HGS Bulletin
Houston Geological Society
Volume 58, Number 1
September 2015

Ken Eisenmenger
GCAGS All-Convention
Luncheon Speaker

HGS hosts GCAGS 2015!
Pages 14 & 59-63

Recent Progress in Understanding the Mesozoic Opening of the Gulf of Mexico
Page 17

World Oil Supply in Transition
Page 23

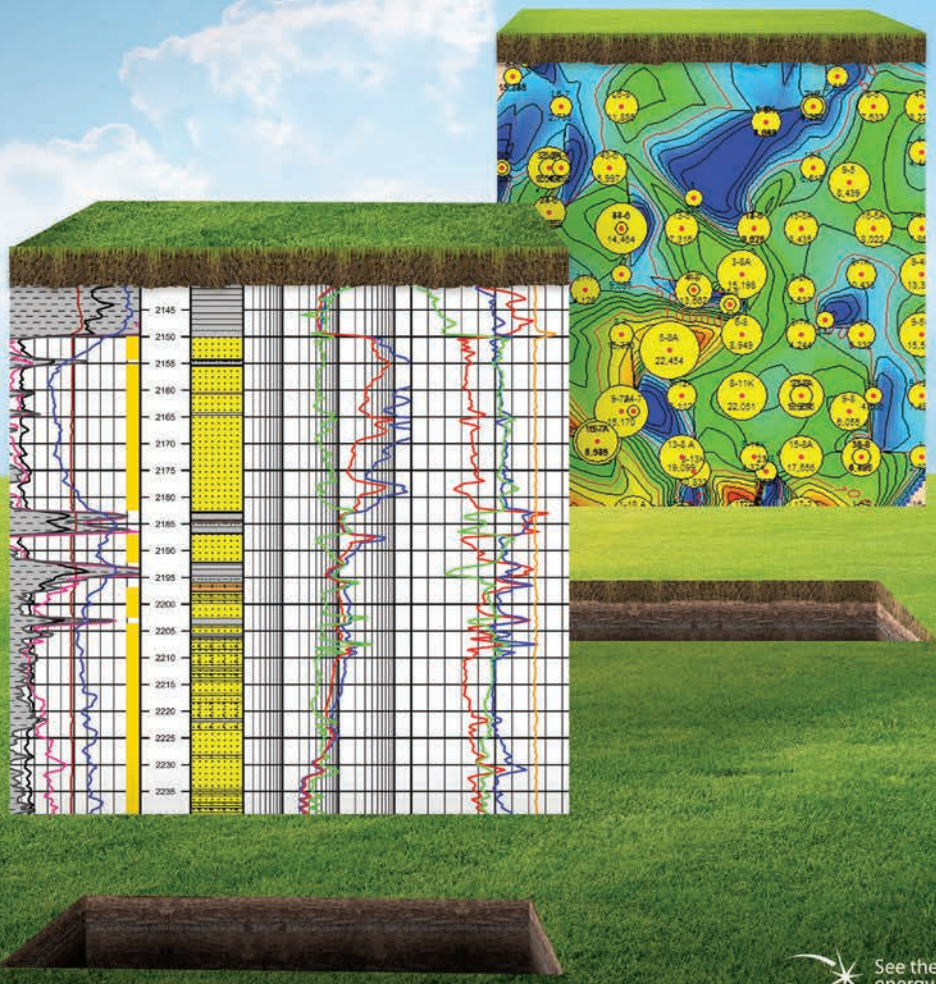
SEE THE ENERGY

U.S. SMART RASTERS AND WELL PERFORMANCE DATA

TGS offers a cost effective way for oil and gas companies to quickly identify and evaluate new prospects across the country.

- Nationwide well header/identification data for more than four million well records
- Depth-registered (smartRASTER®) log images and standard images from more than six million logs
- Detailed US production volumes for approximately 2.1 million wells
- Use of TGS Longbow™, a search and visualization tool

For more information, contact TGS at:
Tel: +1 713 860 2100
Email: info@tgs.com



WWW.TGS.COM

TGS See the energy.

The Bulletin
Houston Geological Society

Volume 58, Number 1 September 2015

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 jonblickwede.hgs@gmail.com.

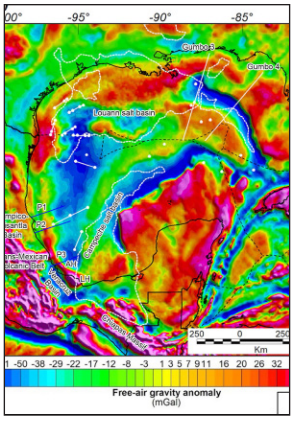
Subscriptions: Subscription to this publication is included in the membership dues ($28.00 annually). Subscription price for nonmembers within the contiguous U.S. is $50.00 per year. For those outside the contiguous U.S. the subscription price is $75.00 per year. Single-copy price is $8.00. Periodicals 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

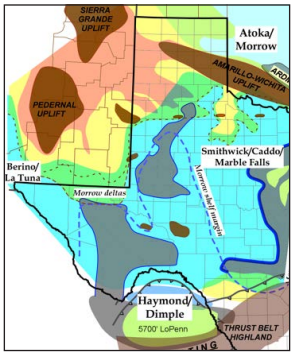
Technical Meetings

Other Features

page 15, 59-63



page 17



page 29

page 46

About the Cover: Chevron's Jack/St. Malo Floating Production Unit in Walker Ridge protraction area, deepwater U.S. sector of the Gulf of Mexico. Photo courtesy of Chevron,

Board of Directors 2015–16

President (P) Deborah Sacrey	Auburn Energy	713-468-3260	dsacrey@auburnenergy.com
President-Elect (PE) John Jordan	Anadarko	832-636-2471	John.Jordan@anadarko.com
Vice President (VP) Cheryl Desforges	Consultant	713-594-5648	Cheryldesforges@hotmail.com
Secretary (S) Gulce Dinc	ION Geophysical	713-231-2803	gulcedinc@iongeo.com
Treasurer (T) Larry Quandt	CoreLab	713-206-0389/281-685-6221	lquandt777@gmail.com
Treasurer Elect (TE) Bryan Guzman	Ingrain Inc.	832-270-5842	bryanguzman85@gmail.com
Editor (E) Jon Blickwede	Statoil	832-228-6593	jonblickwede.hgs@gmail.com
Editor-Elect (EE) Tami B. Shannon	Consultant	361-563-2523	tami.shannon.biz@gmail.com
Director 15-17 (D1) Annie Walker	ION Geophysical	832-854-6989	Annie.Walker@iongeo.com
Director 14-16 (D2) Penny Patterson	ExxonMobil	713-553-8779	Penny.E.Patterson@ExxonMobil.com
Director 14-16 (D3) Jim Grubb	White Marlin Oil & Gas LLC	713-591-1155	jamesmgrubb@yahoo.com
Director 15-17 (D4) Justin Vandenbrink	Weatherford Inc.	832-205-4063	justin.vandenbrink@weatherford.com

Committee	Chairperson	Phone	Email	Board Rep.
AAPG House of Delegates	Justin Vandenbrink	832-205-4063	justin.vandenbrink@weatherford.com	P
Academic Liaison	Germaine Johnson	832-486-2791	germaine.p.johnson@conocophillips.com	D2
Advertising	Jill Kimble	713-463-9476	jill@hgs.org	E
Africa Conference	John Jordan	832-636-2471	John.Jordan@anadarko.com	P
Applied Geoscience Conferences	Frank Walles	832-472-8496/713-825-6136	Frank.Walles@bakerhughes.com	P
	Mike Cameron	713-496-6458	mcameron@hess.com	P
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
Continuing Education	Thom Tucker	281-413-0833	century@flash.net	D1
Deep Water Technology	Justin Vandenbrink	832-205-4063	justin.vandenbrink@weatherford.com	D4
Earth Science Week	Sharon Choens	713-320-1792	Sharon.choens@sjcd.edu	D2
Educational Outreach	Jennifer Burton	832-607-0074	jlbgeo@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	Bryan Guzman	832-270-5842	bryanguzman85@gmail.com	D3
Field Trips	Ken Thies	713-598-0526	kenthies.kt@gmail.com	D1
Finance	Sameer Baral	440-708-8318	sameer.baral@gmail.com	T
Foundation Fund	John Adamick	713-816-9202	john.adamick@tgs.com	PE
General Meetings	Cheryl Desforges	713-594-5648	Cheryldesforges@hotmail.com	VP
Geomechanics	Heather Davey		heather.davey@wintershall.com	P
	Lans Taylor		lxtaylor@repsol.com	P
Golf Tournament	Mark Dennis	281-494-2522	mdennis@petrolog.com	D4
Government Affairs	Henry Wise	281-242-7190	hmwise@yahoo.com	D4
	Arlin Howles	281-753-9876	tidenv@yahoo.com	D4
Guest Night	Charles Sternbach	832-567-7333	carbodude@gmail.com	D4
HGS New Publications	VACANT			D1
HPAC	Shirley Gordon	832-289-0796	sggordon@msn.com	S
Imperial Barrel	Shawn Kushiyama	713-857-9958	shawn.kushiyama@shell.com	D2
International Explorationists	Steve Getz	713-304-8503	sgetz@sbcglobal.net	VP
	Sharma Dronamraju	713-503-5011	CEO@akdpsi.com	VP
Legends Night	Deborah Sacrey	713-468-3260	dsacrey@auburnenergy.com	P
Membership Growth	Phil Padgett		phil_padgett@yahoo.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		jmcombes@msn.com	D2
NeoGeos	Sean Kimiagar	817-727-6424	seankimiagar@gmail.com	D3
Nominations	Ken Nemeth	832-854-6989	knemeth@slb.com	EE
North American Explorationists	Donna Davis	832-517-7593	geology@texas.net	VP
	Bob Wiener	832-978-8123	rwiener@sbcglobal.net	VP
Northsiders	Sydney Mitchelle Weitkunat	281-433-1226	sydney.weitkunat@colorado.edu	VP
	Ian McGlynn	713-471-0576	ian.mcglynn@bakerhughes.com	VP
Office Management	Christina Higginbotham	281-620-7835	christina.hgs@att.net	PE
Science and Engineering Fair	Mike Erpenbeck	832-418-0221	mike.erpenbeck@hotmail.com	D2
Skeet Shoot	Tom McCarroll	713-419-9414	tom_mccarroll@yahoo.com	D4
Social Media	Dianna Phu	281-236-3131/713-589-2362	hgs.socialmedia@gmail.com	D3
Tennis Tournament	Sharma Dronamraju	713-503-5011	CEO@akdpsi.com	D4
Vendor's Corner	Rich Germano	832-647-5630	rgermano@fastenergydata.com	TE
Video Committee	Linda Sternbach	281-679-7333/832-567-7337	linda.sternbach@gmail.com	D3
Volunteer Coordinator	VACANT			P
Web Management	Linda Sternbach	832-567-7337/832-567-7337	linda.sternbach@gmail.com	D3
HGS Office Director	Andrea Peoples	713-463-9476	andrea@hgs.org	
HGS Administrative Assistant	Jill Kimble	713-463-9476	Jill@hgs.org	
HGS Web Content Manager	Brittany Davis-Morris	713-463-9476	BDM@hgs.org	

It's Time to Renew Your HGS Membership

Your membership expired June 30, 2015

Annual dues are only $28.00
Emeritus members pay $14.00 • Full-time students free

Check your email for a reminder notice and renew online at www.hgs.org

Alternately, you may fill out this form and return with your remittance—include your CURRENT EMAIL (important)

Name: _____

Member No.: _____ Type: Active__ Associate__ Emeritus__ Full-time Student__

Current Email: _____

Preferred Address for HGS mail and *Bulletin*:

_____

City: _____ State: _____ Zip Code: _____

Phone: _____

This is my home address _____ business address _____

Annual dues ($28) for the 2015–2016 year: _____

Scholarship Contributions — Calvert: _____

HGS Foundation — Undergraduate: _____

TOTAL REMITTANCE: _____

Send check and form to: HGS Office, HGS Membership Renewal, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079
or fax this form with credit card number to 281-679-5504

PAYMENT

Check # _____

Credit Card number and type: _____

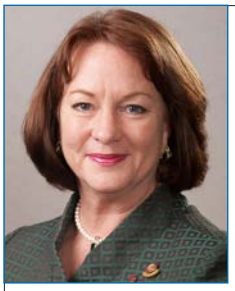
Expiration Date (required): _____ **CVV code (required):** _____

Name on Credit Card: _____

Daytime Phone number of Card Holder: _____

Billing Address for Card: _____

City, State and Zip: _____



Deborah Sacrey
dsacrey@auburnenergy.com

Support the GCAGS

Welcome everyone to another great year for the Houston Geological Society membership. We have exciting events for everyone this year starting with the GCAGS Convention this month. Of course we have exciting HGS events for September as well.

You will find that I subscribe to the "Marlon Downey School of Short President's Pages," and, in fact, will be asking several of the Board members this year to put their thoughts in this space, rather than hearing from me all year. Hence, we have renamed this column *Your Board in Action*.

However, this being the inaugural column, I will step in and encourage everyone to sign up for the GCAGS Convention being held the 20th-22nd of September at the George R. Brown Convention Center. The HGS is the sponsoring organization, and, as such, have put a full court press in making this the best offering ever.

Larry Bartell has done an excellent job of putting together a list of volunteers to organize what could be the best technical and entertainment program we have seen at a GCAGS Convention in a long time! With **Charles Sternbach** holding court as GCAGS President, and **Linda Sternbach** in charge of the technical side of the convention, it should be a wild success! **Richard Ball** has organized a fun event at St. Arnold's Brewery, and **Sally Blackhall** has cool stuff in the Hospitality Suite, which is available to all attendees, not just spouses.

The only one not having as much fun is **Jeff Lund**, who is our premier money raiser. Understandably, with product prices being low, finding sponsors has been tough for Jeff, but he has done an excellent job, given the circumstances.

With this in mind, I would like to appeal, on Jeff's behalf, to those companies who have turned him down saying "I am laying off people, so why would I be a sponsor?" Sponsorship does not have to be in large amounts! One thing a company is doing when they offer to sponsor, is help bring technology to unemployed or under-employed geoscientists perhaps the very people they have had to cut. The GCAGS Convention is a great place to network, learn new technologies, and reconnect with people from all over the Gulf Coast and beyond. What would be wonderful is if the companies would actually "treat" their former employees who have been terminated to a registration! In fact, for anyone out there – if you know of a geoscientist who is struggling due to being terminated – and you have a good job, please treat them to a registration! Sponsors also get a lot of recognition, regardless of how much you have given. If you'd like to see your company get the recognition it deserves, sponsorship is one way to get there.

