Personal Resumes (Members Only)**
One year	$3,000.00	$2,800.00	$2,500.00	$1,400.00	Free	Free
6 months	$2,000.00	$1,800.00	$1,500.00	$750.00	Free	Free
3 months	$1,500.00	$1,300.00	$1,000.00	$450.00	Free	Free
Monthly	$ 700.00	$500.00	$ 400.00	$200.00	Free	Free

We still offer Geo-Jobs - where your company can post job openings for 14 days at $50.00 or 30 days at $100.00.

For more information regarding website advertising visit HGS.org or email jill@hgs.org.

Application to Become a Member of the Houston Geological Society

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.
2) Be a full-time student enrolled in geology or in the related sciences.

Apply online at www.hgs.org and click on Join HGS

Annual Dues Expire Each June 30. (Late renewals – $5 re-instatement fee)
Annual dues are $28.00; emeritus members pay $14.00; students are free.

Mail this application and payment to:
Houston Geological Society
14811 St. Mary's Lane, Suite 250 • Houston, TX 77079-2916
Telephone: 713-463-9476 Fax: 281-679-5504

Payment method:

☐ Check, ☐ VISA, ☐ MasterCard, ☐ American Express, ☐ Discover

Card # _____

Expiration Date: _____ Card I.D. _____

(Card I.D. – 3 or 4 digit number on front or back of card)

To the Executive Board: I hereby apply for ❑ Active or ❑ Associate membership in the Houston Geological Society and pledge to abide by its Constitution and Bylaws. ❑ Check here if a full-time student.

Name: _____

Address: _____

_____

Home Phone: _____ *Spouse's Name:* _____

Email: _____

Job Title: _____

Company: _____

Company Address: _____

_____

Work Phone: _____ *Fax Number:* _____

Circle Preferred Mailing Address: Home Office

Professional Affiliations: _____

❑ AAPG member No.: _____

Professional Interest:

❑ Environmental Geology
❑ International E&P
❑ North American E&P (other than Gulf Coast)
❑ Gulf Coast E&P (onshore & offshore)

School _____

Degree _____ *Major* _____ *Year* _____

_____

School _____

Degree _____ *Major* _____ *Year* _____

Earth Science Work Experience _____

_____

_____

_____

Applicant's Signature _____ *Date* _____

Endorsement by HGS member (not required if active AAPG member)

Name: _____

Signature _____ *Date* _____

Membership Chairman _____ *HGS Secretary* _____

revised 7/30/14

Houston Petroleum Auxiliary Council News

Janet Steinmetz, *281-531-7204*

ATTENTION ALL HUSBANDS! Please share this article with your wife. Spouses of geologists, geophysicists, landmen and engineers are invited to join HPAC, an organization designed especially for you.

The ladies of HPAC hope you will participate in all the fun events we have planned. We begin this month with a meeting of the **Book Club**. The discussion of Jennifer Chiaverini's book *Mrs. Lincoln's Dressmaker* will, without a doubt, be lively and informative. If you're reading this just before February 2, you can still attend, or if you are interested in future meetings, call Mickey Murrell at 281-460-2272. In May we will discuss Donna Tartt's new novel *The Goldfinch*. It's a very long book; so you might want to start reading it now.

Exploring Houston will be leading a *Tour of The Third Ward* on February 19, 2015. Read on for all the details. It looks like another winner - not to be missed!

Early Houston was divided into Wards instead of Council Districts and we are going to explore one of the wards. The Third Ward was delineated by Main Street on the west, Congress Avenue on the north, Braes Bayou on the South and the B and O RR on the East (now I-45). Most of us have been to Hermann Park on the west side and to the UH campus on the east but have not explored other parts. Now is your chance.

We will begin our tour at a building designed in 1925 by Albert Finn, Jessie Jones' Architect, as the armory for the local militia. It is now owned by HCC and houses the Buffalo Soldiers National Museum. Then on south on Caroline to Museum of African American Culture and a special exhibit there. Lunch will be at Lucille's. Chef Williams will serve a sampler plate of some of his grandmother's recipes.

After lunch we will travel to TSU and visit the first building on campus which is now a museum featuring art projects of the faculty and students in the Fine Arts Department. Next is Project Row Houses which have been featured in the media recently. We will also drive past some of the other places we hear and read about such as Wheeler Avenue Baptist Church and Emancipation Park.

Meet at the parking lot of Memorial Drive Presbyterian church at 8:45 for prompt departure at 9:00. Send a check for $35 (lunch and museum entrance fees) made payable to HPAC to Martha Lou Broussard, 3361 Bellefontaine, Houston, 77025 by February 14. Guests are welcome.

This month both **Bridge Groups** will resume. **Cinco Más** meets at the Westchase Marriott on February 12; call Audrey Tompkins at 713-686-0005. To join the **Petroleum Club Group** at the new Petroleum Club location call Daisy Wood at 832-581-3132.

Be sure to mark your calendar for the upcoming events. March 17 is **Game Day** at Braeburn Country Club. We can be sure **Daisy Wood** and her committee will have plenty of surprises for us, and we can expect a great party. It is up to you which game you want to play. There are plenty of choices, or you may get your own group together and also have a delicious lunch.

Our Spring Style Show and Luncheon will be on May 14 at Maggiano's Little Italy Restaurant on Post Oak. Fashions will be furnished by "It's All About You". There will also be a brief business meeting and election of officers for next year. You'll be hearing more about these events.

We look forward to seeing you at all these events. If you're not a member and should wish to join, please fill out the attached membership form and send it to **Susan Bell** with a check for $20. ■

You are invited to become a member of

HPAC

2014–2015 dues are $20.00 Mail dues payment along with the completed information

to **Susan Bell** • 11431 Legend Manor • Houston, Texas 77082

YEARBOOK INFORMATION

Last Name	First Name	Name Tag
Spouse Name	Company	
Street Address	City State	Zip
Email Address	Home Fax	
Home Phone	Cell Phone (Optional)	Home Email Address

Please choose a committee assignment if you are interested.

☐ Fall Event ☐ Yearbook ☐ Bridge ☐ Membership

☐ Christmas Event ☐ Spring Event ☐ Notification ☐ Book Club

☐ Exploring Houston ☐ Courtesy

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