HGS Bulletin
Houston Geological Society
Volume 60, Number 4
December 2017

Greece: Onshore and Offshore New Ventures

Page 11

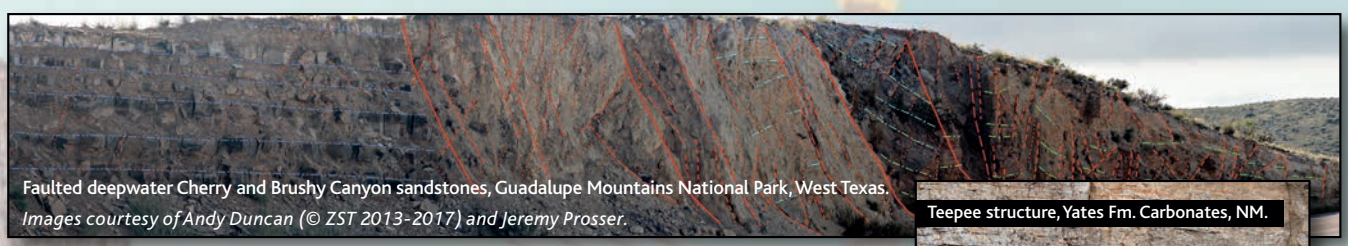
Geochemical Assessment and Characterization of Petroleum Source Rocks and Oils, and Petroleum Systems, Permian Basin, U.S.

Page 14

Particularly Unconventional

THE PERMIAN BASIN - NOT SIMPLY UNCONVENTIONAL

...and not simply one basin, but a complex mix of reservoir types, litho types, depositional and structural settings

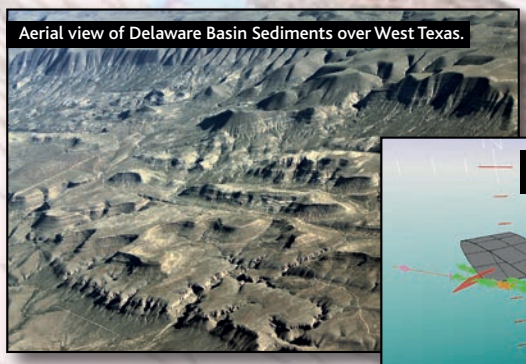


Faulted deepwater Cherry and Brushy Canyon sandstones, Guadalupe Mountains National Park, West Texas.
Images courtesy of Andy Duncan (© ZST 2013-2017) and Jeremy Prosser.

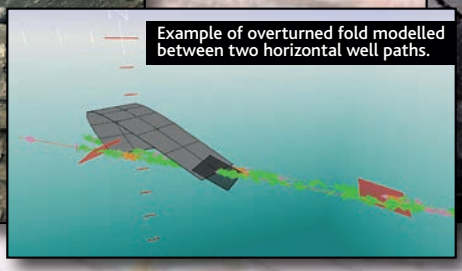
Teepee structure, Yates Fm. Carbonates, NM.

- **Task Fronterra** has subject matter expertise in all major structural and depositional systems
- **Task Fronterra** has vast experience from > 600 wellbores in 16 Counties of the Delaware and Midland Basins, and the Central Basin Platform
- Specialists in the processing and interpretation of all types of image tools using Techlog™, Geolog™ and Terrastation™ software
- Complex structural analysis from multiple wellbores using our ***attitude*** software; with these wellbore visualisation and analysis tools, we can help you to avoid Train Wrecks in well planning with predictive models and help provide solutions to the Head Scratchers.

Cored mudrock reservoir material showing subvertical fracture with slickenside indicating lateral shear *(above)*, and polished surface indicating associated bedding-parallel shear *(left)*.



Aerial view of Delaware Basin Sediments over West Texas.



Example of overturned fold modelled between two horizontal well paths.

VAST EXPERIENCE IN CONVENTIONAL AND NON-CONVENTIONAL RESERVOIRS

Permian Basin Expertise and Services from...

A GLOBAL FOOTPRINT WITH OFFICES IN LOCATIONS IN EUROPE, NORTH AMERICA AND ASIA PACIFIC. COMPLIMENTARY EXPERTISE TO ASSIST CLIENTS IN THEIR UNDERSTANDING OF MATURE RESERVOIRS, CARBONATES, DEEP-WATER FIELDS AND UNCONVENTIONAL HYDROCARBONS.

TASK Fronterra Geoscience

www.taskfronterra.com info_us@taskfronterra.com

HOUSTON +1 713 634 0777 • ABERDEEN +44 1224 357 254 • PERTH +61 8 6110 2082

The Bulletin
Houston Geological Society
Volume 60, Number 4 December 2017

In Every Issue

The Houston Geological Society Bulletin (ISSN-018-6686) is published monthly except for July and August by the Houston Geological Society, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916. Phone: 713-463-9476; fax: 281-679-5504

Editorial correspondence and material submitted for publication should be addressed to the Editor, Houston Geological Society Bulletin, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916 or to Brian.Horn@iongeo.com .

Subscriptions: Subscription to a digital version of this publication is included in the membership dues ($30.00 annually). The subscription price for non-members is $160.00. The printed Bulletin for 10 issues for HGS members is $150.00 or $15.00 per issue while supplies last. Periodicals postage paid in Houston, Texas.

POSTMASTER: Send address changes to Houston Geological Society Bulletin, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916

Technical Meetings

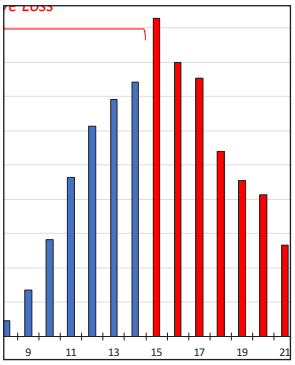
Other Features

About the Cover: Evening shadows over Greenland. Photo by Brian W. Horn

HGS Applied Geoscience Conference

page 4, 8-9

page 11



page 14

page 26

Second Announcement and Call for Papers

Big Continent - Big Ideas - Big Opportunity

Strategies for Success

The 17th HGS-PESGB Conference on African E&P

September 11-12, 2018 • Houston Texas

This annual conference, alternating between Houston and London, has established itself as the primary technical E & P conference on Africa with attendances in recent years exceeding 300, including industry operators, consultants, governments, and academia. There will be a large poster program in addition to the oral program of high quality talks covering aspects of E & P in all regions of Africa. *The best technical contributions will be recognized with prestigious awards from the HGS; as determined by a respected panel of industry judges.* The presentation ceremony will take place at the conference close.

- New and emerging exploration trends
- Gas and oil in N. and E. Africa
- Developing and integrating geological concepts: impact on exploration in Africa
- Big data, AI and innovative technologies applied to African E & P
- What we thought we knew – exploration concepts to production reality

Abstracts (up to 2 pages long including illustrations) should be sent as soon as possible and no later than March 15, 2018 to the technical committee, at Africa2018@hgs.org. Guidelines for abstract submission are available on the website: https://www.hgs.org/civicrm/event/info?id=1931

Oral presentations will be systematically arranged in a number of themed sessions and submissions on the following topics are particularly encouraged:

- African E & P in the evolving business environment – above ground risks & rewards

Extended abstracts, of unlimited length, are encouraged for accepted submissions

Details of sponsorship opportunities and exhibition booths are available at office@hgs.org or on the HGS website.

Registration will open in April, 2018. Early bird rates will be available: check the HGS website for details.

Board of Directors 2017–18

President (P)	John A. Adamick	TGS	713-860-2114	John.adamick@tgs.com
President-Elect (PE)	Cheryl Desforges	Consultant	713-463-9476	President-Elect@hgs.org
Vice President (VP)	Bob Wiener	Goh Exploration, Inc.	832-978-8123	rwiener@sbcglobal.net
Secretary (S)	Annie Walker		315-559-6433	secretary.hgs@hgs.org
Treasurer (T)	Mike Allison	Consultant	832-242-4406	mike@allisonkrewe.com
Treasurer Elect (TE)	Tarek Ghazi	Consultant	281-961-7632	tarek.ghazi@outlook.com
Editor (E)	Brian W. Horn	ION E&P Advisors	281-781-1061	brian.horn@iongeo.com
Editor-Elect (EE)	Jim Tucker	Occam Resources	301-807-9255	jtuckergeo@aol.com
Director 17-19 (D1)	Maggie Dalthorp	Consultant	361-877-3727	margaret.dalthorp@gmail.com
Director 16-18 (D2)	Dave Miller		832-362-4779	dwmiller.hgs@gmail.com
Director 16-18 (D3)	Mike Erpenbeck	Upstream Advisor Group	832-418-0221	mike.erpenbeck@hotmail.com
Director 17-19 (D4)	Steven Shirley	Chevron	832-854-4168	steven.shirley@chevron.com

Committee	Chairperson	Phone	Email	Board Rep.
AAPG House of Delegates	Steve Brachman	713-206-4472	sbrachman@wapitienergy.com	P
Academic Liaison	Paul Mann	713-743-3646	pmann@uh.edu	D2
Advertising	Bryan Guzman	832-503-4645	bryanguzman85@gmail.com	E
Africa Conference	Brian W. Horn	281-781-1061	brian.horn@iongeo.com	PE
Applied Geoscience Conferences – Mudrocks	Frank Walles	713-825-6136	Frank.Walles@bhge.com	P
Applied Geoscience Conferences – Geomechanics	Robert Hurt	770-367-5860	Robert.hurt@pxd.com	P
	Umesh Prasad	713-879-2529	Umesh.prasad@bhge.com	P
Arrangements	Bob Wiener	832-978-8123	rwiener@sbcglobal.net	VP
Awards	Mike Deming	713-503-1751	mike.deming.HGS@gmail.com	P
Ballot/Elections	Paul Hoffman	713-871-2350	phoffman@allen-hoffman.com	S
Calvert Fund	Carl Norman	713-461-7420	dod895@aol.com	PE
Communications Committee	Rosemary Laidacker	713-805-9672	rmlgeo@gmail.com	PE
	Dianna Phu	281-236-3131	hgs.socialmedia@gmail.com	PE
Continuing Education	Thom Tucker	281-413-0833	century@flash.net	D1
	Betsy Torrez	713-417-3602	torrezbj@aol.com	D1
	Cheryl Desforges	713-816-9202	cheryldesforges@hotmail.com	D1
Directory Committee	John Tubb, Jr.	713-805-5649	jbtjr@sbcglobal.net	D3
Earth Science Week	Sharon Choens	713-320-1792	Sharon.choens@sjcd.edu	D2
Educational Outreach	Letha Slagle	281-8915770	lslagle@comcast.net	D2
Engineering Council of Houston	Sue Pritchett	281-451-6522	Pritchett.Sue@gmail.com	D2
Environmental & Eng. Geology	Matthew Cowan	713-777-0534	mrcowan1@hal-pc.org	VP
	Troy Meinen	713-962-5495	troy.meinen@erm.com	VP
Exhibits	Stephen Adeniran	832-776-7578	s.adeniran@outlook.com	D3
	Gustavo Carpio	832-706-7619	gecarpio@gmail.com	D3
Field Trips	Ken Thies	713-598-0526	kenthies.kt@gmail.com	D1
Finance	Sameer Baral	281-837-6373	sameer.baral@gmail.com	T
Foundation Fund	Evelyn Medvin	713-328-2212	evelyn.medvin@corelab.com	PE
General Meetings	Bob Wiener	832-978-8123	rwiener@sbcglobal.net	VP
Golf Tournament	Elliot Wall	713-825-4599	elliot.wall@corelab.com	D4
Government Affairs	Henry Wise	281-242-7190	hmwise@yahoo.com	D4
	Arlin Howles	281-753-9876	arlinhowles@yahoo.com	D4
Guest Night	Pete Emmet	832-622-8963	pete.emmet.53@gmail.com	D4
HGS New Publications	William Rizer	503-852-3062	rizerwd@gmail.com	D1
HPAC	Bernadine Billard	281-543-0248	bcbillard@usa.net	S
International Explorationists	Steve Getz	713-304-8503	slgetz@outlook.com	VP
	Ryan Yarrington	713-575-4134	ryanyarrington@gmail.com	VP
Legends Night	John Tubb, Jr.	713-805-5649	jbtjr@scbglobal.net	P
Membership Growth	Gustavo Carpio	832-706-7619	gecarpio@gmail.com	S
Membership, New	Sharie Sartain	281-382-9855	smsartain1@comcast.net	S
Museum of Natural Science	Inda Immega	713-661-3494	immega@swbell.net	D2
	Janet Combes	281-463-1564	jmcombes@msn.com	D2
NeoGeos	Olamide Dada	281-690-6726	olamide.dada@bhpbilliton.com	D3
Nominations	John Jordan	713-594-5648	John.Jordan.062255@gmail.com	P
North American Explorationists	Donna Davis	832-517-7593	geology@texas.net	VP
	Martin Cassidy	713-503-8331	jo1955mar@aol.com	VP
Northsider's	Ian McGlynn	713-471-0576	ian.mcglynn@bhge.com	VP
	Nicole Arres	713-805-6923	nicole_arres@swn.com	VP
Office Management	John Tubb, Jr.	713-805-5649	jbtjr@scbglobal.net	PE
Outcrop Family Campout	Shannon Lemke	713-204-6768	slemke@newvistaep.com	PE
Science and Engineering Fair	Mike Erpenbeck	832-418-0221	mike.erpenbeck@hotmail.com	D2
Skeet Shoot	Gready Hunter	281-384-9035	greadyhunter@comcast.net	D4
Social Media	Dianna Phu	281-236-3131	hgs.socialmedia@gmail.com	D3
Tennis Tournament	Constantin Platon	205-218-7222	platonpc@gmail.com	D4
Vendor's Corner	Rich Germano	832-647-5630	rgermano@fastenergydata.com	TE
Video Committee	Linda Sternbach	832-567-7337	linda.sternbach@gmail.com	D3
Web Management	Linda Sternbach	832-567-7337	linda.sternbach@gmail.com	EE