The GCAGS is offering reduced rates for courses and field trips to help those who are not working right now… but they have to register to take advantage of those subsidies, which may be more than they can afford. It would be a wonderful "gift" to register a friend or a fellow ex-workmate for the convention this month, and it is not too late to do so!

Also, Jeff is not just looking for the BIG dollars. Contributions of any size are always welcome – as there are so many activities that need financial assistance. It all adds up – and it all helps! Something as small as $500 or $1000 can purchase extra food for the Hospitality Suite, or even a few extra gallons of coffee for the Convention floor. The price of coffee from the vendor for the Convention, with tax and extras is running about $121/gallon! That is equivalent to $5082/barrel… maybe we are in the wrong business. But this is just one example of the costs associated with putting on this convention, and why it is necessary to get ample sponsorship to cover the various events and amenities. They are trying to keep the costs down for registration as much as possible… so small sponsorship amounts DO help!

So if you have turned down Jeff in the past, give him a call and offer to help our fellow geoscientists have access to great technology and networking opportunities. Who knows, in a small way, you may be helping them find a replacement job.

In closing, I will say I am working with some wonderful people on the Board this year. We have several "YP's" (Young Professionals) on the Board, and there is already a difference in energy in the air. Everyone is aware of budget constraints, but no one is complaining, just looking at ways they can make a difference – so it should be a very fun year.

Looking forward to seeing all of you at one or more HGS functions this year! *Deborah*

The 15th HGS-PESGB Conference on African E&P

September 12-14, 2016 • Houston Texas

Exhibitor/Sponsorship Form

Company _____

Contact _____

Address _____

_____

City State/Province Postal Code Country

Phone _____ Fax _____

Email _____ Web Site _____

Exhibitors: With the purchase of a 10 X 10 space you will get one table, 2 chairs and a waste basket.

You will receive 2 exhibitor passes good for admittance to the exhibit hall only.

EXHIBIT SPACE ORDER $1900.00 per 10' X10' booth space: _____ booth(s) = $_____

Contact Andrea Peoples at the HGS office for booth selection 713-463-9746 Booth # _____.

Do you require internet access at your booth? ☐ Yes ☐ No

Do you require electricity at your booth? ☐ Yes ☐ No

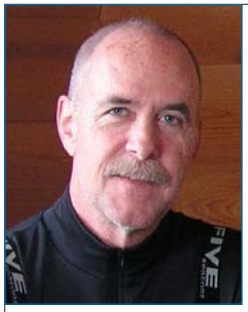
(You must purchase electricity from the hotel, HGS will send out the required form)

SPONSORSHP OPPORTUNITIES				
Tanzanite	Ruby	Sponsorship Opportunities	Actual Cost/300 Guests	Sponsorship Amount
$10,000	$5,000	Lunch – Day One	$15,000	
$10,000	$5,000	Lunch – Day Two	$15,000	
$9,000	$4,500	Day One Reception – 2 Drinks plus Food	$11,000	
$9,000	$4,500	Day Two Reception – 2 Drinks plus Food	$11,000	
$5,000	$2,500	CD of Extended Abstracts	$5,000	
$5,000	$2,500	Meeting Room Rental	$5,000	
$5,000	$2,500	Technical Session	$5,000	
$5,000	$2,500	Breakfast Day One	$12,000	
$5,000	$2,500	Breakfast Day Two	$12,000	
$5,000	$2,500	AV Equipment and Services	$25,000	
$5,000	$2,500	Am & PM Break Food & Beverage Day One	$5,000	
$5,000	$2,500	Am & PM Break Food & Beverage Day Two	$5,000	
$2,500	$1,250	Poster Gallery	$2,500	
$2,500	$1,250	Delegate Bags	$2,500	
$1,000	$500	Speaker Gifts	$3,000	
$1,000	$500	WIFI	$2,000	
$1,000	$500	Conference Signage	$3,000	
$1,000	$500	Printing Proceedings Catalogue	$10,000	
$500	$250	Note Pads, Pens	$1,000	
$	$	General Fund – You fill in the amount		
			Booth Space + Sponsorship TOTAL $	

Mail completed form along with your check made out to: HGS: 2016 Africa Conference Exhibit/Sponsorship
Houston Geological Society • 14811 St. Mary's Lane, Suite 250 • Houston, TX 77079 USA

Credit Card Option: To pay by credit card contact the HGS Office +1 (713) 463-9476

Questions: HGS Office Telephone: +1 (713) 463-9476; Fax: +1 (281) 679-5504; Email: office@hgs.org



Jon Blickwede
jonblickwede.hgs@gmail.com

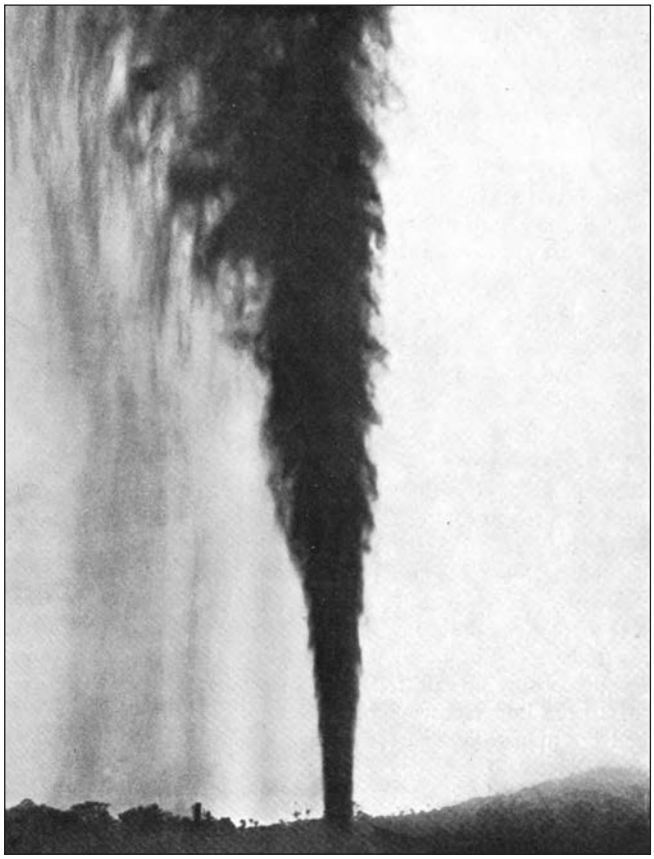
The Greatest Oil Well in History

It was a big early 20th century gusher… but it wasn't the famous Spindletop well drilled in 1901 near Beaumont, Texas, or even any of the many super-prolific oil wells of the Middle East.

Welcome to the first of my *From the Editor* columns. It's about a piece of oil industry history which I hope you'll find inspiring, as it has been for me. Inspiration is one of the themes I have decided to use for my allotted ten columns for the 2015-16 HGS *Bulletin*. Inspiration is something we all seek, both in our personal and professional lives. It is a primary force that ignites and sustains our passions, and I think it's worth remembering that one of the definitions of inspiration is "the act of breathing-in."

The Greatest Oil Well in History is a story mostly forgotten, as it lay hidden for some 70 years in the archives of my first employer Amoco Production Company. During the 1990's, when I worked on a series of joint technical projects involving Amoco, Pemex and the Instituto Mexicano del Petróleo, my friend and former Amoco colleague Josh Rosenfeld found a dog-eared copy of a 1922 Pan American Petroleum & Transport Company (predecessor to Amoco) publication entitled *Mexican Petroleum* in a dusty corner of the company library in Houston. He decided to make a nice little reprint of a portion of it to distribute at the Amoco booth at a number of Mexican industry events. The subject of Josh's excerpt from the book was Cerro Azul #4, drilled in the Tampico-Misantla Basin of Mexico during late 1915/early 1916 by Pan American. By the way, the President of Pan American Petroleum & Transport was legendary California oilman Edward L. Doheny, whose life story inspired Upton

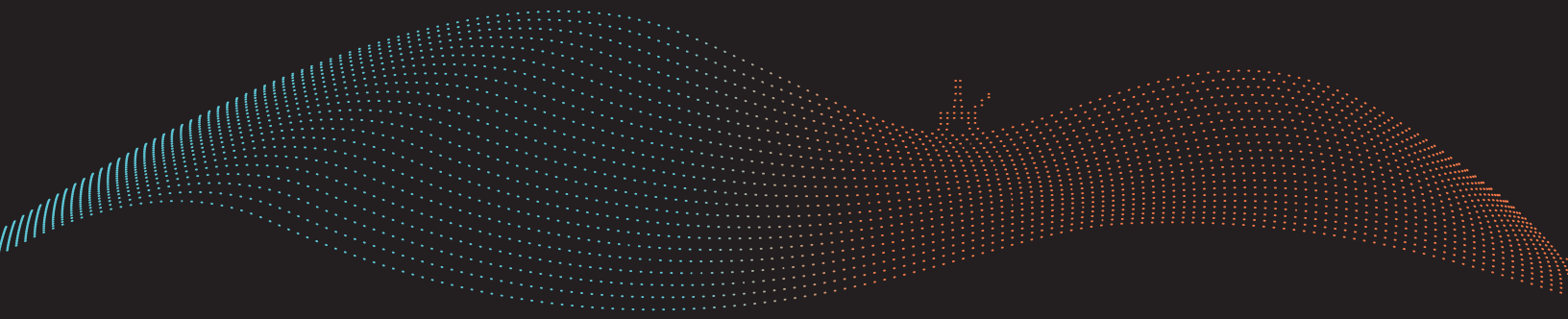
From The Editor *continued on page 9*



The well at its maximum flow before being closed in. At an estimated 598 ft, the gusher would have exceeded the height of the Marathon Oil Tower in Houston.

Valve completely over the well, only nine days after the blowout.

blueback reservoir
GeoScience Solutions Partner



BLUEBACK RESERVOIR GOES FORTH UNDER A NEW NAME

Blueback Reservoir is a renowned Geoscience Solutions Partner and Cegal a leading provider of customized IT solutions to the oil and gas industry. Together we will fill the gap between E&P and IT.

As we continue to expand our offerings in the future, we will remain best in class for geoscience expertise and software products.

Read more at cegal.com

cegal

From the Editor continued from page 7

Sinclair's 1920's novel *Oil!* and much later the 2007 Oscar-winning movie *There Will Be Blood*.

The men who closed in Cerro Azul # 4

Cerro Azul #4 was drilled with a cable-tool rig into the karstified Albian-Cenomanian rudist reef complex of the El Abra Formation, in the northwest part of an elliptical belt of oil discoveries that came to be known as the Faja de Oro (or, as it's inaccurately expressed in English, the "Golden Lane"). The well blew out on 10 February 1916 at a depth of around 1,700 feet, and wasn't brought under control until nine days later. During that nine-day period, the gusher steadily grew to around 600 feet in height, and because of high winds caused by a cold front uncommon this far south in the Gulf, much of the oil was blown up to two miles from the wellsite. Apart from the drilling tools and steel cable being shot far from the wellbore by the gusher, it was reported that stalactites and stalagmites associated with the cavernous porosity of the El Abra reservoir were ejected at high velocity along with the oil.

Pan American Chief Geologist Ezequiel Ordóñez

Because of the great quantity of oil flowing uncontrolled from the well, an attempt was made to collect as much of it as possible by digging a series of trenches away from the wellsite leading into surface pits. The volume of oil could then be calculated by measuring its flow rate through the trenches along with the width and depth of the flow. By this means, Cerro Azul #4 was estimated to have reached a flow rate of 260,858 barrels per day (not taking into account the oil blown away from the gusher in the wind) on the day before it started to be brought under control. This (minimum) estimate far outstrips the maximum recorded flow rate of any other individual well, anywhere in the world.

It should be emphasized that, although Doheny led the company that drilled Cerro Azul #4, the great discovery would not have been made were it not for the informed optimism, persistence, and belief in the oil potential of the Tampico region by Pan American's Chief Geologist Ezequiel Ordoñez, now regarded as one of the giants of the Mexican petroleum industry.

There are many other fascinating details of the Cerro Azul #4 story, such as the fact that it took only nine days for the wellsite crew to bring the blowout under control, despite having to forge on-site some of the components of the valve assembly. Perhaps most amazing of all is that Cerro Azul #4 is still producing today, or at least as of the early 2000's when the last accompanying photo was taken. The entire story of the birth of this world champion can be found in the aforementioned 1922 publication *Mexican Petroleum*, available on the web at Google Books.

At least one question naturally arises: was Cerro Azul #4 the global extreme outlier, never to be repeated? Or could there be any analogues out there still waiting to be discovered, perhaps by you and your team? Without the gusher, of course… ■

Cerro Azul # 4 in the early 2000's

Outstanding Student Awards

Each year, the Houston Geological Society recognizes outstanding students from area universities. Students are selected for recognition based on nomination by their faculty. HGS awards each outstanding student with a $500 prize, publication of their biographical sketch in the HGS Bulletin*, and a plaque, all to be presented at the October HGS General Dinner Meeting. This year, the following students have been selected by faculty and HGS for outstanding academic achievements and contributions to geology.*

Adeene Denton

Rice University

Adeene describes the origins of her passion for geology: "Spending time in Colorado when I was a kid meant dragging my family to rock shops and expeditions to nearby caves. While it took until college to realize that earth science was my passion, in reality it has always been a part of my life. Not every child names their pets after rocks and minerals, as I did."

Adeene's geology field camp was in Nepal, where she trekked through the Annapurna region studying metamorphic petrology, geomorphology, and glaciology. This past summer, Adeene worked at the Lunar and Planetary Institute, an affiliate of NASA, studying faults related to the meteorite impact at Meteor Crater, Arizona.

At Rice, she is President of RUGS, the Rice Undergraduate Geosciences Society, which she co-founded in 2014. RUGS was established to help Earth Science undergraduates at Rice form a community, as well as to help prepare them for graduate school or industry employment. ■

Meagan DePugh

Sam Houston State University

Meagan just completed her undergraduate program at Sam Houston State University, having graduated with a B.S. in Geology this summer. This is the second time Meagan has been honored with an HGS Outstanding Student Award, having also won in 2014. She was most recently the events coordinator in both the Sam Houston Association of Geology Students and Sam Houston's AAPG Student Chapter, and she also served as a teaching assistant in the Geology Department for the physical geology and hazards labs. In addition to teaching, Meagan assisted in undergraduate research with Dr. Patrick Harris and Dr. Jon Sumrall. Her work done with Dr. Harris on killing ettringite formation in sulfate-bearing soils was recently published in the *Transportation Research Record: Journal of the Transportation Research Board,* No. 2462 Soil Mechanics (2014). She also recently presented her research on Barbados' chirping beach sands in March at the 2015 South Central GSA Meeting, and received an award for the best undergraduate presentation. In addition, Meagan was the recipient of the Sam Houston Association of Geology Students Scholarship award. While at Sam Houston, Meagan was named to the Dean's List for Fall 2012, Spring 2013, and Spring 2014, and named to the President's list for Fall 2012. Meagan was accepted into the graduate geology program at Texas A&M University and was scheduled to begin her studies there last month. ■

Martin Messmer

Stephen F. Austin State University

Martin is a graduate student at Stephen F. Austin State University in Nacogdoches, Texas. His thesis research focuses on detailed geologic mapping and structural analysis in the Ouachita Mountains of Arkansas. Prior to entering Stephen F. Austin, Martin earned a Bachelor of Science degree in Geology and Environmental Geosciences in 2007 from Northern Illinois University. He is a member of the Shreveport Geological Society and AAPG. ■

Louis Quinones

Texas A&M University

Louis will graduate in the Fall of 2015 with a B.S. in Geophysics, and has been one of the top students in the Texas A&M program throughout his academic career. His primary geophysical interests are in seismology, from the study of earthquake wave propagation, to near surface data acquisition. In Summer 2015, Louis participated in the highly competitive IRIS Summer Internship Program, working on an independent seismology research project. After having graduated from A&M, Louis has been considering the options of continuing on into graduate school as well as possible employment with a geophysical exploration or geological consulting firm. ■

Outstanding Student Awards *continued on page 13*

Outstanding Student Awards continued from page 11

Kurt Sundell
University of Houston

Kurt is a second year Ph.D. student at the University of Houston working under the advisement of Dr. Joel E. Saylor. His primary interests are tectonics and sedimentation, and enjoys using a variety of stratigraphic, as well as stable and radiogenic isotopic geochemical tools to understand large scale tectonic problems. Currently, Kurt is investigating a suite of intermontane basins in southern Peru in an attempt to place constraints on geodynamic models explaining the development of the Central Andean Plateau of South America. ■

Rattanaporn Fongngern
University of Texas at Austin

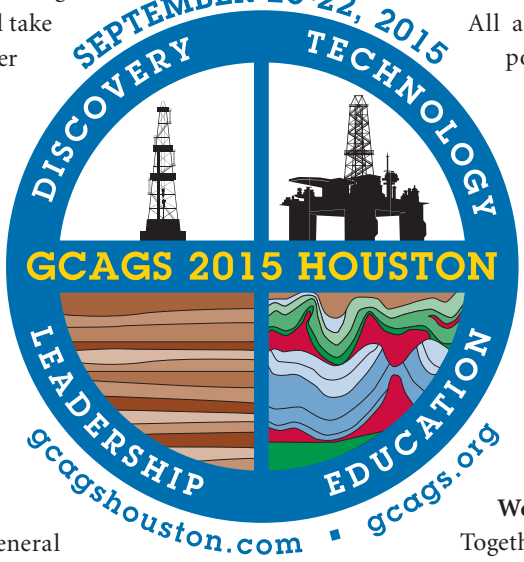
Rattanaporn is a Ph.D candidate at the Jackson School of Geosciences at the University of Texas at Austin. Prior to entering UT, she received a B.S. with honors in Geological Sciences from Chiang Mai University in Thailand. While a student there, she received a variety of awards, including the Outstanding Academic Achievement Award for 2005, 2006, and 2008, and the Outstanding Achievement Award in field of geology in 2005. In 2008, the Royal Thai Government granted her a scholarship to continue her graduate studies abroad.

Rattanaporn says that sedimentology and stratigraphy are her professional passions, and decided to specialize in deepwater depositional systems. Her Ph.D research focuses on a source-to-sink system within the Dacian Basin in Romania, under the supervision of Dr. Ron Steel and Dr. Cornel Olariu. She has received a Postgraduate Research Grant from the International Association of Sedimentologists in 2013, and won 2nd place for Best Late Career Ph.D Research Award at the Jackson School Annual Research Symposium in both 2014 and 2015. While at UT Austin, she has enjoyed participating in several field seminars, including Argentina and the Svalbard region of Norway. Rattanaporn is also involved in a variety of extracurricular activities such as serving as Treasurer of the Thai Association of Austin, and since 2014 she been been coaching the Science Olympiad team of a local high school in Austin on geological topics. ■

65th GCAGS Convention
Technology, Education, Leadership, Discovery

*by **Larry D. Bartell,** 2015 GCAGS General Chairman, ldbartell@legendsexpl.com*

As you read this issue of the HGS Bulletin, you will undoubtedly note the many activities that are occurring in September and months beyond as we start a new HGS year. One of the biggest events, just a couple of weeks away, is the 65th annual Gulf Coast Association of Geological Societies (GCAGS) Convention that will take place here in Houston on 20-22 September at the George R. Brown Convention Center. The Gulf Coast Section of SEPM (Society for Sedimentary Geology) will join GCAGS and expand the breadth of expertise and subject matter in a joint convention.



For those of you who may not be aware, your HGS is an affiliated society of GCAGS, as well as the proud host society for this year's GCAGS Convention.

I have the great fortune to be the General Chairman of the convention and to work with some amazing individuals this past year in preparing for the event. We have assembled a superb technical program that is the largest in recent years with more than 90 talks to be presented in four concurrent sessions. **Linda Sternbach** has headed up this effort, with the assistance of **Meredith Faber** in arranging for a similar number of poster presentations. Tuesday's program will feature three discussion forums. The entire program, including an array of excellent pre-convention field trips and short courses, were selected with you in mind, the working Gulf Coast geologist, to provide you with an opportunity to expand your professional toolbox through new insights into the geology of the Gulf of Mexico basin.

Technical Program
Pages 59-63

Charles Sternbach, our luncheon chair, has arranged three keynote speakers whose topics are appropriate for today's oil and gas exploration environment. As has been highlighted on the cover of this issue of the HGS *Bulletin*, Karl "Ken" Eisenmenger, Exploration General Manager, Chevron Deepwater Exploration and Projects, will present "Chevron's Key Discoveries and Developments in the Deepwater Gulf of Mexico: a Story of Steady Growth" at Monday's All Convention Luncheon. Tuesday's DPA luncheon speaker is Charles Goodson of PetroQuest, will speak on "How to Survive and Thrive in Good Times and Bad." And GCSSEPM has Rob Lander, an AAPG Distinguished Lecturer, who will present a talk entitled "Model the Rock! Using Diagenesis Simulation for Rock Property Prediction."

All authors of the oral presentations and posters will publish their abstracts, extended abstracts or full papers in this year's GCAGS Transactions, which for decades has been one of the premier technical publications on the geology of the Gulf of Mexico basin. Editing of this year's volume is in the capable hands of Steve Levine and his team of fellow editors.

Hunter Lockhart has arranged an extensive slate of eight short courses, and **Dr. Julia Wellner** and **Dr. Robert Wellner** have organized seven field trips. Together, these provide excellent continuing education opportunities addressing topics of high interest to further enhance your experience at this year's GCAGS.

One of the fun things about the GCAGS is that each host Society can offer different and unique programs and activities. This year is no exception. We have coupled our activities with the popular AAPG-SEG Student Expo that is held each year for soon-to-be graduates, many of whom are from the colleges and universities within the Gulf Coast and neighboring states. This successful program has grown through the years to a current total of around 800 participants. This is a win-win opportunity for everyone as it will undoubtedly heighten the energy and enthusiasm within the convention, while providing many of the students with their first exposure to HGS and GCAGS and the potential benefits that await them in their professional careers as members of these societies. GCAGS will recognize the best student posters with awards to be presented on Monday evening at the President's Reception.

But we're not all about serious stuff – no need to mention that we Gulf Coast geologists like to have our fun – and you can count on fun being had! HGS President **Deborah Sacrey** is heading the non-technical committees, with **Richard Ball** as our entertainment chair. Richard has scheduled festivities for the Sunday Evening Icebreaker, the President's Reception on the exhibit floor on Monday afternoon, and a Monday evening event at St. Arnold's Brewery, all of which promise to be spectacular, energizing and fun.

At the President's Reception, along with recognizing and awarding the student poster winners, we will have a contest among us veteran GCAGS attendees to see who has the Oldest GCAGS Bag. So check your closets, bring them with you, and we will honor the winner with an award.

Sally Blackhall is coordinating the activities, enrichment programs, and treats for the hospitality room, which will be located in the adjacent Hilton Americas, our host hotel.

Our exhibit hall will be on the 3rd floor of the Convention Center, conveniently located near our technical sessions. **Bill Mason** has been busy signing up exhibitors, and last-minute exhibitor sign-ups are still welcomed! If you and your company would like to participate, contact Bill and he can direct you from there.

It is also not too late for sponsorships either, and to be recognized as a true friend of the GCAGS. Jeff Lund is our sponsorship chair, and he can inform you of the remaining opportunities for you to play a key role.

The participation and generosity of the exhibitors and the sponsors have been incredibly helpful, given the difficult times we are currently experiencing, in providing resources to help us continue the great programs the GCAGS has for scholarships and grants.

Dianna Phu, our webmaster, has done an outstanding job creating a new and helpful GCAGS website that incorporates social media. So I encourage you to visit it at www.gcagshouston.com for more information, and registration.

There are many other behind-the-scenes volunteers that I haven't mentioned here, without whom the convention wouldn't be possible. So a hearty thanks goes out to all of them.

Nor have I mentioned the entire line-up of activities, so I encourage you to look through our announcement brochure, visit our website www.gcagshouston.com, or contact the HGS office and they will make the necessary arrangements for you to receive a brochure.

I cannot express enough my excitement and eagerness for this year's GCAGS Convention with all of the offerings we have organized for you. Come join us and I'm sure you will be pleased as well with the opportunities for learning, sharing ideas, networking, and having fun. ■

Wednesday, September 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.

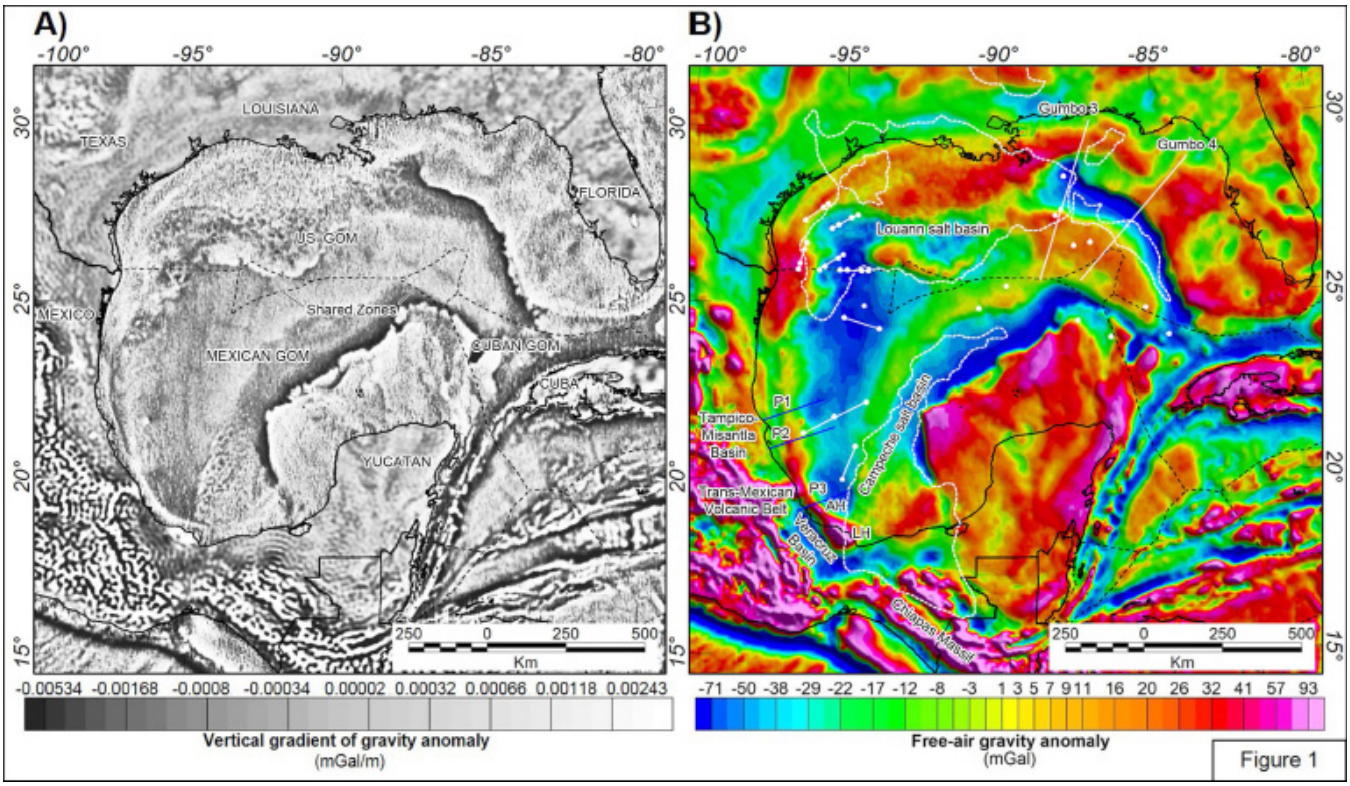
HGS International Explorationists Dinner Meeting

Paul Mann
University of Houston, Professor of Geology and Robert E. Sheriff Endowed Chair

Recent Progress in Understanding a Two-stage Opening Model for the Gulf of Mexico and its Implications for Deepwater Exploration in the US and Mexican Maritime Zones

Models for the opening of the Gulf of Mexico (GOM) will be reviewed in light of our own studies of integrated gravity and magnetic data, and interpretation of seismic reflection lines.