HGS Office Director	Andrea Peoples	713-463-9476	andrea@hgs.org
HGS Administrative Assistant/Web Content Manager	Jacky Jordan	713-463-9476	jajordan@hgs.org

Applied Geoscience Conference

March 6-8, 2018

Integrated Approaches of Unconventional Reservoir Assessment and Optimization

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

DAY 1

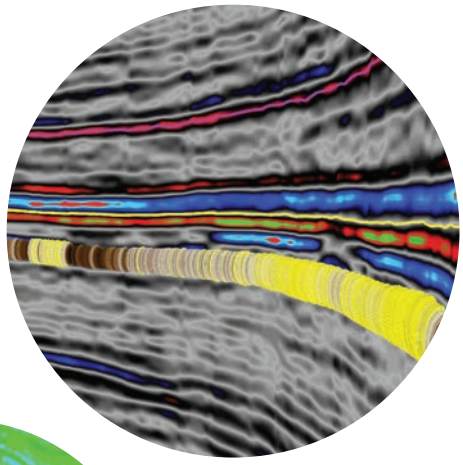
- **Session 1:** Diagenetic Components of Mudrocks and Their Impact on Production
- **Session 2:** Nanoscale Porosity and Hydrocarbon Phase Producibility / Wettability
- **Session 3:** Predicting petrophysical flow properties using digital rock physics
- **Session 4:** Geophysical Methods for Producibility,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

DAY 2

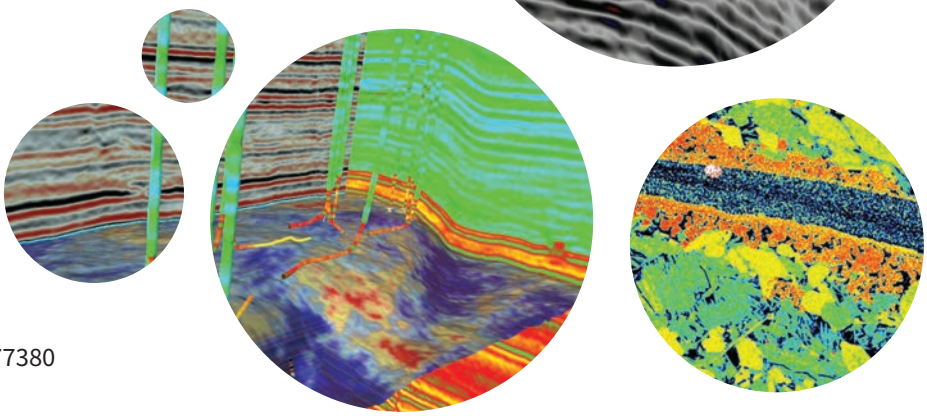
- **Session 5:** Analytical Applications for Improved Hydrocarbon Recovery
- **Session 6:** Hybrid Tight / Complex Opportunities
- **Session 7:** Technology Applications for Stimulated Rock Volumes Versus Drained Rock Volume
- **Session 8:** Operator Cases of Integrated Applied Geoscience for Fun and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

DAY 3

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



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



Anadarko

ANADARKO CONFERENCE CENTER
1201 Lake Robbins Drive, The Woodlands, TX 77380

Registration Open!

For more information please visit: www.hgs.org

John A. Adamick
john.adamick@tgs.com

Foundations…

Merriam-Webster defines a foundation as: a usually stone or concrete structure that supports a building from underneath: something (such as an idea, a principle, or a fact) that provides support for something.

The foundation of the Houston Geological Society without a doubt is its members. Our membership consists of geoscientists that are mostly located in the Greater Houston area. The foundation and success of HGS in the future depends on the support of young geoscience majors who join our profession and community.

As such, I'd like to focus today's article on the HGS Foundation and Calvert Fund. These groups are the basis for future foundations of the HGS through the good work they do in helping university students become professional geoscientists.

The Houston Geological Society Foundation is a 501(c)(3) organization that was founded to provide financial support to deserving undergraduate geoscience students through the award of scholarships. The Foundation specifically focuses on undergraduates at local universities including Rice University, the University of Houston, Texas A&M University, the University of Texas, Lamar University, Sam Houston State University and Stephen F Austin State University. The Foundation was formed in 1984 through a generous donation from Merrill Haas and has received countless contributions from others since that time. To date, 198 scholarships have been awarded and almost $300,000 given to worthy undergraduates. The Foundation is managed by **Evelyn Medvin**, a longtime trustee for the committee and seven other trustees.

The Houston Geological Foundation Scholarship 2017 Awardees

Calvert Scholarship 2017 Awardees

Calvert Scholarship Fund – The Calvert Memorial Fund is also a 501(c)(3) organization and provides scholarships for U.S. students enrolled in earth science graduate programs in our region. It is managed by a 5 member HGS board of trustees led by long-time chairman **Carl Norman**. The fund was formed in 1974 when it was initially funded by HGS member Warren Calvert and his wife Florence.

The fund began awarding scholarships in 1978 and to date has provided scholarships to 178 students from 26 different universities.

Collectively, the two funds have awarded hundreds of scholarships over time and many of those scholarship winners have gone on to geoscience careers in Houston. Both programs have corpus funds but each must also work hard each year to raise money to continue providing scholarships. In this time of giving near year end,

From the President *continued on page 19*

Brian W. Horn
Brian.Horn@iongeo.com

Finish Strong

Recently I had discussion with a colleague about advice her father had regarding the value of excellence at work. He was recalling his experience of colleagues he worked with for many years and how they had approached their job performance during their final days of employment. Some had taken positions with another firm and others had decided to retire after many years in the industry. His observations were poignant with regard to how these people decided to 'finish' their last days on the job. The descriptions varied from "checked out" to "short timer's disease" or more commonly "they just don't give a hoot". He noted the extreme exception was someone who brought the same quality and standard of work to the last two weeks of their job as they did the first two weeks. His insight was that people don't consider how they finish is usually the memory employers or colleagues have of their performance and capabilities. His reflections reminded me that a two-week experience of a careless attitude in the workplace can often eclipse a career of hard work and quality effort!

Embrace the challenges, choose to see the positive in as much as you can.

Many of us who have worked in the oil and gas industry for several decades and we have had the opportunity to watch colleagues finish their tenure of employment at various firms. For me what stands out is the rarity of individuals who finish the race and strive for perfection to the end. As a young geologist I recall working with the senior staff and watching what they did and how they worked. With some I was amazed at their ability to cobble together disparate pieces of information to create a narrative that supported a play concept or idea. Others seemed to slip into the behavior that I came to observe in which individuals took on the stigma of the "old and tired geologist". It was not that they lacked capability or for that matter their age or experience, rather, what became most evident was the sarcastic viewpoint of leadership or disdain for organizational structure that had evolved during their careers. It seemed to keep them from striving toward excellence they had previously shown in their careers. More than once I heard murmurings around the coffee pot where colleagues asked, "what does that person do?" Clearly many of these individuals were on a "glide landing" and only waiting for the day to ride off into the sunset.

As I have been looking toward the end of the year, planning for holidays, work schedule and project deadlines this discussion continues to float to the surface in my mind during moments of personal contemplation and planning. Thinking about my experience with previous colleagues I am forced to continue to evaluate my own performance and consider how I will strive to keep focused and finish strong. This doesn't need to be a comprehensive list of tasks to be checked off. On the contrary, this mentality can be a barrier to being effective at work as "checking the box" becomes the primary focus. Rather this is an issue of legacy. How do I want my colleagues to evaluate my contribution and performance?

The past two years have been difficult for many of us in the energy industry. While there are signs of improvement and encouraging events many in the geoscience community are still without work and considering their next opportunity. The "Black Swan" event of Hurricane Harvey left many people in the HGS community living in temporary or "deconstructed" housing and with the loss of personal possessions creating a difficult fall and uncertainty as we come toward the end of 2017. However, uncertainty is part of our lives as geoscientists. We evaluate and test ideas making observations and formulating theories to continue our quest for answers. There are five weeks left in the year and with all of the technology at our fingertips it is possible to accomplish a lot before 2018. I would encourage our membership to continue in your excellence at work, home and in life. Embrace the challenges, choose to see the positive in as much as you can. Take time to smile, laugh with others and at yourself. Remember we all have strengths and weaknesses. Embrace both of them for I believe these are the things that keep us motivated, humble, give us the strength and remind us to finish strong. ■

Applied Geoscience Conference

March 6-8, 2018

Integrated Approaches of Unconventional Reservoir Assessment and Optimization

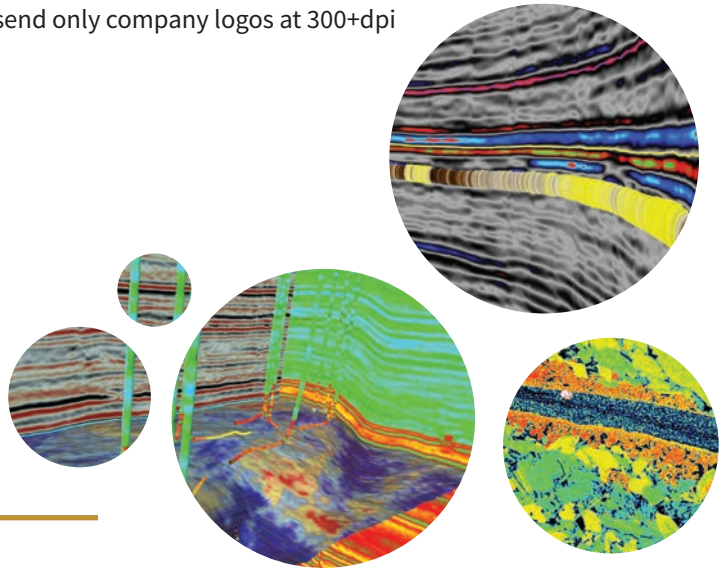
To sponsor, please indicate your sponsorship level _____ with payment (payable to HGS) to: **HGS, 14811 St. Mary's Lane, Ste. #250, Houston, Texas 77079, Attn: Andrea Peoples**. You may also email your completed sponsorship form to andrea@hgs.org.