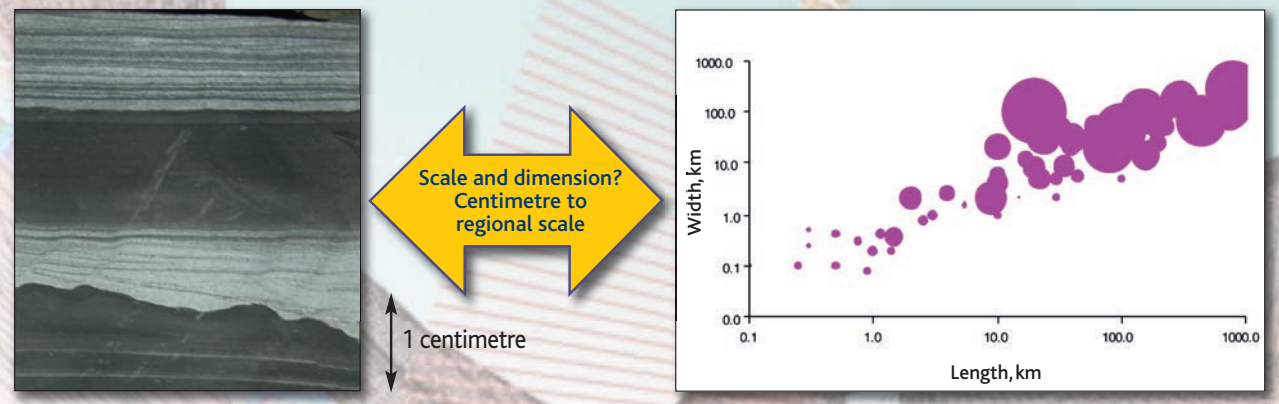
Most previous workers agree that the first phase of syn-rift GOM opening is Late Triassic-Early Jurassic (235–174 Ma) in age, NW-SE in extension direction, and responsible for creating a broad zone of thinned, continental crust along the northern margin of the GOM and underlying the northern salt basins of Texas, Louisiana and Mississippi. This Late Triassic-Early Jurassic rift zone is an along-strike continuation of Triassic rifts present along the eastern margin of North America, but in the northern GOM area these rifts failed to culminate in production of a parallel and contiguous zone of oceanic crust. Progress has been slow in understanding the early history and crustal structure of this area in the GOM due to the obscuring presence **HGS International Dinner** *continued on page 19*



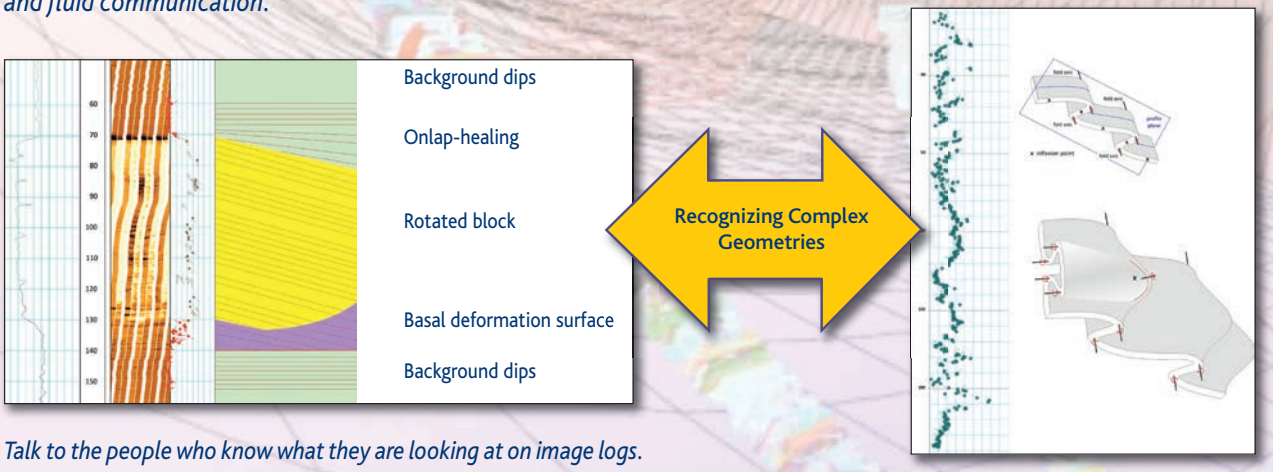
Left: *Geographic setting of the Gulf of Mexico basin (GOM) with overlay of vertical gradient of gravity anomaly from Sandwell et al. (2014) showing slightly darker, linear expression of the extinct, deeply buried, Jurassic ridge-fracture zone system occupying the center of the deepwater GOM.*
Right: *Overlay of same area showing free-air gravity anomaly also from Sandwell et al. (2014). Onshore data is derived from the EGM2008 geoid model (Pavlis et al., 2012). Dashed white outline represents now-separated areas of the Louann salt basin to the north (US side of GOM) and the Campeche salt basin to the south (Mexican side of GOM). AH = Anegada High volcanic field; LH = Los Tuxtlas volcanic field. This is from a student paper just submitted to the journal* Interpretation.

Getting into **Deep Water**

RECOGNISING MASS TRANSPORT COMPLEXES (MTC) are part and parcel of any exploration or development in continental margin, abrupt margin and submarine canyon plays. Based on hundreds of kilometres of image and cores studies, **TASK FRONTERRA** has determined that at least 12% of deep marine deposits are deformed by creep, failure or rotational slumping. We have conducted numerous studies in the Gulf of Mexico, West Africa, Brazil, West of Shetlands, Nile Delta, Australia: North West Shelf and Malaysia.



Whether you are looking to sequester CO_2 in compartmentalized sediments, or looking at field development strategies – you want to be using the people who can measure and characterize these sediments in terms of geometry, scale, contacts and fluid communication.



Talk to the people who know what they are looking at on image logs.
Talk to the people who have worked on MTC compartmentalization in fields across the globe.

A GLOBAL FOOTPRINT – OFFICES IN TEN LOCATIONS ACROSS EUROPE, NORTH AND SOUTH AMERICA, THE MIDDLE EAST AND ASIA PACIFIC. COMPLIMENTARY EXPERTISE TO ASSIST CLIENTS IN THEIR UNDERSTANDING OF MATURE RESERVOIRS, CARBONATES, DEEP-WATER FIELDS AND UNCONVENTIONAL HYDROCARBONS, ESPECIALLY SHALE GAS WITH OUR INTEGRATED SHALE GAS WORKFLOW.

TASK Fronterra GEOSCIENCE

ABERDEEN • BOGOTA • CAIRO • DENVER • HOUSTON • MIDLAND • OKLAHOMA CITY • PERTH • TULSA • VIENNA

TASK FRONTERRA GEOSCIENCE 2401 PORTSMOUTH, SUITE 280 HOUSTON, TX 77098 TEL: +1 713 634 0777

www.taskfronterra.com

HGS International Dinner continued from page 17

of an overlying sag basin of post-Early Jurassic age filled by 3–4 km of depositional salt (now remobilized).

The second and much better understood phase of GOM opening is Late Jurassic (156–145 Ma), post-salt in age and formed a large expanse of salt-free, Jurassic oceanic crust underlying the deepwater GOM shared by the U. S., Mexico and Cuba. This second opening phase occurred along a highly arcuate, slow spreading ridge system now precisely imaged on basin-wide satellite gravity maps. We have georeferenced our grid of deep-penetration seismic and well data in the eastern GOM, along with recent refraction studies, to both ground-truth these satellite images and provide details of the early breakup and separation. The eastern and northeastern GOM continent-ocean boundary defined by deep seismic profiles is within 20 km of that inferred from satellite gravity. Gravity and magnetic models are used to constrain the location and shape of the deeply-buried, Jurassic age, and right-lateral main Western Transform Fault that sharply defines the continental edge of eastern Mexico. We have used the shape of the satellite-imaged fracture zones in the central Mexican GOM along with the shape of the main Western Transform Fault to improve the pole position for this second phase of GOM opening which is located in the Straits of Florida. This pole restores trends of Paleozoic crustal fabric in Florida and the Yucatan Peninsula imaged on gravity and magnetic maps to pre-rotation parallelism, along with reuniting the now widely separated U. S. Louann salt basin and Mexican Campeche salt basin. This pole position is used to create a kinematic plate model for the second phase of GOM opening that respects all available seismic reflection, refraction, and well data, as well as satellite imagery.

Implications for deepwater exploration from this work include: 1) more precise locations of the continent-ocean boundaries in the U. S., Mexican and Cuban maritime zones; 2) the locations of passive margins overlying rifted margins versus those passive margins overlying "transform passive margins" and their consequent effects on heat flow and passive margin subsidence; and 3) the question of whether or not Upper Jurassic source rocks and petroleum systems can exist on the extensive, deepwater area of oceanic crust formed during the second stage of GOM opening.

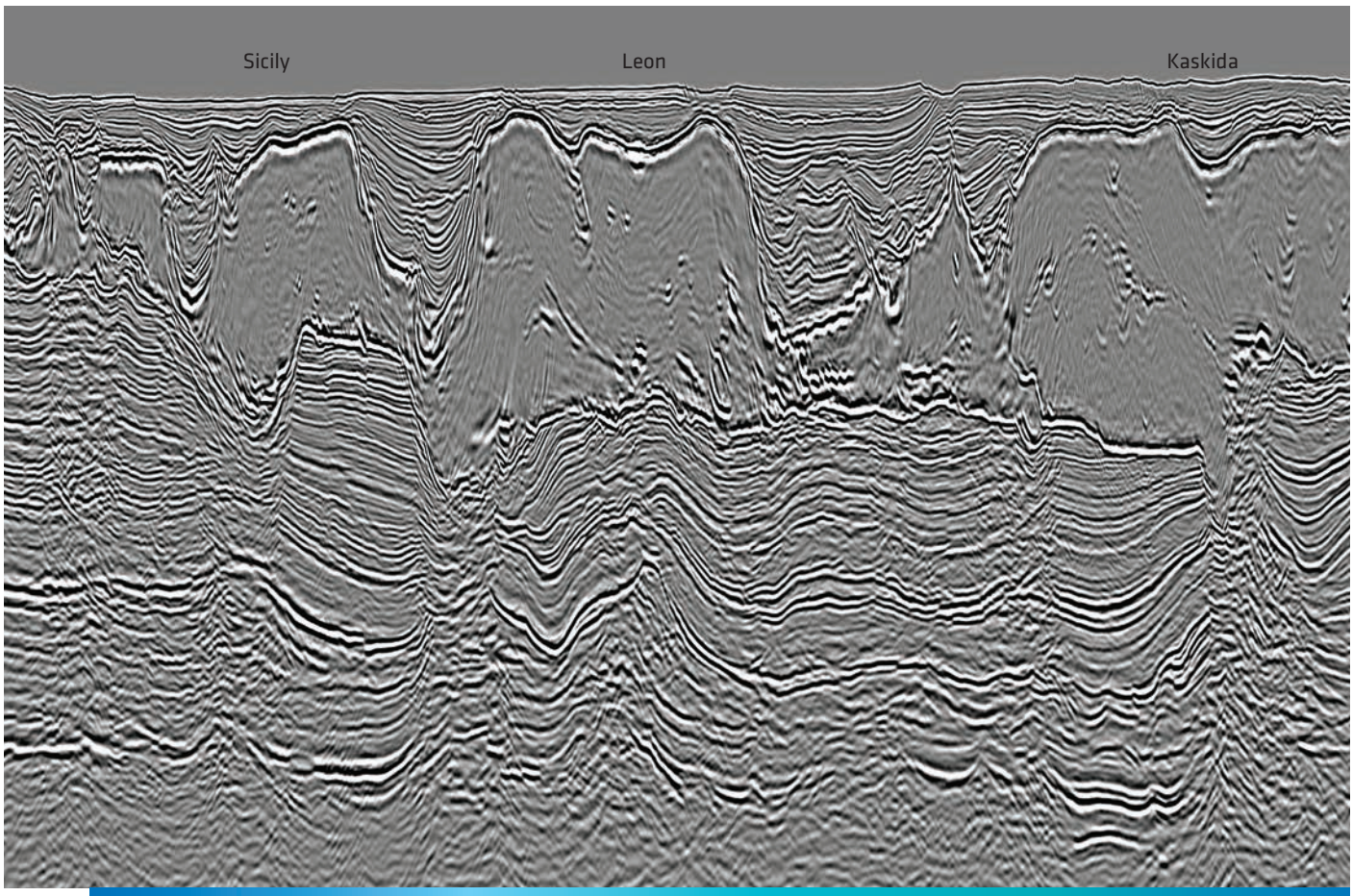
Biographical Sketch

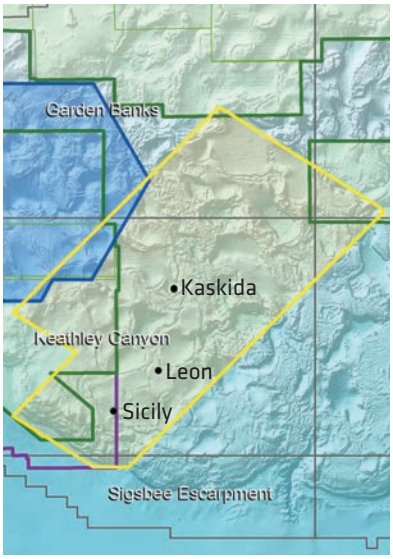
Paul Mann is Professor of Geology and Robert E. Sheriff Endowed Chair at the Department of Earth and Atmospheric Sciences of the University of Houston. He was previously a senior research scientist and lecturer at the University of Texas at Austin. He received his Bachelor of Arts in geology from Oberlin College and his Ph.D. in geology from the State University of New York at Albany. His main interests are tectonics, basin analysis, and petroleum geology. He is the principal investigator of an oil industry-funded consortium at the University of Houston called CBTH (Caribbean Basins, Tectonics, and Hydrocarbons) that conducts basin-scale mapping and modeling in the Gulf of Mexico, Caribbean, northern South America, and related conjugate margins. The project currently employs 23 University of Houston geology and geophysics students at the graduate and undergraduate level who work on a variety of research projects along with maintaining a GIS (Geographic Information System) surface and subsurface database for the CBTH study area.

References

Sandwell, D., Müller, D., Smith, W., Garcia, E., and Francis, R., 2014, New global marine gravity model from CryoSat-2 and Jason-1 reveals buried tectonic structure, *Science* , 346, 65–67.

Pavlis, N., Holmes, S., Kenyon, S., and Factor, J., 2012, The development and evaluation of the Earth Gravitational Model 2008 (EGM2008): *Journal of Geophysical Research*, v. 117, B04406, doi:10.1029/2011JB008916.





TAP UNTAPPED POTENTIAL WITH SEISMIC CLARITY

Get the clearest images in Garden Banks/Keathley Canyon

- Using high-resolution hyperTomo
- Tilted transverse isotropy (TTI) velocity model building
- Anisotropic Pre-Stack Depth Migration (PSDM) with Reverse Time Migration (RTM)
- Sub-salt imaging is greatly enhanced
- Reduce your exploration risks
- Increase your chance of success

Crystal A and B - 580 OCS Blocks - Available Now

Please contact your PGS Account Manager today
+1 281 509 8000 or gominfo@pgs.com

A Clearer Image

www.pgs.com

MultiClient
Marine Contract
Imaging & Engineering
Operations

PGS

Wednesday, September 9, 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.

David S. Bardsley, PG – TX, MO, TN, LA
Directed Technologies Drilling
david@horizontaldrill.com

Soil Sampling Utilizing Horizontal/Directional Drilling Methods

Horizontal/directional drilling (HDD) methods have been utilized in the environmental drilling industry for the installation of monitor and remediation systems. New refinements in drilling equipment, steering/locating technology and sampling tooling have given consultants, site owners and drillers the ability to use the technology to obtain soil samples using HDD technology.

The specific tooling technology includes a variety of soil samplers for use in multiple types of geologic conditions. The equipment is designed for use with small (less than 25,000 lb. capacity) drilling rigs which require a small surface operating footprint.

Benefits of the method include:

- Accessing areas under obstructions limiting or preventing the use of vertical drilling equipment.
- Steerable drilling assembly allows for multiple samples from one borehole or rig up location.
- Bore entry point can be located in areas where overlying formations are not contaminated, eliminating the potential for cross-contaminating vertical formations.
- Reduce crew risk by moving the drilling equipment from hazardous locations; e.g., busy roadways, ponds and manufacturing-operating units.

Several recent projects detailing the effectiveness of horizontal/directional soil sampling operations will be examined, including sampling beneath a river, sampling beneath a waste storage lagoon, and sampling beneath a landfill. ■

Biographical Sketch

David Bardsley has over thirty-one years of water supply/environmental drilling experience working in a variety of settings across the United States. He started his career as a drill rig helper advancing through various technical and managerial positions in both small and large companies. He is familiar with all of the drilling techniques utilized in the industry including; auger, air/mud rotary, casing advance, sonic, dual tube, direct push and wireline coring. He was an early leader in the use of horizontal drilling to solve environmental challenges and has authored/co-authored over twenty papers on horizontal environmental drilling methodology. David has been directly involved in the design and installation oversight of over 100,000' of horizontal environmental wells including seventy-six blind well completions. Mr. Bardsley has a Bachelor of Science degree in Geology & Geophysics along with a Communications Minor (1984) from the University of Missouri-Rolla. He is a licensed well driller in Texas, Arizona and Louisiana and holds RG/PG certifications in Texas, Missouri, Louisiana and Tennessee. Mr. Bardsley is a strong proponent of education and has served as a short course instructor at Battelle environmental conferences and University of Wisconsin Madison along with presenting environmental drilling training to students at University of Arizona and University of Louisiana at Lafayette.

Monday, September 14, 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

Richard S. Bishop, Wayne L. Kelley
RSK [UK] Limited, Houston
www.rskuklimited.com

World Oil Supply in Transition

The world is not running out of oil, but there is concern about long term supply rate.

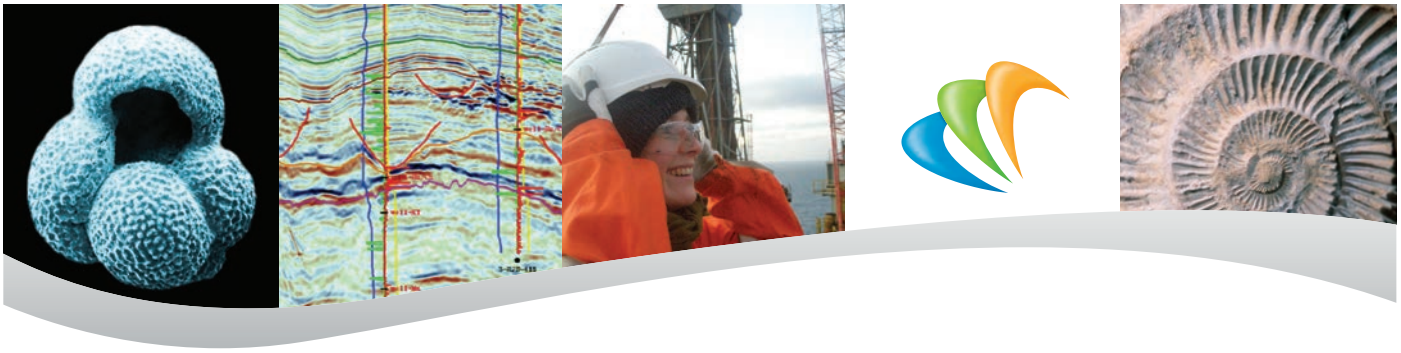
Historically, estimates of global oil supply have been based on a combination of resource volume and forecasted demand. The price was driven largely by the giant and super-giant conventional fields and reflected a rough parity of cost between the cheapest and most expensive producer. Today, the relatively low cost oil coming from the biggest conventional fields is no longer sufficient to meet global demand. Consequently, forecasting supply and price has been complicated by the wide range of costs, technological improvements and changes in the market. In an open market scenario the price of oil is determined by the sale of the most expensive oil needed to make up the total supply. However, traders are divided between those that perceive the market being determined by supply and those that see it as being a derivative of the macro-economy. Today, we see an uneasy equilibrium between these two determinants of price, with a probability of increasing price volatility as the character of supply moves from a more homogenous past of rough parity of costs to a lumpier one with disparate project economics. The combination of technology and increased price has added large volumes to the reserve base but much of these additions are high cost oil which is at the highest risk in the event of price declines.

Forecasting oil price is not yet a "settled science," but our look at the transition includes consideration of:

- *Shut in capacity:* excess production capacity has shrunk from 15 million bopd in the 1980's, to around 4 to 6 million bopd in the last decade, to perhaps as low as 2 to 3 million bopd today. This means that global oil supply is evolving from one with flexibility to one characterized by "just in time." The impact on price driven by demand instead of low cost will become more significant as excess supply shrinks and low cost production cannot be expanded.
- *Reserve addition/ increasing production:* The cost to add new production ranges from approximately USD $25 billion per million bopd to over USD $50 billion per million bopd. We estimate that the giant and super-giant fields (i.e., the low cost producers) are approximately 50 percent depleted and significant expansion of their production rate is unlikely. Furthermore, even though global reserve volumes have grown, the time and cost to add production has increased significantly.
- *Logistics:* Industry has limitations as to how fast new production can be added, particularly from complex new resources. In addition, high cost oil resources require significant changes in transportation and refining infrastructure.
- *Capital:* the increased cost obviously means one is investing in the higher cost asset, not the lowest. Furthermore, there is increasing risk of political intervention in all areas of production.
- *Politics:* unstable States, sanctity of contract and access to resources are increasingly significant concerns and limitations.
- *Macro-economics:* Exporters of low cost oil are the primary beneficiaries of increased price. An unseen side effect of the transfer of wealth from importers to exporters has been to increase the fragility of the global financial system. The EIA estimates that over USD $500 billion per year is flowing into the Persian/Arabian Gulf region which, especially when leveraged, can impact the global financial stability. This transfer will continue due to the unabated increase in the demand for work performed by oil and the value of the US dollar.
- *Optimizing oil price:* exporters will seek to maximize their profits but may also cause global economic restrictions thus reducing demand and increasing price volatility.

These changes have become more significant within the last decade and the consequences are beginning to emerge. The most visible is the tightening of excess supply and its vulnerability to interruption. This tightening is not likely to ease, due to the high cost of adding new supply, limitations of low cost production, and lack of incentive for low cost producers to increase production. Nonetheless we have much lower prices today apparently due to increased sensitivity of price to multiple conditions and not just supply and demand. The implication of these trends is a long term upward pressure on the cost of oil supply which can only be supported with appropriate price. ■

HGS General Dinner *continued on page 25*

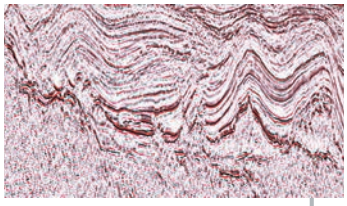


Robertson

Core Strengths

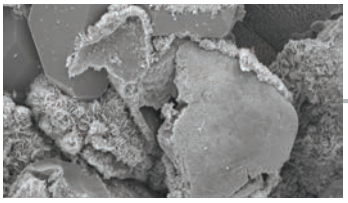
Geological solutions to geophysical challenges

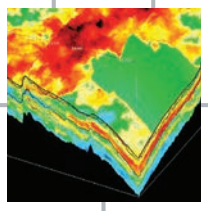
Structural Geology



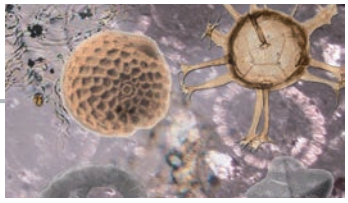
Geochemistry

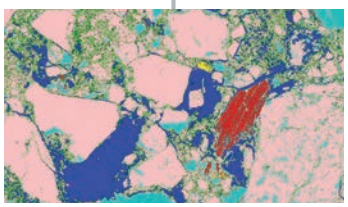
Sedimentology





Biostratigraphy





Specialist Technical Services

For over 50 years our multi-disciplinary expertise, integrated solutions and advanced technologies have unravelled the complexities of petroleum systems.

We have prepared over 500 non-exclusive multi-client reports and conducted 1,000s of proprietary projects, spanning every prospective basin in the world.

Robertson understands the rocks behind the response.

cgg.com/robertson

CGG
Passion for Geoscience

HGS General Dinner continued from page 23

Biographical Sketches

Richard S. Bishop, Ph.D. (r.bishop@rskuklimited.com) is a geologist who has worked the spectrum of research, exploration and production for Unocal (2 years), ExxonMobil (29 years), and as a consultant/ independent (10 years including RSK). During this time he has seen the world, both as an explorationist and as a synthesizer of global exploration opportunities. He has published on mechanics of piercement diapirism, abnormal pressures, mass balance of prospect assessment, giant fields, implications of overcharge to prospect assessment, US production potential from shales, and world oil supply in transition. In addition, he has numerous proprietary reports on assessment methods, guidelines and results for both plays and prospect assessment.

Dick is Past President of the American Association of Petroleum Geologists, the Houston Geological Society and a past chair of SIPES Houston Chapter. He has been recognized with the AAPG Sproule Award, is a Distinguished Alumnus of the University of Missouri, and an Honorary Member of both the AAPG and HGS. He was also recently named a Legend of the HGS.

Dick earned his Ph.D. from Stanford University, his M.A. from University of Missouri, and B.S. from Texas Christian University. He is currently Executive Director and Chief Geologist of RSK.

Wayne L. Kelley (w.kelley@rskuklimited.com) is the Managing Director and Chief Executive Officer of RSK [UK] Limited. Prior to co-founding RSK in 2003, he started his career in 1974 with Pennzoil and since that time has worked in E&P in Alaska, Brazil, Canada, Mexico, North Sea and much of Africa. Kelley attended Trinity University and the Colorado School of Mines.

Monday, September 28, 2015

HGS North American Explorationists Dinner Meeting

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.

David M. Petty
Hess Corporation, Houston

Mineralogy, Petrology and Hydrocarbon Saturation in the Three Forks Reservoir, North Dakota

The Three Forks reservoir forms the lower part of the "Bakken pool" in the North Dakota portion of the Williston basin. The upper portion of the Three Forks Formation (1st and 2nd Benches) consist dominantly of dolomite, with secondary amounts of quartz or feldspar sand and silt grains, and variable amounts of clay minerals (mostly illite). Anhydritic and calcareous beds occur in the lower half of the formation (3rd and 4th Benches).

In most oil-productive areas of western North Dakota, three reservoir rock types can be defined in the 1st Bench based on mineralogy, capillary pressure characteristics and water saturation distributions. The best Three Forks hydrocarbon saturations occur in brown to brownish-orange to tan, sandy to silty, clay-poor dolostone. Within the oil column, this end-member lithology typically has 2-7% porosity (4.3% average) and 5-40% water saturation. The average mineral content is 63% dolomite, 31% quartz-feldspar and 3% illite (values less than 1% not listed). A second end-member rock type is green, silty, dolomitic mudstone that typically has 5-11% porosity (8.9% average) and 40-90% water saturation. The average mineral content is 35% dolomite, 31% quartz-feldspar, 30% clay minerals (23% illite, 4% chlorite, 3% illite-smectite), and 2% pyrite-marcasite. The third rock type consists of mixed brown and green, sandy to silty dolostone, with intermediate reservoir rock properties. It includes laminated and brecciated lithologies.

Below the 1st Bench, several reservoir rock types occur; however, the brown, clay-poor sandy-silty dolostone lithology is the main oil-bearing rock type in all portions of the Three Forks. The brown dolostone rock type is common in laminae, uniform beds and breccia beds that are interbedded with clay-rich dolostone. The thickest brown dolostone unit, informally referred to as the "Basal Clean" portion of the 1st Bench, is typically 2-3 meters thick, consists of 60-90% brown dolostone and can be correlated regionally. It is the horizontal drilling target in many areas. Porosity occurs in intercrystal spaces between planar-s dolomite crystals. Permeability (Ka) is typically between 0.001 and 0.01 md in the central portion of the oil-producing area. Porosity and permeability increase gradually updip into shallow, water-bearing areas.

Due to small pore-throat sizes, oil column heights greater than 3,000 feet would have been needed to achieve observed hydrocarbon saturations in a water-wet system. Under these conditions, the oil column is too thin to be explained by simple buoyancy-driven oil emplacement. Based on an analogy with low permeability, continuous gas reservoirs, it is inferred that overpressure (current or ancient) that developed during maturation of overlying Bakken shales was required to emplace oil in rocks with existing low permeability. The brown dolostone rock type is a reservoir in basinal areas with overpressure, but it acts as a baffle or seal in normal-pressured flank areas. On a regional scale, hydrocarbon migration was primarily vertical; oil was forced downward under pressure from overlying Bakken shales and there was limited oil migration outside of overpressure areas or areas with regional fracture conduits. ■

Biographical Sketch

David Petty has 36 years of industry experience working as a petroleum geologist in the Williston, Permian, and Michigan basins of the U.S., as well as Tunisia and Egypt. He received a B.S. degree in Geology from Texas A&M University in 1976 and a M.S. degree in Geology from New Mexico Tech in 1979. He has worked for Tenneco Oil Company (1979-1989), British Gas (1989-1994), American Exploration (1994-1996), Belco Energy (1996-2001), Westport Oil & Gas (2001-2004), Kerr-McGee Corporation (2004-2006), Anadarko Petroleum (2006), and Hess Corporation (2006-present). Most of his work experience has been in the North Dakota and Montana portions of the Williston basin, and most of his research has focused on the stratigraphy, diagenesis and reservoir rock properties of early to middle Paleozoic strata in the Williston basin and surrounding outcrop areas. Since 2006 he has worked both Bakken and non-Bakken North Dakota assets for Hess Corporation.