Name	Phone	Amt. Enclosed
Company		Email
Billing Address		
Credit Card #	Exp. Date	Sec. Code#
Approved by		Date

If you would like HGS to invoice your sponsorship, please complete the section below:

Invoicing Address		
Accounting Contact Name		Contact Email Address
Special Billing Codes	Approved by	Date

Please email your company logo to andrea@hgs.org. Note: Please send only company logos at 300+dpi



Anadarko

ANADARKO CONFERENCE CENTER
1201 Lake Robbins Drive, The Woodlands, TX 77380

For more information please visit: www.hgs.org

Applied Geoscience Conference

March 6-8, 2018

Sponsorship Opportunities

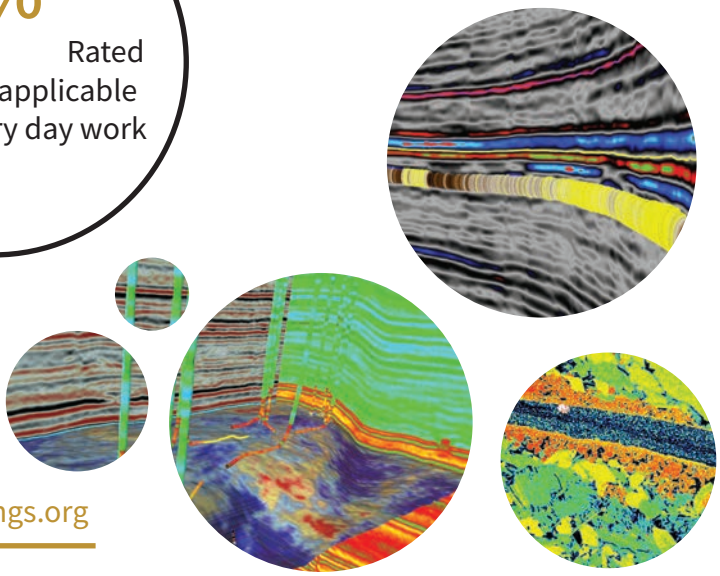
Brand your company with the premier event designed for integrated asset teams.

To sponsor, please contact Andrea Peoples at **andrea@hgs.org** or **713.463.9476**

OPPORTUNITIES	Platinum Sponsors $10,000	Titanium Sponsors $7,500	Gold Sponsors $5,000	Silver Sponsors $2,500	Bronze Sponsors $1,000
Logo on Sponsorship Banners	✔	✔	✔	✔	✔
Advertisement in Program Book	Full Page	1/2 Page	1/4 Page	1/8 Page	
Complimentary Full Registrations	4	3	2	1	
Complimentary Vendor Booth	✔	✔	✔		
Recognition by HGS in Program Book, onsite signage, post show highlights and thank you in HGS Bulletin	✔	✔	✔	✔	✔
Recognition in Conference Announcements and Website (logo with hyperlink)	✔	✔	✔	✔	✔

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



Mail Sponsor Request to:
Houston Geological Society
14811 St. Mary's Ln. Ste. 250
Houston, TX 77079

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

Monday, December 11, 2017

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

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

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

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

Stan Patniyot (Stratos Patiniotis)
Halliburton

Greece: Onshore and Offshore New Ventures

Greece is located in the East-Central portion of the Mediterranean region (**Figure 1**). Greece has recently received more exploration attention because of its attractive financial terms, its recovering economy, and its proximity to large fields recently discovered in the Eastern Mediterranean.

Figure 1. *Regional map of Mediterranean area. (the freebiedepot.com)*

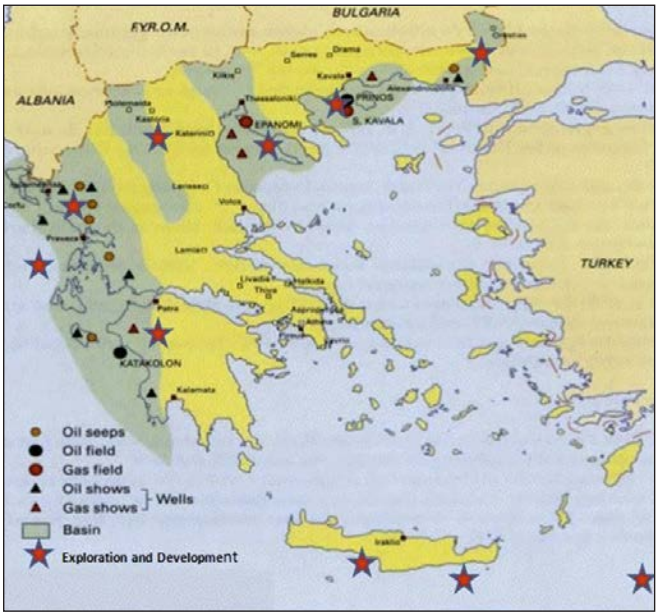


Figure 2. *Map of Greece with areas of exploration indicated.*

Historical exploration has proven the existence of active petroleum systems in Greek basins. The Early Miocene shale, Cretaceous Pelagic Limestone, and Early Jurassic Posidonia shale sections contain source rocks that are capable of generating large volumes of hydrocarbons and nearby analog fields indicate the attractiveness of the country (**Figure 2**).

Oil seeps are well known and three hundred wells have been drilled in the country. Modern exploration began with the 1971 discovery of the 289 MMBO Prinos Field and the 1974 discovery of the Kavala Gas Field in eastern Greece, offshore Thasos Island. These fields produce from Miocene sediments (**Figure 3**). These two discoveries were followed by the discovery of the 40 MMBO Katakolon oil field (1981) and the Epanomi gas field (1988). Due to the collapse in oil prices in the mid-1980s exploration essentially stopped in the subsequent years in spite of the proven petroleum systems in the eastern and western parts of the country.

In 1996 Greece held its first international licensing round where licenses were awarded to Enterprise Oil and Triton Ltd. Between 2000-2001 both companies had withdrawn because of mergers and low oil prices. In 2011 a new Hydrocarbon Law was completed governing exploration and production activities along with the creation of the Hellenic Hydrocarbon Resources Management Company S.A. (HHRM). Its mandate is to find investors, organize and oversee oil and gas exploration and production activities and monitor activities on behalf of the Ministry of Environment and Energy.

Under this new legal structure Greece held a licensing round in 2014 and Energean O&G acquired three blocks in western Greece. Recently discovered giant gas fields, Leviathan field, offshore Israel (19 TCF and 34 MMBC) and Zohr field, offshore Egypt (40 TCF) have generated interest in the hydrocarbon potential

HGS General Dinner *continued on page 13*

HGS General Dinner continued from page 11

offshore southern Crete (**Figure 4**). A joint venture representing Total, Exxon, and Hellenic Petroleum recently signed leases for blocks in the Ionian Sea offshore southern Crete.

Greece has launched an ambitious program to add more oil and gas reserves, partly spurred on by its protracted financial crisis. The clear message from Government Ministers is that Greece welcomes additional onshore and offshore exploration and should be an area of interest for new venture exploration. ■

Geologic time	Geology/Formation	Source	Reservoir	Seal
Plio-Pleistocene	Clays/Sandstones/Conglomerates			x
L. Miocene-E. Pliocene	Marls/Clays/-Sandstones		●	x
E. Miocene	Shales/Sandstones	◆		x
Oligocene	Flysch (Claystones prevail/Silt-Sandstones alternations)			x
L. Cretaceous-Eocene	Breccias Limestone		●	
E. Cretaceous	Pelagic limestones with intercalations of cherts & marls (VIGLA)	◆		
M.-L. Jurassic	Posidonia Shales	◆		
E. Jurassic	Shallow-water carbonates		●	
L. Triassic	Evaporites - Breccias (Andrite & salt with intercalations of Dolomite, limestone & shales	◆	●	x

Figure 3. *Generalized stratigraphic column of Greece.*

Biographical Sketch

Stan Patniyot (Stratos Patiniotis) was born in Greece and raised and educated in Melbourne, Australia. He graduated from the School of Earth Sciences at the University of Melbourne with a major in Geophysics. He began his career with as a wireline logging engineer for Schlumberger Services. Stan's first assignment was working the NW shelf of Australia 200 miles offshore logging exploration wells. He had several international assignments prior to being promoted to Field Service Manager. Stan joined Exxon in 1981 (Esso Australia) as a petrophysicist based in Sydney Australia. He worked several international assignments starting in Peru as operations manager of a Gearhart/Halliburton joint venture and computing center manager and petrophysicist in Caracas, London and Houston. In Houston he worked as an advisor to PDVSA-INTEVEP in Caracas under a technology sharing agreement with Halliburton. Stan moved back to Houston to work with Shell as Senior Petrophysicist as part of the Niger Delta exploration team. For the past 5 years Stan has worked in the new ventures group of Halliburton in Houston screening unconventional oil and gas properties in the US, UK, Latin America, Mexico, Far East, Middle East, Europe, Russia and Australia. He has stayed at the forefront of logging technology and interpretation and written and co-authored many technical papers and memorandums. Stan is a member of Society of Petroleum Engineers of AIME, The Society of Professional Well Log Analysts, Society of Core Analysts, AAPG, Texas Certified Geoscientist and The Houston Geological Society.

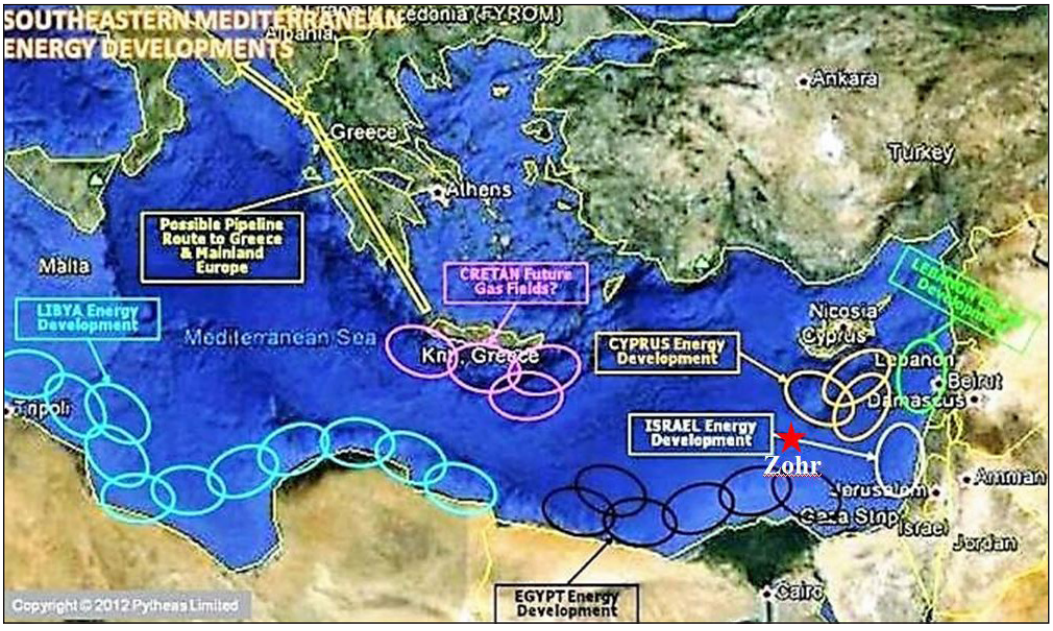


Figure 4. *Map of Eastern Mediterranean indicating active exploration and production.*

Wednesday, December 13, 2017

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

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

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

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

HGS Northsiders Luncheon Meeting

Daniel M Jarvie
Worldwide Geochemistry, LLC

Geochemical Assessment and Characterization of Petroleum Source Rocks and Oils, and Petroleum Systems, Permian Basin, U.S.

The Permian basin is comprised of three major sub-basins, the Midland basin, Central Basin Platform, and Delaware basin. These basins have many of the same source rocks with variation in organofacies and thermal maturity as well as geological histories (**Table 1**). The principal source rocks are found in the Permian Leonardian and Wolfcampian, Mississippian, and Devonian intervals with additional secondary source intervals. The key source rocks are the Woodford, Barnett, Wolfcamp, Spraberry, and Bone Springs.

Assessment of the stratigraphic sequence for prospective source rocks begins with TOC analysis to identify which rocks have the quantity of organic matter likely to generate commercial amounts of petroleum. **Figure 1** lists various formations in the Permian basin with their average TOC values based on analysis of archived cuttings. Archived cuttings often tend to provide lower TOC and pyrolysis yields than fresh cuttings and core samples. This phenomenon is related to sample quality, i.e., mixing of organic-lean and source rock intervals, often predominantly fines, and oxidation from storage.

Jones and Smith (1965) described five different petroleum systems strictly using elemental analysis of oils and their relative contents of carbon, oxygen, nitrogen, and sulfur. In the 1970s Jack Williams of Amoco inferred nine different petroleum systems based on geochemical analysis of over 500 oils (Williams, 1977). Recently Zumberge and Curtis (2017) showed a statistical analysis of oils and condensates from the Delaware basin with the inferred source rock type. In all cases many oils were placed in an unknown category either due to mixing, alteration or otherwise unknown sources. However, precise geochemical description of an effective source requires correlation between source and oils, which has not yet been accomplished in the Permian basin. We can describe most of these systems as probable or prospective, but not necessarily as effective since the correlation proof is absent.

Period	Age	Formation
Ordovician	Caradocian	Bromide
U. Devonian	Famennian/Kinderhookian	Woodford Shale
Mississippian	Chesterian	Barnett Shale
Pennyslyvanian	Atokan	Atoka, Cline Shale
Permian	Wolfcampian	Wolfcamp
Permian	Leonardian	Avalon, Bone Spring, Spraberry
Permian	Guadalupian	Delaware Mountain Group

Table 1. *Gross description of source rocks, Permian basin. While these source rocks dominate petroleum generation in the Permian basin, there are various divisions in these units that are both primary and secondary sources of petroleum. Among these geological periods, there is a total of fifteen different units capable of sourcing petroleum.*

Drawing on previous work by Smith and Jones, Williams, Jarvie et al., 2001, Hill et al., 2003, Jarvie, 2017, and Curtis and Zumberge (2017) various petroleum systems for the Permian basin are shown in **Table 2**.

	Source	Principal Reservoirs
I	Simpson	Ellenburger
II	Woodford	Silurian, Devonian
III	Barnett	Barnett, U. Devonian
IV	Cline (3 Finger)	Pennsylvanian
V	Wolfcamp	Wolfcamp, Dean
VI	Spraberry	Spraberry
VII	U. Leonard (Midland)	San Andres
VIII	L. Leonard (Midland)	Clearfork
IX	L. Leon. (DMG)	Pennsylvanian, Abo
X	Guadalupe (DMG)	Queen

Table 2. *Partial listing of petroleum systems of Permian basin based on the work of various authors. Source rock organofacies differences, high thermal maturity of condensate samples, mixing, and alteration of some oils limits correlation of all oils/condensates and source rocks.*

With the surge in unconventional tight oil exploration, extensive core is now available and provides upgraded sample data for specific horizons. Such high-quality data is important for restoring original TOC values and obtaining estimates of the original petroleum generation potentials for resource assessments. Restored TOC and petroleum generation potential for the Wolfcamp in the Delaware and Midland basins from core data are shown in **Figures 2 A, B**.

The composition of petroleum (bitumen) is one factor affecting producibility from tight oil reservoirs. The SARA composition (Saturates, Aromatics, Resins, Asphaltenes) affects flow particularly in black oil maturity tight oil systems. The resins and asphaltenes are viscous, high polarity constituents and will occlude pore throats by affecting wettability. This is exacerbated in reservoir rocks with higher adsorptive affinities especially at black oil window thermal maturity. Production SARA results are not necessarily indicative of in situ petroleum composition, which is the key for reservoir performance and well operating conditions. As the resins and asphaltenes crack with increasing thermal maturity, enhanced production occurs when these products are reduced. Thus, thermal maturity assessment becomes a critical measurement in determining petroleum quality and phase.

A key maturity assessment for economic value is the determination

HGS Northsiders Luncheon *continued on page 16*

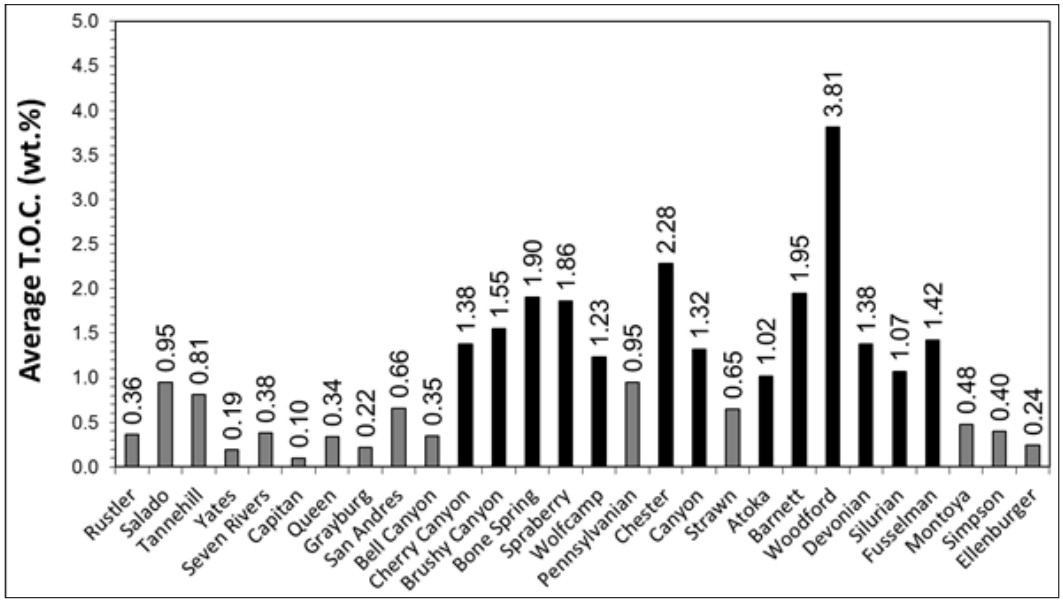


Figure 1. *Average TOC values from cuttings, Permian basin. Although these TOC values are low based on archived cuttings analysis, source rock units are readily recognized except for the Ordovician Simpson*

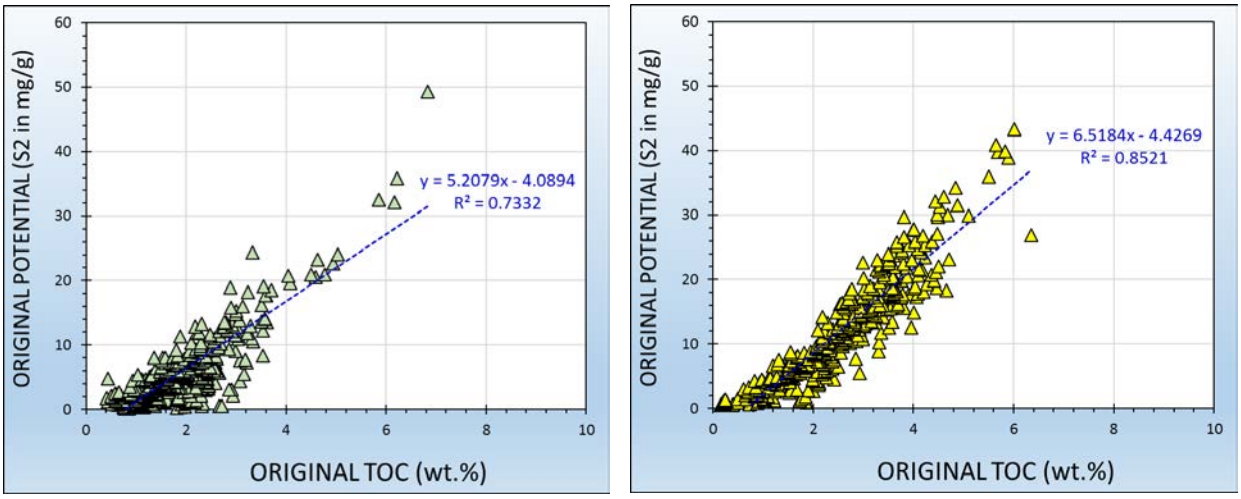


Figure 2. *Restored TOC and petroleum generation potentials for the Wolfcamp Shale in the Delaware (A, left) and Midland (B, right) basins.*

HGS Northsiders Luncheon continued from page 15

of the volatile oil window and the yield of petroleum liquids in the early gas window. Understanding the relationship of thermal maturity to oil cracking is a key factor in such assessments. Oil cracking is very commonly misstated in presentations, papers, and exploration discussions as it is often cited to occur at very high levels of thermal maturity (>1.5%Ro). Such statements are derived from cracking of saturated hydrocarbons, one constituent of petroleum. Petroleum (bitumen) is comprised of the aforementioned SARA constituents that have different, but overlapping cracking kinetics. Oil cracking begins virtually contemporaneously with its formation from kerogen. This is obvious from the improvement in oil API gravity with increasing oil window maturation that corresponds to a decrease in resins and an increase in saturated hydrocarbons.

Thermal maturity measurements by vitrinite reflectance in marine shales and carbonates present a challenge for organic petrographers. An alternative or complementary approach is the use of quantitative aromatic hydrocarbons such as shown by Hill et al. (2004) and Rocher et al. (2015). Analysis of this data is highly reproducible and provides data on both oils and rock extracts. Regardless of the correlation to vitrinite reflectance the values must be related to product type and phase.

Interpretation of geochemical data stating that a given resource is in the oil or gas window is insufficient and needs to be refined to specific product windows (**Figure 3**). The oil window is subdivided into black and volatile oil windows. The gas window is subdivided into condensate-rich wet, lean wet, and dry gas windows. Thermal maturity, hydrocarbon calorific values and GOR provide guidelines into these windows.

Thermal maturity must necessarily be related to product type and phase. One such parameter that is important for assessing yields of liquid petroleum and to assess prior to extensive drilling is gas-to-oil ratios (GOR).This information can be derived from samples where oil is extracted from reservoir rocks. The integration of thermal maturity with expected GOR is a valuable exploration and development interpretation tool. A simple geochemical assessment technique is high resolution gas chromatographic fingerprinting of oil and solvent-extracted oil from reservoir rocks. This technique provides an indication of producible oil API gravity even with the loss of a considerable portion of the light to intermediate range hydrocarbons due to evaporation (Holba et al., 2014).

Restoration of "lost" petroleum is derived from a gas chromatographic (GC) fingerprint of oil extracted from the reservoir rock and any native produced oils. Regardless of sample type there is always lost petroleum due to evaporation unless the sample is taken and preserved under reservoir conditions (**Figure 4A**). However, using a curve fitting approach such as Kissin (1987), Thompson (2002) or Holba et al. (2014) restoration of lost oil can be achieved by fitting unevaporated n-alkanes. Such a fit usually results a straight-line logarithmic fit on volatile oils and condensates and the petroleum composition may be restored with the fitting equation (**Figure 4B**). This is only applicable to volatile oil and condensate wet-gas windows.. This kind of restoration allows correlation to production GOR and provides an intrinsic value of the in situ petroleum GOR. In a dynamic reservoir changes in the GOR correlation requires initial or early production results to achieve this correlation, but appears to corroborate the GORs computed via the Mango and Jarvie (2001) technique.

A comparison between production results, compositional data and PVT analysis allows correlation between gas-to-oil ratios (GOR) and production. This provides additional criteria for pre-drill assessment of likely GORs from solvent extraction of rock samples (**Figure 5**). Using these geochemical assessment techniques in conjunction with other scientific data allows operators to high-grade prospective areas having the most economic products and target the best zones for completion. ■

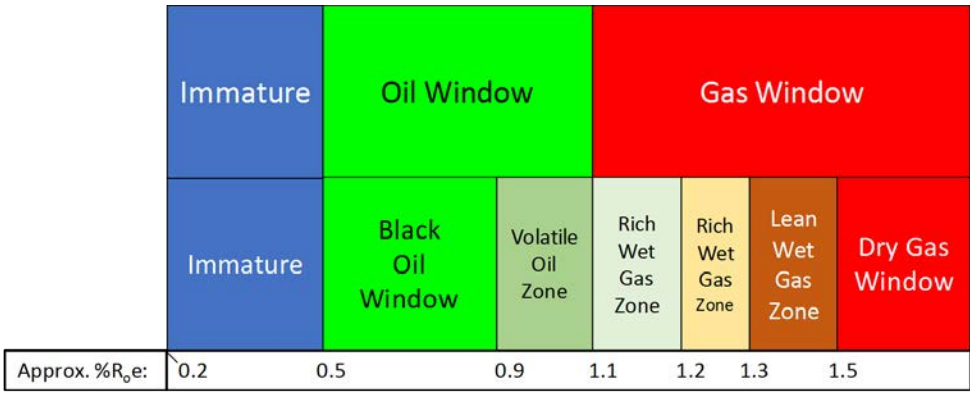


Figure 3. *General and specific petroleum generation windows with approximate thermal maturity values depicted by equivalent vitrinite reflectance values.*

References

Curtis, J.B. and J.E. Zumberge, 2017, An applied geochemical look at the Delaware basin petroleum systems, Delaware Basin Playmaker Forum, Midland, Texas, 22 February 2017, oral presentation.