Wednesday, September 30, 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.

Thomas E. Ewing
Frontera Exploration Consultants
San Antonio, TX

Building Texas: Insights from the "Texas Through Time" Project

In June 2013 I began work at the Texas Bureau of Economic Geology (BEG) to put together a summary volume on the geology of Texas as geologists currently understand it, to be designed for general audiences. At present, we are in final drafting, editing and compositing; anticipated printing date is the fall of 2015. The book will be 300-350 pages long and fully illustrated in color. It includes a comprehensive series of time-stratigraphic charts and an atlas of paleogeography and other features.

The book begins with a summary of landscapes and regions of the state. Two short chapters focus on general geologic principles and the layering of the earth beneath Texas, and the plate tectonic position of Texas through geologic time. Four subsequent chapters tell the story of Texas history from Proterozoic through Cenozoic, then into the Holocene. Finally, two chapters survey Texas resources and hazards.

To write such a summary involved summarizing and synthesizing hundreds of geological reports and articles. That has led to some interesting new insights, a few of which follow:

- One terrane that used to form part of Texas (south of the former Marathon Basin) was detached in the Cambrian and later sheared off to form "Cuyania" in South America. Another may be present under East Texas.
- Closing the Paleozoic ocean southeast of Texas ejected the material we see today in the Ouachita and Marathon areas. This closing was not a high-impact continental collision.
- Gulf of Mexico extension had two phases. The first extended the region in a SE direction at upper and lower crustal levels. This extension formed a broad, hot and dry basin lying over a thousand feet below sea level, which was then filled by salt as seawater dribbled in. Afterwards, the second phase produced new oceanic crust, which rotated Yucatan over 40° counterclockwise.
- We can look at larger deltas and make intelligent guesses at the rivers that fed them and the highlands that supplied

HGS General Luncheon *continued on page 31*

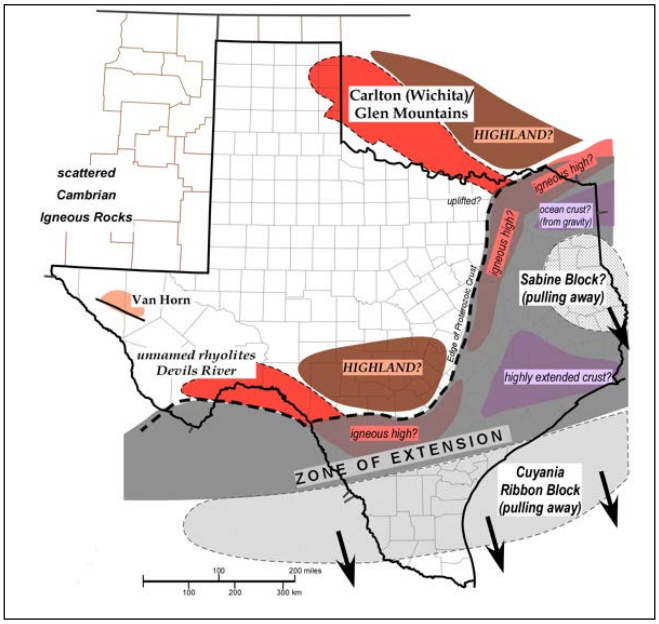


Figure 1. *Ediacaran-Cambrian paleogeography of Texas; extension forming an archipelago at the south edge of Laurentia.*

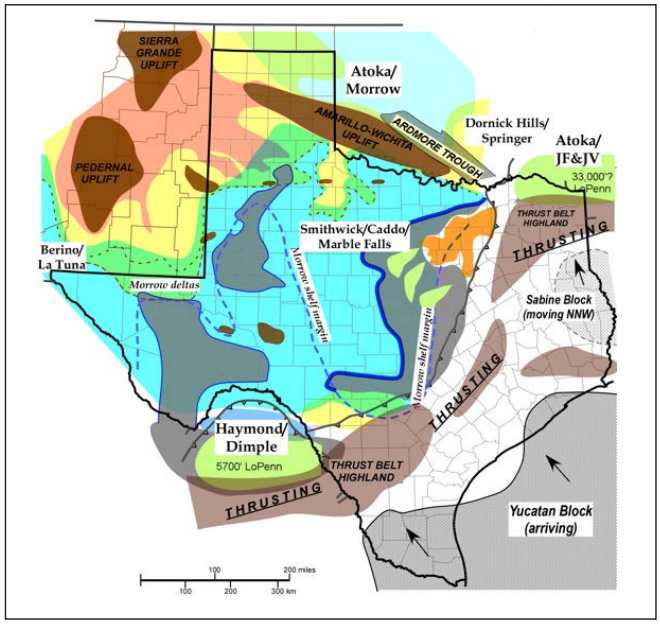


Figure 2. *Early Pennsylvanian paleogeography of Texas: convergence and mountain-building.*

HGS General Luncheon continued from page 29

sediment. Major streams include a 'Lone Oak River' which drained the Hueco Arch and others areas in the Jurassic and Early Cretaceous; a 'Cox River' draining southwest in the Albian; and a 'Bigfoot River' reaching from Big Bend to central Texas in the late Cretaceous.

The project also includes a website, which forms part of the overall BEG website. It will include statewide information; some material from the book; and a series of 70-plus *Great Places to View Texas Geology*. These are miniature field trip guides to highlight publicly accessible places to be wowed by Texas rocks and landscapes. Each site includes a nontechnical discussion of what you see, and why it's important; a gallery of photographs; and a few references and websites for more information. Southeast Texas sites included in the *Great Places* include: Stone City and Somerville (Eocene), the Rayburn Dam area (Catahoula), LaGrange (Oakville), Brazos Bend (Brazos bottomland), the Liberty/Anahuac (Trinity River and delta), and the Sabine Pass, Bolivar Peninsula and Galveston-Freeport areas in the coastal zone. ■

HGS General Luncheon *continued on page 33*

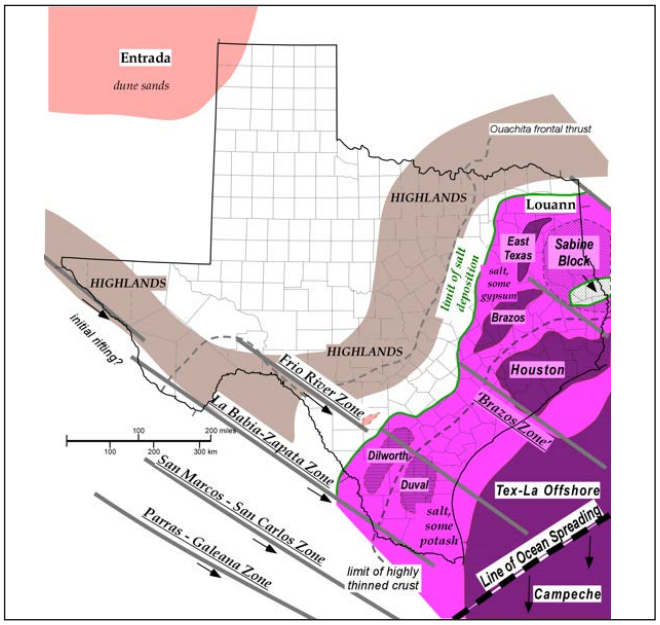


Figure 3. *Middle Jurassic paleogeography of Texas: salt filling a highly extended basin.*

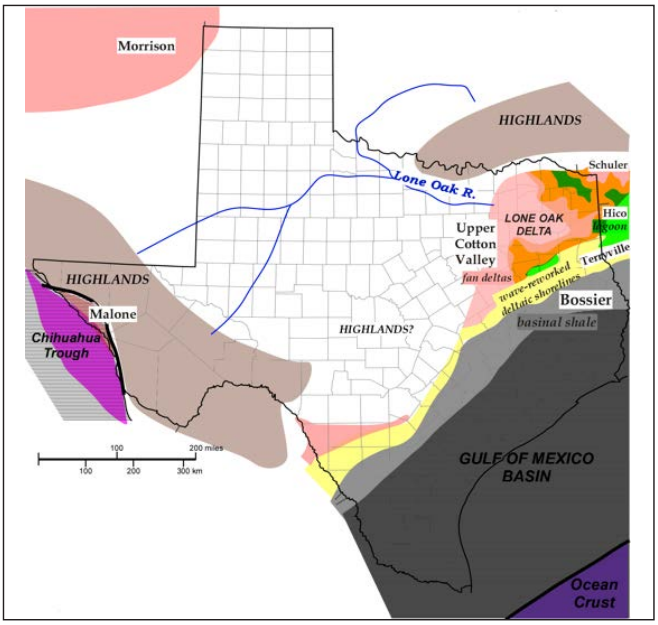


Figure 4. *Late Jurassic paleogeography of Texas; the Lone Oak River drains the Hueco Arch.*

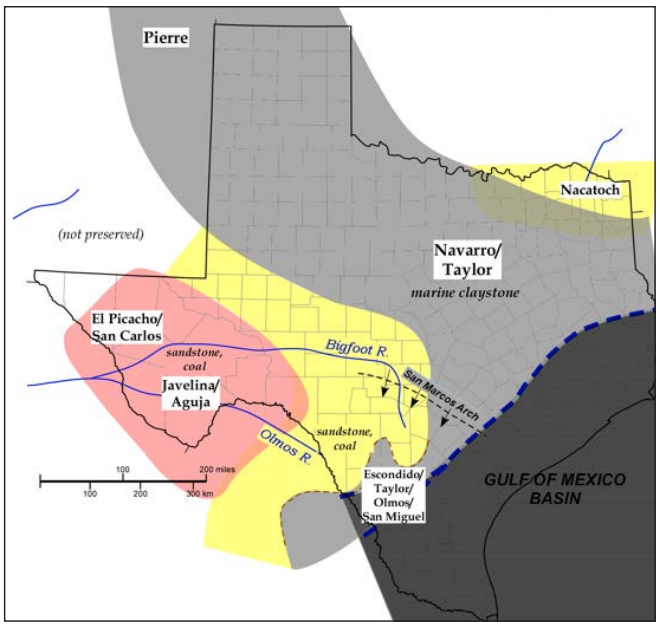


Figure 5. *Late Cretaceous paleogeography of Texas: the Bigfoot River brings sand to central Texas from the Cordillera.*

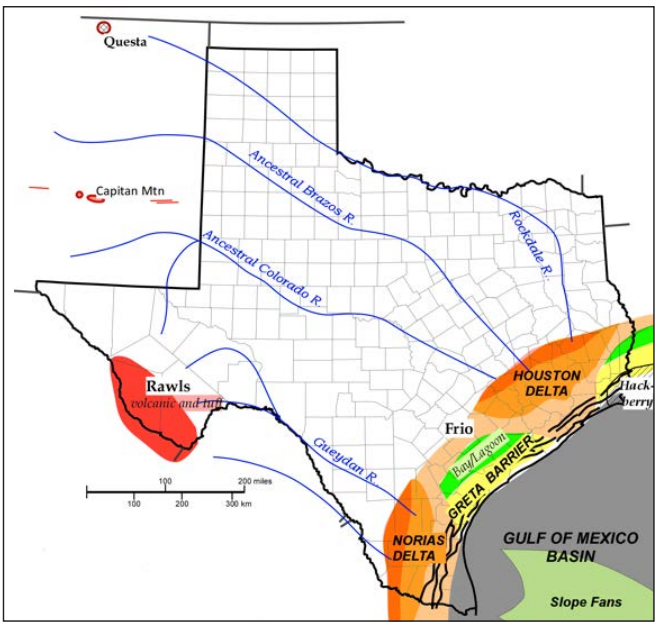


Figure 6. *Late Oligocene paleogeography of Texas: the Rockdale and Gueydan Rivers.*

OLD FIELD REVITALIZATION

SIPES and API are coming together for the first time to bring you a day-long continuing education event!

Hear how various operators have juiced up production and development in sleepy oil fields. Attendees can earn professional development credits (including ethics requirement) toward certification.

Date: Friday, September 25, 2015

Time: 7:30a.m. – 5:00p.m.

Location: Marathon Building
5555 San Felipe Street, Houston, TX 77056

Registration:

Before Aug. 25	After Aug. 25
$195 members	$225 members
$225 non-members	$245 non-members

Register at: www.sipes2015ces.com or www.api2015ces.com

Continental breakfast and lunch provided

To sponsor, email: contact@ mertzenergy.com

GEOLOGISTS | ENGINEERS | GEOPHYSICISTS

Register Now!

Geoscience Day 2015

An Overview of Geological and Geophysical Methods for Individuals New to the Industry

GSH HGS Geoscience Day

Thursday, October 8, 2015
7:00 a.m. to 4:15 p.m.

Global Geophysical Services
13927 S. Gessner Rd.
Missouri City, Texas, 77489

See Details
Registration &
Sponsorship Information
at **www.gshtx.org**
and **www.hgs.org**

$110.00 Early Registration
$125.00 After September 8 (Limited to 120 Registrants)

- Find out about the life of an oilfield from prospect to retirement
- Field acquisition displays
- Presentations
- Docent-aided displays of "Tools of the Trade"
- Gain perspective for discussing projects with a broad audience
- Understand what work goes on in areas other than your own
- Learn what difficulties and problems must routinely be solved

Presented by Geophysical Society of Houston & Houston Geological Society
Contact: Email: GSH-HGS-Geoscience-Day@seismicexchange.com
Tel: 281-741-1624

Sponsors: Please visit
www.gshtx.org or www.hgs.com to support this great event!

HGS General Luncheon continued from page 31

Biographical Sketch

Dr. Thomas Ewing is a geoscientist with over 34 years of experience in hydrocarbon exploration and research. He is a Registered Professional Geoscientist in the State of Texas (#1320) and the State of Louisiana (#468) and an AAPG/DPA Certified Petroleum Geologist (#4538), and holds certification #1610 from SIPES.

He received a B.A. in Geology from the Colorado College (1975), an M.S. in Geochemistry from New Mexico Institute of Mining and Technology (1977), and a Ph.D. in Geological Sciences from the University of British Columbia (1981).

Dr. Ewing was a research geologist for four years at the Texas Bureau of Economic Geology in Austin, where he served as a co-author of the *Atlas of Texas Oil Reservoirs*, and compiled the Tectonic Map of Texas. Since 1985 he has been an owner of Frontera Exploration Consultants, Inc., a San Antonio-based geoscience consulting company. He worked with Venus Oil and Venus Exploration from 1985 to 2005 as staff consultant and Senior Explorationist, playing a main role in its successful exploration in the Yegua Trend of the Gulf Coast Basin and elsewhere in Texas.