Holba, A.G., R.L. Bone, B.J. Huizinga, J.R. Vasquez, and S.M. Stokes, 2014, Petroleum-fluid property prediction from gas chromatographic analysis of rock extracts or fluid samples, U.S. Patent PCT/US2013/053461, International Publication Number WO 2014/022794 A2, 33p.

Hill, Ronald J., Daniel M. Jarvie, Brenda L. Claxton, Jack D. Burgess, and Jack A. Williams, 2003, An Investigation of Petroleum Systems of the Permian Basin, USA, 21st IMOG Meeting, Krakow, Poland September 8-12, 2003.

Hill, R.J., S-T. Lu, Y. Tang, M. Henry, and I.R. Kaplan, 2004, C4-benzene and C4-napthalene thermal maturity indicators for pyrolysates, oils, and condensates, in Geochemical Investigations in Earth and Space Science: A tribute to Isaac R. Kaplan, eds. R.J. Hill, J. Levanthal, Z. Aizenshtat, M.J. Baedecker, G. Claypool, R. Eganhouse, M. Goldhaber, and K. Peters, The Geochemical Society, Pub. 9, 303-319.

Jarvie, Daniel M., Jack D. Burgess, Alex Morelos, Robert K. Olson, Phil A. Mariotti, and Robert Lindsey, 2001, Permian

HGS Northsiders Luncheon *continued on page 18*

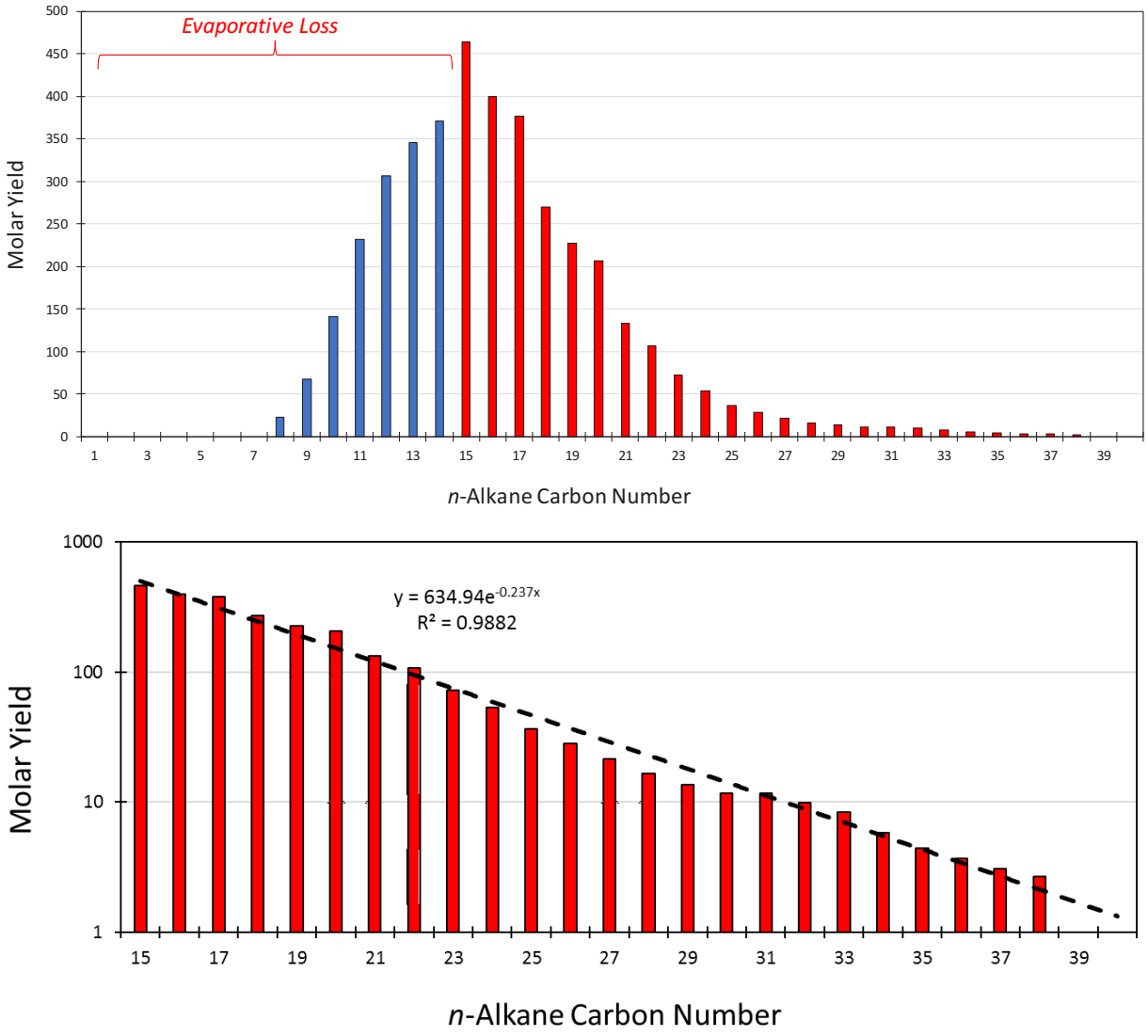


Figure 4 A, B. *Histogram of GC fingerprint of Wolfcamp Shale oil extracted from rock. A) (Top) Histogram of n-alkanes shows "lost" petroleum due to evaporation from the time of sampling to the time of analysis. Extended n-alkanes are present and yield an exponential fit of very high correlation. B) (Bottom) Logarithmic fit of normalized molar yields of n-alkanes that allows restoration of lost petroleum.*

HGS Northsiders Luncheon continued from page 17

Basin Petroleum Systems Investigations: Inferences from Oil Geochemistry and Source Rocks, AAPG Mid-Continent Section Meeting, Amarillo, Texas, September 30-October 2, 2001, AAPG Bull. Vol. 85, No.9, pp. 1693-1694, oral presentation.

Jarvie, D.M., B.M. Jarvie, W.D. Weldon, and A. Maende, 2015, Geochemical assessment of in situ petroleum in unconventional resource systems, URTeC paper #2173379, 20p.

Kissin, Y. V., 1987, Catagenesis and composition of petroleum: Origin of n-alkanes and isoalkanes in petroleum crudes, Geochim. Cosmo. Acta, Vol. 51, pp. 2445-2457.

Jones, T.S. and H.M. Smith, 1965, Relationships of oil composition and stratigraphy in the Permian Basin of West Texas and New Mexico, in Fluids in subsurface environments – A symposium, AAPG Memoir 4, p. 101-224.

Mango, F.D. and D.M. Jarvie, 2001, GOR from Oil Composition, 20th International Meeting on Organic Geochemistry, Nancy, France, Sept. 10-14, 2001, Abstracts Vol. 1, pp.406-407.

Rocher, D., C. Barrie, and J. Zumberge, 2015, Thermal maturity of light oils & condensates – 'VREQ' using GC-Triple Quad MS to measure alkyl aromatics, GeoMark Research Workshop, 26 August 2015, 38p.

Thompson, K.F.M., 2002, Compositional regularities common to petroleum reservoir fluids and pyrolysates of asphaltenes and kerogens, Org. Geochem., 33, p. 829-841.

Williams, J. A., 1977, Characterization of Oil Types in the Permian Basin, AAPG Southwest Section Meeting, Abilene, Texas, October 1977, author's preprint.

Biographical Sketch

Dan Jarvie has worked in the field of organic geochemistry since 1982 in various positions in laboratories and data interpretation. His early work was focused primarily on instrumentation and laboratory analyses. He has specialized in assessment of unconventional shale resource system over the last two decades. He founded and was president of Humble Instruments and Humble Geochemical Services from 1987 to 2007, which were sold to Weatherford in 2007. Dan served as Chief Geochemist for EOG Resources, Houston, Texas until April 2015. Currently he is working the onshore Tampico-Misantla basin, Mexico for Renaissance Oil and has various pro bono research projects underway.

Dan served in the U.S. Navy from 1968-1974 and graduated from the University of Notre Dame in 1976. He was mentored in organic geochemistry by Wallace Dow and Don Baker of Rice University. He is an adjunct professor at TCU and a member of the scientific board for TCU's Energy Institute. His residence has been on top of the Humble Salt Dome since 1981.

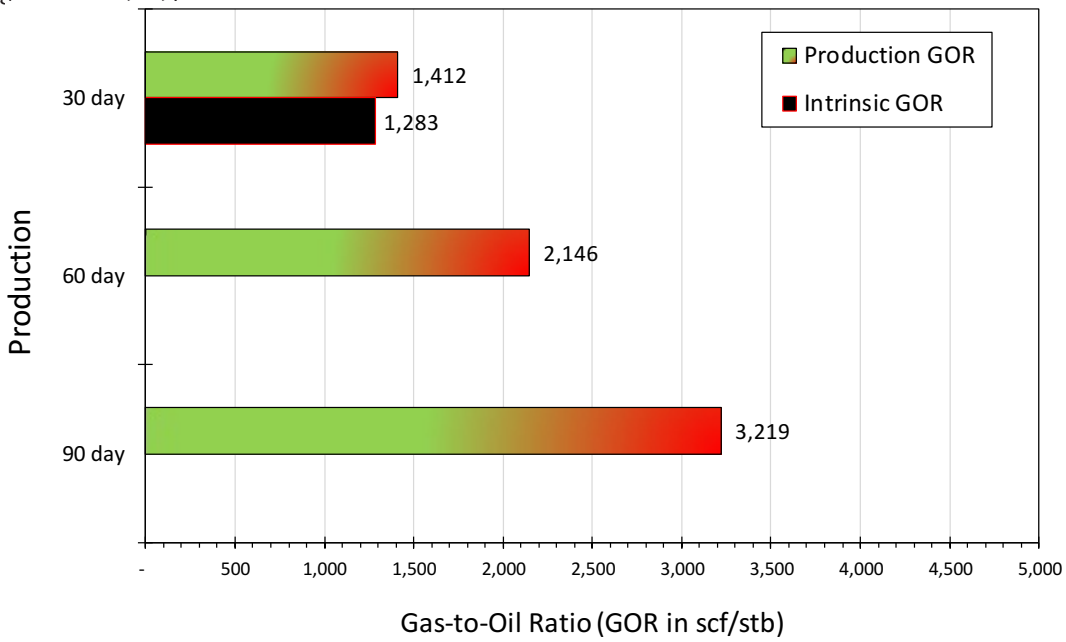


Figure 5. *Production versus intrinsic gas-to-oil ratio (GOR). Production GOR will change depending on a variety of reservoir and operating conditions. Intrinsic GOR is an indication of the in situ GOR based on restored gas and oil factors and is useful in assessment of reservoir development and production operating conditions.*

Wednesday, December 13, 2017

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

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

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

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

T. Wesley McCoy
Texas Board of Professional Geoscientists

ETHICS MOMENT

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

Texas Board of Professional Geoscientists

The Texas Board of Professional Geoscientists (TBPG) was set up under the authorization of Texas Occupations Code, Chapter 1002 (The Texas Geoscience Practice Act) in 2001. The Act became fully effective as of September 1, 2003. The TBPG licenses Geologists, Geophysicists and Soil Scientists, and administers the ASBOG® examinations, which are required in order to obtain a Texas P.G. license. The TBPG also enforces The Act and rules adopted by the Board under The Act. The TBPG also provides Geoscience Ethics training, as well as training required under The Act for state agencies which receive geoscience work. ■

Biographical Sketch

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

From the President

continued from page 5

please consider donating to one or both programs by visiting the HGS website at: https://www.hgs.org/civicrm/contribute/transact?reset=1&id=5.

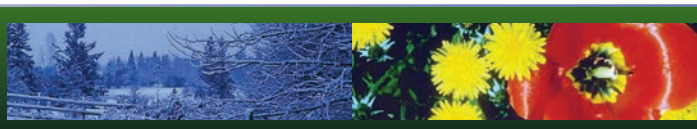
In addition to direct donations the Houston Geological Society in recent years has hosted a dinner meeting each year where the trustees of both groups recruit sponsors for the event. Many companies like the concept of helping students and become sponsors. The proceeds from the sponsorships are divided equally between the two groups. This year's event will be held on Monday, February 12, 2018 at the Norris Conference Center. In addition to a presentation by AAPG President **Charles Sternbach** on *Discovery Thinking,* the foundations will award scholarships and recognize recent scholarship winners at the event. This is always a fun evening so please mark it on your calendar and attend if you can.

Finally I'd like to recognize our two foundation chairmen, **Carl Norman** and **Evelyn Medvin**. Both have been active in the Society for many years. Carl joined the Calvert Fund when it was initiated way back in 1974. He was Secretary of the Fund in the beginning but became chairman some 20 years ago. He remains chairman today.

Evelyn Medvin has been on the HGS Foundation since 2005 and has been the primary fundraiser for the Foundation in recent years. She currently serves as chairman of the committee. In addition to her work with the Foundation, Evelyn served on the HGS Continuing Education Committee from 2000-2007 and was Co-Chair for a Dry-Hole Seminar and the Geopressure workshop.

If you get a chance please thank these two individuals for their service. They and their committees are helping build the foundation of the HGS for years to come! ■

December 2017



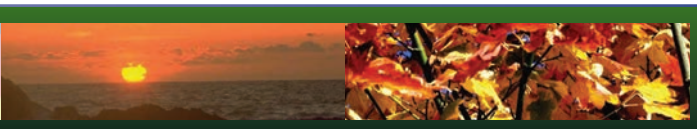
Sunday	Monday	Tuesday	Wednesday

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

Members Pre-registered Prices:

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

3	4	5	6
10	11 **HGS General American Dinner Meeting** *"Greece: Onshore and Offshore New Ventures,"* *Stan Patniyot* *Page 11*	12 **HGS Board Meeting** *6 p.m.*	13 **HGS Northsiders Luncheon Meeting** *"Geochemical Assessment and Characterization of Petroleum Source Rocks and Oils, and Petroleum Systems, Permian Basin, U.S.,"* *Daniel M Jarvie* *Page 14*
17	18 HGS Office Closed for the Christmas Holidays from December 18, 2017 and Reopens January 2, 2018.	19	20
24 31	25 *Christmas Day*	26	27



GeoEvents

Thursday Friday Saturday

Don't wait, make your reservations online at hgs.org	1	2
7	8	9
14 **HGS Environmental & Engineering Dinner Meeting** *"Texas Board of Professional Geoscientists," T. Wesley McCoy Page 19*	15	16
21	22	23
28	29	30

March 6-8, 2018
HGS Applied Geoscience Conference
Integrated Approaches of Unconventional Reservoir Assessment and Optimization
The Woodlands, TX (Page 4)

April 27-29, 2018
Take a kid to the outcrop family campout
Camp Cullen YMCA
Trinity, TX

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

Applied Geoscience Conference Geomechanics in Unconventionals

The 2018 Houston Geological Society Applied Geoscience Conference – Geomechanics in Unconventionals was opened by HGS president **John Adamick** on November 8, 2017 at the Southwest Energy Conference Center. Ron Hayden, Southwest Energy Vice President of Technology was there to welcome all participants to the facility for the two-day event. This bi-annual conference provided an update on the latest research on unconventional geomechanics being done by universities and industry.

The HGS Geomechanics Conference Committee sas lead by General Chairs **Robert Hurt** and **Umesh Prasad** and supported by twenty-two industry experts.

The Program Included

- Sixteen recognized leaders in the oral program of four formal sessions that focused on
  - Geomechanical Characterization
  - Engineering Applications
  - Surveillance and Diagnostics
  - Case Studies
- Twelve graduate student posters demonstrating research at eight universities.
- The Keynote Presentations were given by
  - **Terry Engelder** of Penn State University gave a talk entitled "What Maintains High Pore Pressure on Gas Shale During Exhumation, Long After Thermal Maturation Ceases"
  - **Lans Taylor** of the Energy and Geoscience Institute (EGI) at the University of Utah gave a talk entitled "Optimized Recovery from Unconventional Reservoirs: How Nanophysics, the Micro-Crack Debate, and Complex Fracture Geometry Impact Operations".

The oral presentations were selected by the session chairs leading to the success of the conference. Each session was concluded with a one hour of discussion that allowed all conference participants to engage in robust dialogue with the experts. All oral program speakers received HGS speaker awards consisting of a large specimen of chlorite garnet schist with a brass plaque. The awards were provided through the efforts of the HGS Speaker Award Committee Chair **Mike Deming**. The invited university student poster presenters (with invitation through

John Adamick HGS President

Panel Disscussion 2

Robert Hurt Geomechanics Committee Chairman

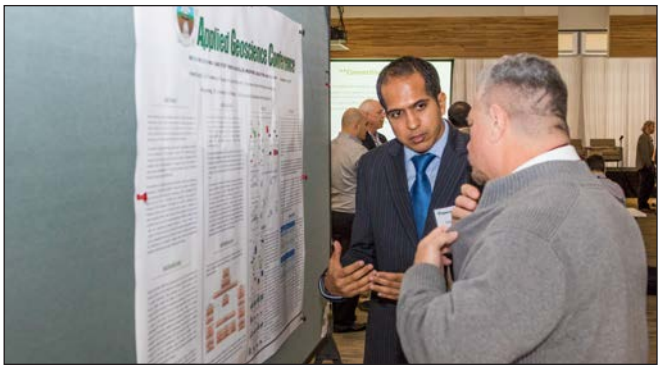
Terry Engelder and Umesh Prasad

their professors) received up to $500 toward their travel expenses and complimentary registration for the event.

The *2017 HGS Gerald A. Cooley Award* was given to **Frank Walles**. Frank is the past General Conference Chair (2013 and 2015) and originator of this conference and served as a special advisor to the chairman for this year's event.

A conference program was provided to all participants containing abstracts (many of which are expanded versions) and speaker bios for all of the talks. Additional copies are available for purchase through the HGS office.

From left to right: Ishank Gupta - Best Poster; Mathew Ramos - Second Runner up; Zhi Ye - First Runner up



Robert Hurt – Geomechanics Committee chairman and Ishank Gupta – Student Poster winner

The student poster session sponsorship was generously provided by the Baker Hughes Corporation.

- The **Best Poster Award** went to MSc student Ishank Gupta from the University of Oklahoma who presented his research entitled "Water Weakening: Case Study from Marcellus, Woodford and Eagle Ford".
- The **First Runner Up Award** went to went to PhD student Zhi Ye from the University of Oklahoma who presented his research entitled "Mechanical Properties and Permeability Evolution of Shale Fractures under Triaxial Loading".
- The **Second Runner Up Award** went to went to PhD student Matthew Ramos from the University of Texas who presented his research entitled "Stress-Dependent Dynamic-Static Transforms of Anisotropic Mancos Shale".

An evening social event was also held at the Southwest Energy Conference Center and provided an additional opportunity to review the student posters and the sponsor booths as well as allow more time for discussions with the oral presenters and for general networking.

The event was generously supported by many industry sponsors including for the event venue. *We are particularly thankful to Southwest Energy for allowing the use of their Conference Center* which made it possible for HGS to offer this program at a very reasonable cost. ■

Thank You to Our Platinum University Poster Program Sponsor

BAKER HUGHES a GE company

HGS Applied Geoscience Conference

March 6-8, 2018

See pages 4, 8-9

Geohazards at Panther Creek
Earth Science Week Family Field Trip 2017

by Neal Immega, Sharon Choens, Inda Immega, Lynn Travis

Panther Creek showing megaripples and debris high in the trees after Hurricane Harvey.

This year's Earth Science Week Field trip was at Panther Creek near the Woodlands. This was a perfect after-Harvey geohazards example. A good part of the creek is in the Montgomery County Nature Preserve – this designation prevents construction and the forest only had a few toppled trees. The county has done what it could by building baseball diamonds a bit higher than the Preserve but there was a lot of acreage that is zoned commercial. They only had debris on the ball fields after Hurricane Harvey. Some area businesses may have wished they had asked someone for a site hazard survey or consulted a topo sheet.

"Timing is everything" and we missed having perfect weather by one day. An inch of rain in the morning filled the creek and must have scared nearly everyone away – our attendance was lower than normal. The day started out in a very gloomy mode but brightened by noon. Too bad for those who stayed home, there were great things to see. These included a bridge that was damaged by debris going over the top, because the river narrows just before the bridge. During the Harvey storm, the river was so high and moving so fast that 40-foot ripples were formed. I have never seen such large ripples outside of Washington state scablands. The picture below shows the megaripple on the far bank along with whole trees jammed into the forest 10 feet above current river level.

HGS field trip guides: Eric Scott, Lynn Travis and Neal Immega

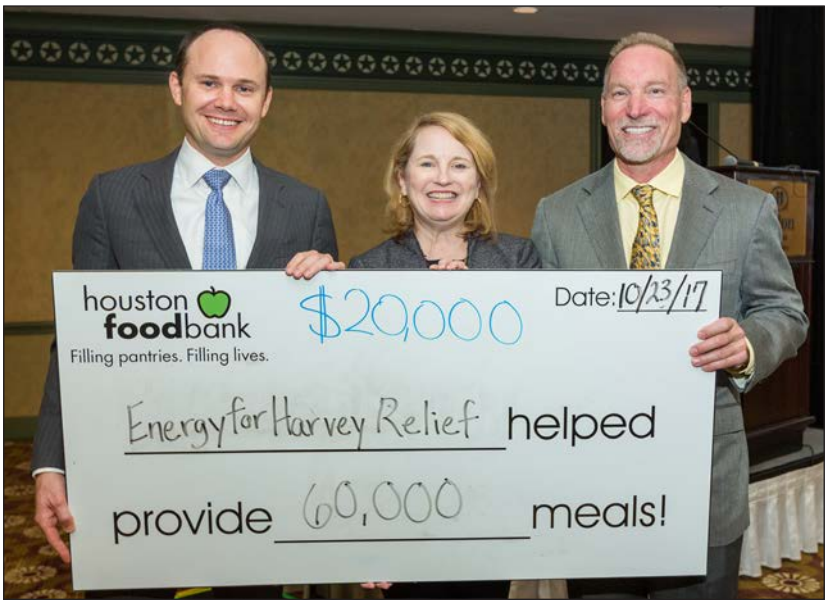
We had an excellent turnout of HGS volunteers and pleased feedback from visitors.

If you missed this trip, you can visit this public nature area any time. Erik Scott has written a fantastic guidebook for you use. Download his guide from https://www.hgs.org/committee?cmtegrp=sci&committee=Earth%20Science%20Outreach%20Committee ■

Remember, HGS sponsors a free, public, family-friendly field trip every October during Earth Science Week.

We celebrate at the Houston Museum of Natural Science on the second Saturday in October and the field trip is the next weekend. Watch the HGMS web page!

Raising $20,000 for Houston Food Bank's Hurricane Harvey Relief



Derek Detring (Left, President, Detring Energy Advisors) presenting the check for $20,000 raised to Amy Ragan (Center, Chief Development Officer, Houston Food Bank) and David Payne (Right, VP Chevron Corp and Member of Houston Food Bank Board of Directors).

Hurricane Harvey's impact on Houston and the surrounding communities was beyond devastating, but Texans' response to the disaster has been equally immense. For every person who was or knew someone who was affected by the Hurricane, there was another who stepped in to help with the recovery efforts. With the futures of so many still uncertain a group of young professionals in the energy industry, came together with a singular goal – to help.

On October 23rd with less than two months of planning and organizing, these volunteers hosted Energy for Harvey, a fundraiser benefiting the Houston Food Bank's Hurricane Harvey relief efforts. Energy for Harvey raised over $20,000, providing 60,000 nutritious meals to families in need. This grassroots event was made possible through the generous donation of time and effort by organizing volunteers, speakers, special guests, sponsors and attendees. On behalf of the organizing team we would like tothank all of the participants. We appreciate your support and commitment to helping South Texas rebuild.

The Event Highlights

Glenn Hegar, Comptroller of State of Texas. He spoke about the economic damage caused by Hurricane Harvey, how the State of Texas can move forward, and what lessons we can learn from Harvey to avoid similar damage in the future.

Glenn Hegar, Comptroller of State of Texas, discussing Hurricane Harvey's financial impact on Texas and how we can better prepare for such events in the future.

Amy Ragan (Chief Development Officer, Houston Food Bank) highlighting the Food Bank's efforts during and after the hurricane, and how Houstonians can help in the relief efforts moving forward.