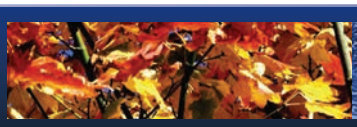
Since 2013, Dr. Ewing has been working with the Texas Bureau of Economic Geology as project director to develop *Texas Through Time*, an illustrated book and website on the geologic history and earth resources of Texas.

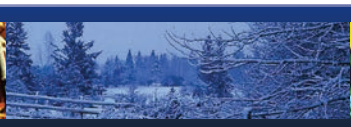
Dr. Ewing has served in many offices in AAPG and its Divisions, Most recently, he completed service as Vice-President for Sections of AAPG (2012-14). He received Honorary Membership in the South Texas Geological Society in 2009, Honorary Membership in the GCAGS in 2010, and BEG Alumnus of the Year in 2011.

Tom has spoken extensively at local, regional, and national geological meetings and published over 75 papers and abstracts. Among other awards, he has received the AAPG Levorsen Award three times, twice in the Gulf Coast Section and once in the Southwestern Section, and has received the AAPG Distinguished Service Award. He has written articles on Gulf Coast geology and hydrocarbons, the geology and tectonics of Texas, and the history and urban geology of the San Antonio area. He wrote the popular guidebook *Landscapes, Water and Man: Geology and Man in the San Antonio Area* published by the South Texas Geological Society in 2008.

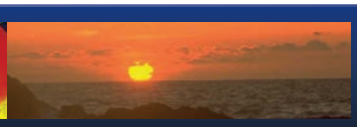
In his spare time, he directs a 60-voice German men's chorus, the San Antonio Liederkranz.

September 2015





Sunday	Monday	Tuesday	Wednesday
	Don't wait, make your reservations online at ww.hgs.org	1	2
6	7	8 **HGS Board Meeting** *6 p.m.*	9 **HGS International Dinner Meeting** *Page 17* **HGS Environmental & Engineering Dinner Meeting** *Page 21*
13	14 **HGS General Dinner Meeting** *"World Oil Supply in Transition," Richard S. Bishop, Wayne L. Kelley, Page 23*	15	16
20 **65th GCAGS Convention** *George R. Brown Convention Center* *Pages 14, 59-63*	21	22	23
27	28 **HGS North American Dinner Meeting** *"Mineralogy, Petrology and Hydrocarbon Saturation in the Three Forks Reservoir, North Dakota," David M. Petty, Page 27*	29	30 **HGS General Luncheon Meeting** *"Building Texas: Insights from the "Texas Through Time" Project," Thomas E. Ewing, Page 29*



GeoEvents

Thursday	Friday	Saturday
3	4	5
10	11	12
17	18	19 **GCAGS Field Trip #4: Spindletop Oil Field – Gladys City Boomtown Museum**
24	25	26

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
Emeritus/Honorary members	$40
Student members	$10
Nonmembers & walk-ups	$50
Except - Env. & Eng.	$30
Nonmembers & walk-ups	$35
Emeritus/Honorary members	$15

September 3-4, 2015
PESGB/HGS Africa Conference
London, England

September 13-16, 2015
AAPG/SEG International Conference and Exhibition
Melbourne, Australia

September 20-22, 2015
GCAGS Annual Convention
Houston, TX

October 9, 2015
GSH/HGS 15th Annual Saltwater Tournament
Topwater Grill Marina
San Leon, TX

October 19, 2015
HGS Golf Tournament
Kingwood Country Club

December 13-16, 2015
GCSSEPM Perkins Conference
Omni Houston Hotel, Westside

January 25, 2016
HGS Legends Night

March 8-9, 2016
HGS Mudrocks Conference
The Woodlands, TX

April 3-6, 2016
AAPG/SEG ICE
Barcelona, Spain

May 8-16, 2016
HGS Grand Canyon Field Trip
Grand Canyon

June 19-22, 2016
AAPG ACE
Calgary, Alberta

Applied Geoscience Conference

March 8 - 9, 2016

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

- Nano-scale Reservoir Behavior and Observations
- Petroleum System Attribute Integration
- Petrophysical Integration to Optimize Completions
- Hybrid Unconventional Opportunities

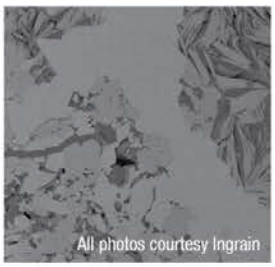
Day 2

- Unconventional Technology for Tight Reservoirs
- Geophysical Advances for Reservoir Characterization
- Recompletions and Refracturing
- Integrated Reservoir Characterization for Fun and Profit

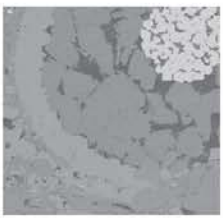
We will also feature posters highlighting university research, a multi core program supporting the oral technical program and a luncheon keynote address.

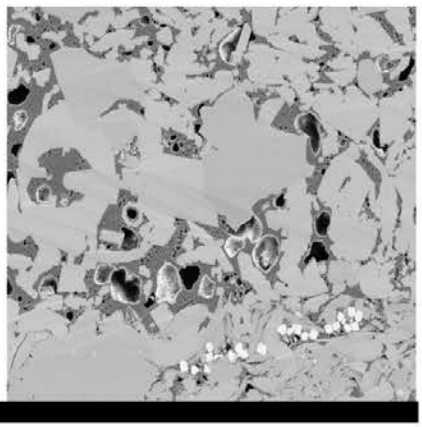
ANADARKO CONFERENCE CENTER
1201 Lake Robbins Drive
The Woodlands, TX 77380

Anadarko Petroleum Corporation



All photos courtesy Ingrain





Registration Coming Soon!

For more information please visit: www.hgs.org

HGS Guest Night 2015

Houston Museum of Natural Science • June 6, 2015

Ken Nemeth with HGS Teacher of the Year Ilena Krupala, Bellville School District, and high school science student honorees

Charles Sternbach with Dr. Jeffrey Karson of Syracuse University. Dr. Karson gave a fascinating talk on Exploring the Ultra-Deep Seafloors of the World.

HGS Guest Night Chairman Dave Reynolds

Sue Pritchett, Engineering Council of Houston, with 2014-15 HGS President Ken Nemeth

Thank you to our sponsors!

bhpbilliton · THUNDER EXPLORATION, INC. · Schlumberger · fairfieldnodal · TGS · Star Creek Energy

HOUSTON GEOLOGICAL SOCIETY presents

Legends Night 2016

Geophysicists Who Have Impacted Geologists

SAVE THE DATE

Monday, January 25, 2016

HGS invites you to join us for the 10th annual Legends Night dinner event honoring three geophysicists who have made significant contributions to the field of geology.

- Alistair Brown – *Author of 'Interpretation of Three-Dimensional Seismic Data'*
- Tom Smith – *Founder and former president of Seismic Micro-Technology (SMT)*
- Peter Duncan – *Founder and Co-Chairman of MicroSeismic*

Norris Conference Center, CityCentre
816 Town & Country Blvd., Suite 210
Houston, Texas 77024

This HGS special event has limited seating. Registration will open in September. Please make your reservations online at www.hgs.org. Tickets are $50 per person.

Be a Sponsor!

Please contact the HGS office, 713-463-9476, or email andrea@hgs.org for information on sponsorship opportunities.

All event profits benefit the HGS Scholarship and Calvert Memorial Funds.

President's Night 2015

Photos by Brittany Davis-Morris

Outgoing President Ken Nemeth handing over the reins to 2015-16 President Deborah Sacrey

(Mostly) outgoing 2014-15 HGS Board members John Jordan (continuing as 2015-16 President-Elect), Directors Jim Beck and Allen Mattis, Editor Dave Miller, President Ken Nemeth, Secretary Ashley Garcia, and Treasurer Joe Lynch

Ken Nemeth presenting former HGS President Barry Katz and HGS Committee Chair Sue Pritchett with a $50,000 donation from HGS to the Science and Engineering Fair of Houston Endowment

2014-15 HGS Bulletin Editor Dave Miller flanked by Chairman's Awards honorees Charlie Revilla (left) and Ed Marks (right)

Ken Nemeth presenting the HGS Gerald A. Cooley Award to Linda Sternbach. The Cooley Award is the highest award granted by HGS, and honors those members who have continued to serve the society well above and beyond the call of duty over many years. Linda has continuously served HGS in a number of capacities since 1985, including HGS President during 2007-8.

Ken Nemeth presenting one of the 2014-15 President's Awards to 2014-15 HGS Vice-President and 2015-16 President-Elect John Jordan.

Ken Nemeth presenting an HGS Honorary Life Membership Award to Paul Babcock

President's Night *continued on page 41*

President's Night 2015 continued from page 39

Ken Nemeth presenting an HGS Honorary Life Membership Award to Steve Brachman

Deborah Sacrey presenting the 2014-15 Distinguished Service Award to Denise Stone

Ken Nemeth presenting one of the 2014-15 President's Awards to Dave Reynolds

Ken Nemeth presenting one of the 2014-15 President's Awards to Christina Higginbotham

Ken Nemeth presenting one of the 2014-15 President's Awards to Mike Erpenbeck

Deborah Sacrey presenting Rising Star Award to Casee Lemons

Deborah Sacrey presenting Rising Star Award to Treasurer-Elect Bryan Guzman

2014-15 Treasurer Joe Lynch presenting Corporate Star Award to Mike Walker (Weatherford Laboratories) and 2015-17 HGS Director Justin Vandenbrink (Weatherford)

2015-17 HGS Director Annie Walker with Dan Phelps

The Recently Elected AAPG HOD HGS Delegates Have Been Announced

DELEGATES Term: July 1, 2015 – June 30, 2018	ALTERNATES (in order of succession)	Voting Statistics:
Lee Backsen	Meredith Faber	3046 Electronic Ballots - 419 Voted Electronically – 13.76%
Pat Gordon	Richard Ball	Mailed 333 Paper Ballots - 39 Voted by Paper Ballot – 11.71%
Denise Stone	Scott Douglas	3379 Total Ballots – 458 Received Ballots – 13.55%
	Sean Kimiagar	

2015 HGS Skeet Shoot

by Tom McCarroll

Flurry Contest

HGS Skeet Shoot Chairman Tom McCarroll with Volunteer Henry Daher

HGS Team – Keith and Andrea Peoples, Leo Alcaraz

The 2015 HGS Skeet Shoot was held on June 27 at the Greater Houston Gun Club in Missouri City. One hundred twelve shooters came out for friendly competition, fellowship, prizes, beverages and barbecue. It was hot, but the weather gods cooperated and held back the rain until the last squads were finished shooting.

This year's trophy belt buckle winners were: High Over All (47/50) **Josh Marks**, HOA runner-up (46) **Matthew Ward**, AA Champ (40) **Mike Kasecky**, AA RU (40) **Lewis Ledlow**, A Champ (35) **Craig Anderson**, A RU (35) **Don McKelvie**, B Champ (31) **Jason Faith**, B RU (31) **Alan Foley**, C Champ (23) **James Turner**, C RU (23) **Mike Santiago**, Lady Champ (41) **Amy Vanderhill**, Lady RU (40) **Rachel Storniolo**. Two teams shot perfect scores of 30 on the two-person flurry: **Ken Dickerman** and **Tim McGinty**, and **John Walker** and **Jeff Heiber.** A complete listing of all the shooters' names and scores can be found online at : *http://iclays.com/scores/scores3985-28003.html* .

Thanks to the generosity of our sponsors we were able to raffle off over $2,000 worth of door prizes, including shooting lessons, a soft cooler from CGG and a stack of gift cards from Academy and Bass Pros. This year's sponsors included Merrick Mainster, and Lee Shelton of Scout Services, LLC, who supplied cold keg beer, much appreciated after shooting in the hot sun. Core Lab, Fairfield Nodal and Bennu Oil & Gas were this year's cap sponsors; Schlumberger sponsored the two-person flurry event. CLF Resources, Geokinetics and Petrophysical Solutions, Inc. were this year's ammunition sponsors. Nutech Energy sponsored a skeet field. **John Walker, Deborah Sacrey, Jeff Heiber, Bruce Kostad, CW Macleod, Bob Ramsey, Steve Davidson, Gary Guerrieri** and **Gary Lamar** all made sponsorship contributions as well. Special thanks this year go to our volunteer workers who came out to help with registration and food service: **Austin Luce, Henri Daher, Kyle Lauhoff**, and **Josh Burrus**. ■

Thank you to our sponsors!

PSI Petrophysical Solutions, Inc.