Sponsors & Partners
Detring Energy Advisors – Title sponsor and organizing company
Houston Geological Society & NeoGeos – Silver Sponsor and organizing partner
Hart Energy – Silver Sponsor and Media & Marketing Partner

Gold Sponsor
1Derrick

Silver Sponsors
Petrophysical Solutions Inc, Houston Geological Society, Darcy Partners, Hart Energy

Bronze
Star Creek Energy, Taos Resources, Global Edge Consultants, TGS, Subsurface Consultants Associates, Jordan Consulting

Other Partners
713 Photography, Kimiagar Foundation

Special thanks to: Hilton Houston Westchase, who generously donated the venue and dinner. To host your event at Hilton Houston Westchase (9999 Westheimer) contact Mike DiLeone, Director of Sales & Marketing (mike.dileone@interstatehotels.com)

Jim "Mattress Mack" McIngvale (Gallery Furniture) sharing a Hurricane Harvey story of when a Gallery Furniture truck was used to rescue Houstonians from flood waters.

Lucie Wuescher (Managing Director, KPMG) emceeing the event and sharing a story about her own house being severely impacted by Hurricane Harvey.

Amy Ragan, Chief Development Officer at Houston Food Bank, spoke about the work the Food Bank has done during and since Harvey and how the efforts will continue over the coming months and how Houstonians can get involved and help.

David Payne, Vice President at Chevron Corp, and member of the Houston Food Bank Board of Directors, spoke about Chevron's experience with Harvey and similar hurricanes, highlighting the ways corporations such as Chevron partner with organizations such as Houston Food Bank.

Jim "Mattress Mack" McIngvale, shared a story from the worst night of the Hurricane, where a Gallery Furniture truck was used to save a number of Houstonians from flooding and how neighbors and friends can and should help others in times of need.

The evening was hosted by Lucie Wuescher, Managing Director at KPMG, who was the Master of Ceremonies for the event despite her own house having been severely flooded.

Anastasia Semenova, Miss South Texas 2018 and recent Petroleum Engineering graduate from University of Houston, volunteered to attend and bring further attention to the event. ■

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 (August 2017)

White House Releases Research and Development Budget Priorities for FY 2019

Mick Mulvaney, Director of the White House Office of Management and Budget (OMB), and Michael Kratsios, Deputy Assistant to the President at the Office of Science and Technology Policy (OSTP), issued a memo for the heads of executive departments and agencies regarding the budget priorities for research and development (R&D) in fiscal year (FY) 2019. The memo highlights R&D priority areas for formulating FY 2019 budget submissions, provides additional guidelines for balancing new priorities with existing demands, and encourages R&D investments that best serve the American people, according to OMB.

The main priority areas identified in the memo include American military superiority, homeland security, economic growth, energy independence, and public health. Following the lead of previous FY 2018 budget guidance, the memo emphasizes that federally-funded energy R&D should focus on private sector cooperation, particularly for commercialization and funding of later-stage R&D. The memo also encourages funding basic research that drives economic prosperity by empowering the private sector to take later-stage research to the marketplace.

The Priority Practices called out in the memo highlight increasing government accountability and efficiency, and direct agencies to ensure that R&D proposals do not duplicate existing projects, are based on sound science, and have the potential to contribute to the good of the American public. The memo also asks agencies to identify R&D projects that could be undertaken by the private industry sector, and to modify or eliminate projects for which federal involvement may no longer be necessary.

The Workforce and Education section of the memo presses for strong Science, Technology, Engineering, and Mathematics (STEM) education and apprenticeships to build a strong American workforce. In particular, it dictates that agencies should prioritize expansion of the STEM workforce to women and other underrepresented groups.

Scientific Societies Question Red Team/Blue Team Climate Debate

Earlier this year, Environmental Protection Agency (EPA) Administrator Scott Pruitt proposed an initiative to challenge mainstream climate science's consensus on human contributions to climate change through a red team/blue team debate--modeled after a military exercise in which the red team is designated to attack, and the blue team is put on defense. In the case of the proposed climate debate, the topic would be the research behind anthropogenic climate change. Several scientific societies, however, sent a letter (https://mcmprodaaas.s3.amazonaws.com/s3fs-public/AAAS%20CEO%20Rush%20Holt%20and%2015%20Other%20Science%20Society%20CEOs%20Request%20Climate%20Science%20Meeting%20with%20EPA%20Administrator%20Scott%20Pruitt.pdf?utm_medium=email&utm_source=FYI&dm_i=1ZJN,53BMK,PDB1B5,JIDT5,1) to Administrator Pruitt, expressing their concern about the need for such an exercise.

The letter, signed by sixteen scientific societies, focuses on the peer review process and its role in ensuring the robustness of published science. The authors of the letter argue that the general idea of the red team/blue team debate is essentially an aspect of the peer review process which scientific papers must go through before they are published. The current scope of published climate science research reflects decades of ongoing review, with the testing and evaluation of research findings already an integral aspect of the process.

In the letter, the scientific societies noted that they would welcome further discussion and respond to any questions about existing climate research or the peer review process.

Senate Confirms Federal Energy Regulatory Commission Nominees

The Senate confirmed two new members for the Federal Energy Regulatory Commission (FERC) on August 3, 2017. Neil Chatterjee, former aide to Senate Majority Leader Mitch McConnell (R-KY), and Robert Powelson from the Pennsylvania Public Utility Commission have joined Commissioner Cheryl LaFleur, bringing the number of empty FERC seats down to two.

Chatterjee was Senator McConnell's energy policy advisor before his FERC nomination, and was integral to shaping the Senator's energy-related legislation. Prior to working with Senator McConnell, Chatterjee worked in Government Relations for the National Rural Electric Cooperative Association and as an aide to former Representative Deborah Pryce (R-OH-15). Chatterjee will serve as the new FERC Chairman.

Powelson served on the Pennsylvania Public Utility Commission from 2008-2017, acting as Chairman from 2011-2015. In 2011, Powelson served on Pennsylvania's Marcellus Shale Advisory Commission, developing a comprehensive proposal for the energy development of the Marcellus Shale. Powelson is also a past president and former member of the Board of Directors for the National Association of Regulatory Utility Commissioners.

The three commissioners will work in tandem to regulate interstate energy transmission and review proposals for interstate energy development and permitting, as well as enforce FERC regulatory requirements. Chatterjee and Powelson's confirmations give the commission a voting quorum, allowing it to issue major decisions.

President Trump has also nominated Richard Glick, senior Democratic Senate Aide to the Energy and Natural Resources Committee, and Kevin McIntyre, an energy lawyer at the firm Jones Day, to fill the remaining two spots on the commission. Their confirmation hearings are set for September 7, 2017.

Wildfires Emerging as a Hot Topic on the Hill

As the U.S. endures another fire season, legislators on the Hill are seeking to address some of the challenges associated with managing wildland fires on federal land. A hearing held by the Senate Committee on Energy and Natural Resources on August 3, 2017 tackled the complex challenges in reducing wildland fire risk, focusing primarily on wildfire management programs and technologies.

The hearing discussed the collaboration that is required to reduce risks to firefighters, communities, and resources, and covered the emerging technological and budgeting hurdles facing wildfire management. Committee Chair Lisa Murkowski (R-AK) and Ranking Member Maria Cantwell (D-WA) both expressed support for implementing new technologies such as drones and tanker aircrafts to fight fires more efficiently, and weather models to better predict fire behavior.

Republicans and Democrats agree that funding is one of the main obstacles to effective wildfire management, and have introduced legislation this year to address the financial burden. The National Flood Insurance Program (NFIP) Reauthorization Act of 2017 (S.1571), which was introduced by Senator Mike Crapo (R-ID) in July and cosponsored by Senator Sherrod Brown (D-OH), includes a provision to classify procedure for the declaration of wildfires as major disasters. This new requirement would allow the U.S. Forest Service to use disaster relief funds from the Federal Emergency Management Agency (FEMA) when fighting fires, thus reducing or ending the practice of "fire borrowing" wherein the U.S. Forest Service and Department of the Interior (DOI) utilize funds from non-fire accounts to pay for fire suppression activities. The Senate has not taken action yet on the bill.

Federal Science Agencies Help Prepare and Respond to Hurricane Harvey

In anticipation of Hurricane Harvey making landfall on the Gulf Coast, the U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), and National Aeronautics and Space Administration (NASA) were preparing for the massive storm by monitoring its development and helping to direct the Federal Emergency Management Agency's (FEMA) resources towards the likely hard-hit areas.

The USGS teams on the ground deployed storm-tide sensors to measure storm surge levels and the effects of flooding on the coast. The USGS also implemented their Coastal Change Forecast Model to predict beach erosion caused by the storm, which could be used by emergency managers to identify high-risk areas to evacuate. The USGS streamgage network, which operates year-round, measured flood levels as rain inundated Texas.

NOAA and NASA satellites were used to track the storm as it developed, assisting with predictions related to wind speeds, precipitation levels, and storm risks. On August 22, 2017, days before Harvey reached the coast, NOAA's National Hurricane Center (NHC) predicted that rainfall would exceed two feet, with strong storm surges and flooding resulting from hurricane-force winds as Harvey moved onto land. NASA's Soil Moisture Active

Government Update *continued on page 30*

Government Update continued from page 29

Passive (SMAP) satellite measured soil moisture in Texas before Harvey, finding that soils were already saturated with water before the storm hit, indicating a higher flood risk.

FEMA and its federal partners will continue to mobilize personnel and resources to support state, local and tribal efforts throughout Texas and Louisiana. Relief and recovery funds will likely come from FEMA's Disaster Relief Fund, which needs to be funded with the rest of the Federal Budget in order to provide aid past September 30, 2017.

Federal Agency Declares Gulf of Mexico Safe for Seismic Surveys

The Bureau of Ocean Energy Management (BOEM) declared on August 8, 2017 that the Gulf of Mexico is safe for seismic surveys. BOEM's Programmatic Environmental Impact Statement (PEIS), a review conducted in tandem with the Bureau of Safety and Environmental Enforcement (BSEE) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), assessed the potential environmental impacts of geological and geophysical activities on marine ecosystems associated with the proposed 2012-2017 Outer Continental Shelf (OCS) Oil and Gas Leasing Program. The review has been in progress since 2013.

Seismic surveys are undertaken in order to explore for oil and natural gas, locate potential areas for renewable energy projects, and support marine mineral resource programs. In a recent House Natural Resources Subcommittee hearing on offshore energy development in the Atlantic, witnesses discussed the potential for oil and gas exploration, although some raised concerns about the safety of seismic surveys for marine life. BOEM concluded from its environmental review that geophysical surveys of the Gulf of Mexico would not cause major harm to the ecosystem.

Expanding seismic surveying in the Gulf's OCS is an instrumental step for the implementation of President Trump's executive order, "Implementing an America-First Offshore Energy Strategy." ■

HGS Welcomes New Members

New Members Effective November 2017

ACTIVE MEMBERS

John Karlo

Steven (Cody) Lenert

Austin Luker

Alberto Mezzatesta

Will Middlebrook

Farid Mohamed

Timothy Sheehy

Nancy Slatter

Devndra Nath Tiwary

Mohammad Ullah

Jaap Veldkamp

Joel Walls

ASSOCIATE MEMBERS

Russ Whisonant

STUDENT MEMBERS

Marianne Coholich

Teri Arceneaux

Garrett Goettel

Paul Minor

Lisa Siceloff

Jeffry Tahtouh

Anthony Warren

Welcome New Members

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

September 11-12, 2018 • Houston Texas

Guidelines For Abstract Submission

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

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

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

Abstracts should be:

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

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

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

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

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

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

September 11-12, 2018 • Houston Texas

Guidelines For Abstract Submission Continued

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

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

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

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

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

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

HGS *Bulletin* Instructions to Authors

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

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

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

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

HGS *Bulletin* Advertising

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

Random Inside Ad Placement Black & White Prices Shown – Color add 30% to prices below					**Specific Page Color Ad Placement**					
No. of Issues	Random Eighth Page	Random Quarter Page	Random Half Page	Random Full Page	Inside Front Cover Full Page	Inside Back Cover Full Page	Page 2 Full Page	Outside Back Cover Half Page	Back of Calendar Full Page	Calendar Quarter Page
10	$950	$1,350	$2,550	$4,750	$8,000	$7,500	$7,050	$6,850	$6,650	$3,000
9	$800	$1,300	$2,500	$4,700						
8	$750	$1,250	$2,250	$4,300						
7	$600	$1,100	$2,200	$3,850						
6	$550	$950	$1,800	$3,500						$2,000
5	$500	$800	$1,600	$3,000	$4,700	$4,500	$4,350	$4,000		
4	$450	$650	$1,300	$2,500						
3	$300	$550	$950	$2,000						$1,000
2	$250	$400	$700	$1,500						
1	$150	$250	$450	$1,000	$1,500	$1,400	$1,250	$1,000	$1,250	$850

Professional Directory Section Business Card Ad: 10 Issues – $160 ($30 for each additional name on same card)

Website Advertising Opportunities

There are currently 5 opportunities to help spread the word about your business or event and generate traffic to your website or campaign. Please submit all ad materials five (5) days prior to the go-live date for testing.

Placement	Rate	Specifications/Description
HGS Website Home Page Banner Ad	$800 – Monthly	275 x 875 pixels; home page top banner ad. All Home Page Banner Ads rotate every 10 seconds.
	$1800 – 3 Months	
	$2800 – 6 Months	
	$3600 – 12 Months	
HGS Website Home Page Column Ad	$700 – Monthly	200 x 400 pixels; home page right column ad
	$1500 – 3 Months	
	$2400 – 6 Months	
	$3600 – 12 Months	
HGS Website Event Page Ad	$600 – Monthly	200 x 400 pixels; calendar page left column ad. All Event Page Ads rotate every 10 seconds.
	$1200 – 3 Months	
	$1600 – 6 Months	
	$2600 – 12 Months	
Geo-Jobs	$50 – 14 days	Posting of job opportunities on HGS website. Click the Geo-Jobs tab to get started. Must be filled out completed and the dates set appropriately.
	$100 – 30 days	
	$300 – 3 Months	
	$600 – 6 Months	
	$1200 – 12 Months	
Vendor Corner	$250 *4 Pack option with 1 FREE bonus event for $1000.00 available. Send request to vendorcorner@hgs.org.	Company logo, company website, and company description will be highlighted on HGS Calendar website event. This is an opportunity to display company wares, gain personnel exposure and hand out product information at HGS dinner meetings.
Event/Short Course Calendar Ad	$100 – Monthly	An event ad posted within the HGS website calendar under the Events tab.
Bundle & Save!	• 30% off website ads when combined with print ads in all 10 HGS *Bulletin* issues. • 20% off website ads when combined with print ads in 5 HGS *Bulletin* issues. • 10% off website ads when combined with print ads in 3 *Bulletin* issues.	

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 $30.00; emeritus members pay $15.00; 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 ❑ North American E&P (other than Gulf Coast)

❑ International E&P ❑ 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 5/02/17

Professional **Directory**

Available for Consulting in México or Other Countries

Victor H. Abadie III
Consulting Geologist

México: Consultant to Pemex Exploration and Review Exploration Portfolio
Colombia: New Ventures Exploration; Sell Prospects
USA: Prospect Evaluation, Leasing, Buy Working Interests

650.201.0528 • vic@montara.com
Post Office Box 81/1390 Main Street • Montara CA 94037-0081
AAPG/DPA, SIPES, Calif. Reg. Geologist, Tex Reg. Geologist

Where is your Business Card?
$160 per 10 Issues
713-463-9476

NOLEX

Kevin McMichael
kmcmichael@nolexllc.com

350 N. Sam Houston Pkwy., E.
Suite B118
Houston, Texas 77060
713-655-9700
713-655-9709 *fax*

201 St. Charles Ave.
Suite 4312
New Orleans, LA 70170
504-262-5985
504-262-5992 *fax*

Cert. Petr. Geol. #4014 Cert. Petr. Gphy. #02 Sipes #1271

Deborah King Sacrey
President

Auburn Energy

1342 CR 213
Weimar, Texas 78962

Office: 713-468-3260
Mobil: 713-816-1817

E-mail: dsacrey@auburnenergy.com

Cougar Dome, LLC
Geological & GIS Consulting

P. O. Box 133 Helenwood, TN 37755
www.cougardome.com

Gary G. Bible, Ph.D.
President
garybible11@gmail.com
423-215-1857

Tamia Cloud Bible, CPA
Chief Financial Officer
cfo@cougardome.com
865-617-8036

JEFFREY J. DRAVIS, Ph. D.
Applied Carbonate Geology
Regional Play Evaluation
Core Studies • Reservoir Zonation
Depositional Models • Porosity Evolution
In-House and Field Carbonate Seminars
WEBSITE: www.dravisinterests.com
(713) 667-9844

THUNDER EXPLORATION, INC.

Walter S. Light, Jr.
PRESIDENT
PETROLEUM GEOLOGIST

P.O. BOX 541674
HOUSTON, TEXAS
77254-1674

US MOBILE: +713 823 8288
UK MOBILE: +44 (0)794 755 1693
EMAIL: wthunderx@aol.com

METAROCK LABORATORIES

2703 Highway 6 S, Suite 280A
Houston, TX 77082
Tel 713-664-7916
Cell 832-287-8320
Fax 832-415-0358
zach@metarocklab.com
www.metarocklab.com

Zach Arasteh
Business Manager

Jonathan R. Rotzien, Ph.D.
President

Basin Dynamics, LLC
Global geoscience solutions

(650) 862-0574
JonRotzien@BasinDynamics.com
www.BasinDynamics.com

SEIMAX TECHNOLOGIES

Robert D. Perez
Senior Marketing Representative

4805 Westway Park Blvd., Houston, TX 77041
p: 832.554.4301 d: 832.554.4315 c: 281.787.2106
rperez@seimaxtech.com

PALEO CONTROL, INC.
WWW.PALEOCONTROL.COM

LOYD TUTTLE
Gulf Coast Paleontology

713-849-0044
ltuttle@paleocontrol.com

P.O. Box 41751
Houston, TX 77241

Powell XPloration LLC

Integrated Prospect Generation, Regional Mapping,
Sequence Stratigraphy, Property Evaluations
US Onshore and Gulf of Mexico

Tim Powell
Timp854@gmail.com
832-217-5650

3429 Tahoma Trail
College Station, Tx 77845

EDUARDO (ED) GONZALES
PETROLEUM GEOSCIENTIST

P.O. BOX 112843
CARROLLTON, TEXAS 75011
PHONE: 214-274-3039
FAX: 214-739-4458

ETROLERO, LLC

CPG #3454 - AAPG #2903 - SIPES
www.petrolerollc.com email: ed.g@petrolerollc.com
PROSPECTING, CONSULTING, OPERATIONS, GEO-TECH

Nomad Geosciences LLC
Geology - Petrophysics - Geophysics
www.NomadGeosciences.com
11429 Purple Beech Drive
Reston, VA 20191-1325

Al Taylor - President & Chief Scientist
E-mail: Al@NomadGeosciences.com CPG, LPG, RPG

Prospect Generation, Exploration and Development, Acreage Evaluation, Reservoir Characterization and Consulting Services

Voice/Fax: 703.390.1147 Cellular: 703.489.8787

PEREGRINE PETROLEUM

Larry Miller
Vice President
Business Development

2929 Allen Parkway, Suite 3100
Houston, Texas 77019

Tel: 713-630-8970
Cell: 281-467-9170
Fax: 713-630-8981
lmiller@peregrinepetroleum.com

Steve Cossey
Chief Geoscientist

Cossey & Associates Inc.
geoconsulting

P.O. Box 1510
Durango, CO 81302, U.S.A.
phone/fax: +1 (970) 385-4800
e-mail: cosseygeo@aol.com
web page: www.cosseygeo.com

Specializing in Deepwater Clastics:
- Reservoir modeling
- Analogue Studies
- Field Courses
- Databases

Nov 2003

PALEO CONTROL, INC.
WWW.PALEOCONTROL.COM

JIM THORPE
Gulf Coast Paleontology

713-849-0044
jthorpe@paleocontrol.com

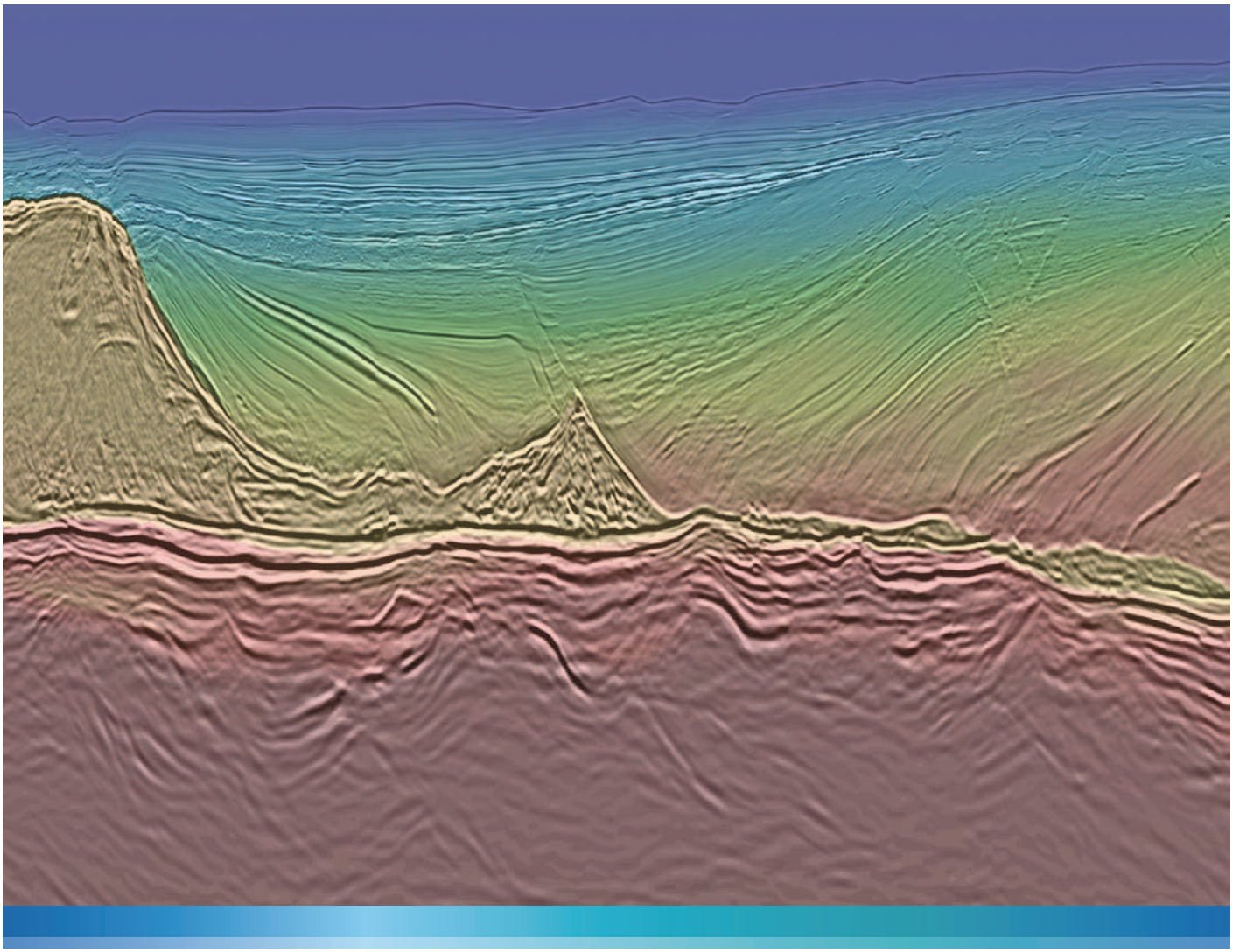
P.O. Box 41751
Houston, TX 77241

Howard White Sedimentology, LLC
Core Description, Petrography
Clastics Consulting & Field Trips

Dr. Howard White
281-682-0642
howardwhite@centurytel.net

Texas State Geol. #2096 CPG #5624

Renew Your HGS Membership
www.hgs.org



Santos Basin

Brazil – Santos Vision Area 1

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

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

Please contact: brazilinfo@pgs.com

HOUSTON
GEOLOGICAL SOCIETY
14811 St. Mary's Lane, Suite 250 • Houston, TX 77079