NUTECH VISIONARY RESERVOIR INTELLIGENCE

Bennu Oil & Gas

Core Lab

fairfieldnodal

Schlumberger

SCOUT SERVICES, LLC UPSTREAM GG&E CONSULTING AND PLACEMENTS

CL&F Resources LP

Geokinetics

10TH ANNUAL

Fundamentals Education Conference

HOUSTON, TEXAS
NOVEMBER 9-13, 2015

Courses Include:

- Subsurface Contouring: The Secrets to Optimizing Your Maps for Oil & Gas Exploration
- Concepts, Models and Case Studies of Dolomitization, with Applications to Hydrocarbon Exploration and Development
- The Petroleum System: An Investigative Method to Explore for Conventional and Unconventional Hydrocarbons
- Fundamentals of Siliciclastic Sequence Stratigraphy
- Rock/Fluid Interactions and Natural Fracture Development and Alteration
- RQ Toolkit: Using Rock Data for Reservoir Quality Assessment
- Reservoir Engineering for Petroleum Geologists
- Practical Geomechanics
- Quick Guide to Carbonate Well Log Analysis
- Clay Minerals in Reservoir Evaluation
- Risk Reduction for Plays & Prospects Using Quantitative Show

Hosted by:

Norris Conference Center- Westchase
9990 Richmond Ave., Suite 102 Phone: 713-780-9300
Houston, TX 77042 Fax: 713-780-9490

Registration and Information
Call AAPG toll free in the U.S. and
Canada at 888.338.3387 or 918.560.2650
F: 918.560.2678 • E: educate@aapg.org
W: www.aapg.org/career/training/in-person/education-conference

AAPG | Fundamentals Education Conference 2015
November 9-13, 2015 - Houston, Texas

Upcoming Education Courses

2015 Courses:

LAST CHANCE

Modern Terrigenous Clastic Depositional Systems	**September 8-15, 2015** S. Carolina
Geochemistry & Modeling of Unconventional Petroleum Systems (with AAPG ICE)	**September 13, 2015** Melbourne, Australia
Complex Geology of the Spanish Pyrenees: Folding, Thrusting & Syntectonic Sedimentation	**September 14-18, 2015** Barcelona, Spain
Lacustrine Basin Exploration	**September 20-27, 2015** Utah
Sedimentology & Sequence Stratigraphic Response of Paralic Deposits	**September 23-30, 2015** Colorado/Utah
Complex Carbonate Reservoirs	**Sept. 26-Oct. 2, 2015** Italy

EARLY-BIRD RATES EXPIRE SOON:

Sequence Stratigraphy, Facies Architecture & Reservoir Characterization of Fluvial, Deltaic and Strand-Plain Deposits Field Seminar	**October 2-9, 2015** Utah

HEDBERG CONFERENCE

The Future of Basin and Petroleum Systems Modeling	**April 3-8, 2016** Santa Barbara, CA
Call for Abstracts now open! Deadline:	**December 1, 2015**

SHORT COURSES

Fundamentals Education Conference	**November 9-13, 2015** Houston, TX
Practical Salt Tectonics	**December 1-4, 2015** Houston, TX

ONLINE COURSES

Giant Oil and Gas Fields Self-paced, 4-week Certificate course	**Online**
Introduction to Shale Gas Self-paced, 4-week Certificate course	**Online**
Unconventional Resources Self-paced, 4-week Certificate course	**Online**
Leadership and Strategic Thinking in the Oil & Gas Industry Self-paced, 4-week Traditional online course	**Online**
Strategic Decision-Making: Current Issues in the Oil Industry Self-paced, 4-week Traditional online course	**Online**

www.aapg.org/career/training/

AAPG Education

Vendor Corner Recognition and Thanks

The Houston Geological Society would like to recognize and thank its many vendors who demonstrated their financial support of the HGS by providing "Vendor Corners" for our 2014-2015 evening technical meetings. These are the companies who present poster displays of their products, studies or services during the social/gathering period prior to the dinner meetings. The Vendor Corner fees that they pay are donated 100% to the HGS Scholarship Funds for geoscience students.

If your company would be interested in hosting a Vendor Corner at an upcoming evening technical meeting, please contact **Rich Germano** at rgermano@fastenergydata.com or (832) 647-5630.

The HGS would like to thank the following Vendor Corner Sponsors 2014–2015:

ALCONSULT INTERNATIONAL

Beicip Inc. an IFPen Group Company
Basin to Reservoir – Modeling & Simulation

C&C Reservoirs

CHEMOSTRAT

BIGS

emgs

fairfieldnodal

FUGRO

GEOPHYSICAL INSIGHTS
FROM INSIGHT TO FORESIGHT™

Welcome to IGC
Integrated Geophysics Corporation

ion

MCG MULTICLIENT GEOPHYSICAL

PGA Ltd
Geological Consultants

PSI
Petrophysical Solutions, Inc.

RSI

Schlumberger

SeisWare™
Industrial Strength Interpretation

TGS

HGS Golf Tournament

Monday – October 19, 2015
Kingwood Country Club

Dust Off The Clubs, Polish The Shoes, And Pad The Handicaps, It's Time For Golf!

Come out and join us for golf, food, friends and fun at the annual HGS Golf Tournament at Kingwood Country Club. This year's format will be a four man scramble, with three flights determined by handicap. First, second, and third place awards (blind draw for 3rd place) will be awarded for each flight. There will be prizes awarded for closest to the pin and long drive as well as many great door prizes and raffle prizes for participants.

The entry fee is $150.00 per person or $600.00 per team on entries received on or before October 9th. Entries will be accepted after October 9th, but a $25.00 late fee will be applied per golfer. Individual entries will be grouped with other individual golfers to make a foursome. Entries are limited and will be accepted on a first-in basis.

Companies or individuals interested in sponsoring the event should contact Mark Dennis at 281-494-2522 (office), 281-705-4346 (cell) or by email at mdennis@petrolog.com.

To enter, please fill out the entry form and email, fax or mail along with your entry fee (payable to HGS Entertainment Fund) to:

Petro Log International, Inc.
One Sugar Creek Center Blvd., Suite 945
Sugar Land, TX 77478
Office: 281-494-2522 Fax: 281-494-2526
Email: mdennis@petrolog.com & mlange@petrolog.com

SCHEDULE OF EVENTS

8:00 – 9:45 a.m.	Registration and free use of driving range (Breakfast will be provided by **Petro Log International, Inc.**)
10:00 a.m.	Shotgun start
3:00 p.m.	Cash bar, open buffet
3:30 p.m.	Door prizes and awards presentation

Team Captain _____ Phone _____ Amount Enclosed _____

Company _____ Email _____

Billing Address _____

Credit card # _____ Exp. Date _____ Code# _____

Please Provide Email Addresses For All Team Members. All Communications Will Be Done Via Email.

Foursome Members *(Please Print)*	**Company**	**Phone Number/Email**	**Hdcp/ Avg. Score**
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

*Please provide email addresses for **all** team members. All communications will be done via email.*

HGS Golf Tournament

Monday – October 19, 2015
Kingwood Country Club

Sponsorship Application

Trevino Sponsorship $500.00

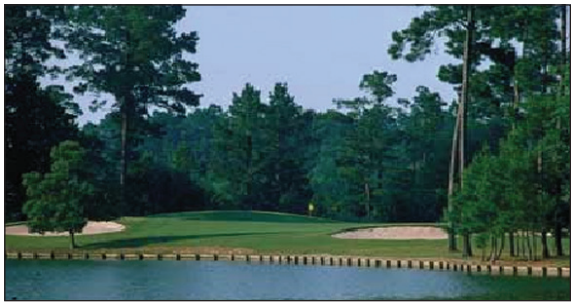
- Hole signs on all three courses.
- **Company name** displayed on sponsor recognition board at registration and awards banquet.

Hogan Sponsorship $750.00

- Hole signs on all three courses.
- **Company logo** displayed on sponsor recognition board at registration and awards banquet.

Nicklaus Sponsorship $1,000.00

- Hole signs on all three courses.
- **Company logo prominently** displayed on sponsor recognition board at registration and awards banquet.
- **Company logo** displayed on driving range and practice putting green.



Title Sponsorship $2,000.00

- Hole signs on all three courses.
- **Company logo prominently** displayed on sponsor recognition board at registration and awards banquet.
- **Company logo** displayed on driving range and practice putting green.
- **Company logo** displayed on beverage carts.
- **Sponsorship includes tournament entry for one team (4 people).**

To sponsor, please indicate your sponsorship level _____
and mail, fax or email sponsor application form along with payment (payable to HGS Entertainment Fund) to: Petro Log International, Inc. • One Sugar Creek Center Blvd., Suite 945 • Sugar Land, TX 77478
281-494-2526 (fax), 281-494-2522 (office), Email: mdennis@petrolog.com

Name _____ Phone _____ Amount Enclosed _____

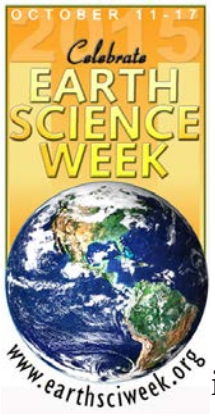
Company _____ Email _____

Billing Address _____

Credit card # _____

Exp. Date _____ Security Code# _____

Please email your company logo to Mark Dennis at mdennis@petrolog.com.
Note: Company logos (high resolution file) must be received no later than October 9th.
If there are any questions, I can be reached at 281-705-4346 (cell) or 281-494-2522 (office).



Earth Science Activities for the Whole Family Coming in October!

Earth Science Week, 2015

October 10 – 18

HGS in partnership with the American Geosciences Institute (AGI) is pleased to announce the theme of Earth Science Week 2015

"Visualizing Earth Systems"

This year's event explores what it means to see our planet through eyes informed by the geosciences.

In celebration of Earth Science Week Houston, HGS will be hosting the following exciting events:

Saturday, October 10 (11:00am – 3:00pm)

Earth Science Celebration at the Houston Museum of Natural Science
Our popular passport program guides students through hands-on activities and interactive science demonstrations.

Special pricing for the event: **$3.50 K – 12 students**
$3.50 College Students/Teachers/Professors with valid school/college ID

Teachers: 2015 ESW Toolkits free with valid school ID

Sunday, October 18

A free family-friendly outdoor geology fieldtrip to High Island, Texas.
Come explore McFaddin Beach with us! Learn about salt domes, beach processes, Pleistocene fossils, modern shells and birds.

For more information, please contact Sharon Choens, (713) 320-1792, sharon.choens@sjcd.edu

Teachers: please visit *http://www.earthsciweek.org/materials* to order your 2015 Earth Science Week ToolKit.

Thank You!

On behalf of the Houston Geological Society, we'd like to thank the many individuals and companies who made donations to the Society's scholarship programs over the past fiscal year. Both of our scholarship programs provide funding to deserving geoscience majors.

The HGS Foundation was formed in 1984 with the charter to provide scholarships to undergraduate geoscience majors from local universities. Program participants include the University of Houston, Rice University, Texas A&M, the University of Texas, Lamar University, Sam Houston State University, and Stephen F. Austin State University. To date, the HGS Foundation has awarded $253,700 in scholarships.

The Calvert Memorial Scholarship Fund was established in 1974. It awards scholarships to U.S. citizens enrolled in graduate geoscience programs. Since granting its first scholarship of $1000 in 1978, it has awarded a total of $406,300 to 84 students studying at 21 different U.S. colleges and universities.

Individuals who made donations through the "HGS Friends of the Foundations" program or through direct donations include:

HGS Friends of the Foundations/Direct Donations: Carl Norman, Ken Nemeth, Leonard Atkins, Arthur Wakie, H. Cumming, John Sullivan, Henry Dean, P.G. Tungein, Dennis Kittler, David Morton, Frank Theall, Sarah Callner, Leighton Young, Lisa Goetz, Sidney Moran, Mitchel Cheney, Larry Jones, Dean Grafton, Glenn Lowenstein, Thomas Tourek, Gerard Haughey, Margaret Dalthorp, The Arena Energy Foundation, Irving Prentice, Mark Norvaille, Howard Kiatta, Paul Hoffman, Dean Callender, Andrew Traweek, Noble Energy, Peggy Rice, Lisa Kay Tuck, Rowlands Geosciences, J.L. Schneider, Thomas Tucker, Keith Chandler, Hugh Hay-Roe, Sidney Moran, Kim Doud, Evelyn Goebel, Louise Duffield, Susan Black, Angela Hammond, and John Adamick.

Corporations and individuals donating to both scholarship programs via their sponsorship of the Legends Night and/or Vendor Corner programs include:

Legends Night: Chevron, ExxonMobil, Ursa Operating, Thunder Exploration, EOG Resources, Noble Energy, EP Energy, Energy XXI Services, Roxanna Oil, Subsurface Consultants & Associates, Cabot Oil & Gas, Halcon Resources, TGS, Cholla Petroleum, Tiger Eye Resources, Memorial Resource Development, Scientific, Weatherford, CORE Laboratories, Vitruvian Exploration, Talos Energy, John Tubb, and Linda Sternbach.

Vendors Corner: Ion Geophysical, Geophysical Insights, EMGS, Beicip, Seisware, Integrated Geophysics Corporation, Petrophysical Solutions, Rock Solid Images, Fugro Geoconsulting, DrillingInfo, Edward Bush, Alconsult International, MCG, TGS, Schlumberger, DIGS, Walter Wornardt, and Sarah Holloway .

Once again, thank you sincerely for helping us help deserving geoscience students. If you are interested in becoming a sponsor of the HGS scholarship programs, you may easily do so when renewing your HGS subscription online or clicking on the "Friends of the Foundations" banner on the opening page of the HGS website. Alternatively, you may contact either of us directly.

Sincerely,

John Adamick, HGS Foundation Chairman, John.Adamick@tgs.com, (713) 860-2114
Carl Norman, Calvert Chairman, dod895@aol.com

GSH / HGS 15th ANNUAL SALTWATER TOURNAMENT

Friday, October 9, 2015

TopWater Grill Marina, 815 Avenue O, San Leon, TX

Galveston Bay Complex and Offshore

This year's Saltwater Fishing Tournament will include an Offshore Division. We are looking forward to a big event this fall and we encourage full family participation.

Galveston Bay Complex Division

Trophies will be awarded for the heaviest individual Redfish (Non-Tagged), Speckled Trout, and Flounder. Trophies will also be awarded for the heaviest individual Stringer - 1 Redfish, 3 Speckled Trout, and 1 Flounder.

Galveston Offshore Division

Trophies will be awarded for the heaviest individual Ling, King Mackerel, and Mahi-mahi

REGISTRATION OPTIONS

- **Registration** fee of $75 includes: Launch Fee, GSH Fishing Cap, Seafood Dinner after weigh-in, Refreshments, Trophies, and Door Prizes.
- **Registration on a Guided Boat** for 4 hours in the morning or mid-day is $200. Bait & tackle is included. Check with the GSH Office, 281-741-1624, for times and availability.
- Non-fishing friends and family enjoy a **Seafood Dinner** for $20

For more information, please contact:

Bobby Perez (GSH)	832-554-4301	Office	281-787-2106	Cell
	832-554-4315	Direct	281-495-8695	Home

E-mail addresses: rdphtx@gmail.com or rperez@seimaxtech.com

The Geophysical Society of Houston and the Houston Geological Society are non-profit and not-for-profit organizations serving the Geosciences Community. Corporate and individual contributions are appreciated and will be acknowledged on several sponsor boards and banners at the Weigh-In Station and Marina. All contributors will be recognized in the GSH Journal following the tournament. This is a great way to entertain friends, family, business associates, and clients. So spread the word!

GSH / HGS SALTWATER TOURNAMENT

NAME: _____ COMPANY: _____

ADDRESS: _____

PHONES: (H) _____ (B) _____ (C) _____

E-MAIL ADDRESS: _____

Upon receipt of the Registration form, each participant will be provided with a copy of the specific tournament itinerary and rules sheet by e-mail. Please register **EARLY**

Please return this form with your check payable to **GSH SALTWATER TOURNAMENT** and Mail to:

Geophysical Society of Houston (GSH), 14811 Saint Mary's Lane, Suite 204 • Houston, Texas 77079

Registration Fee: $ _____ + Sponsor Contribution: $ _____ = TOTAL $ _____

OR call the GSH office with Credit Card payment at: 281-741-16924

DISCLAIMER:

I acknowledge that the Geophysical Society of Houston will not be held responsible for injuries or accidents during this event.

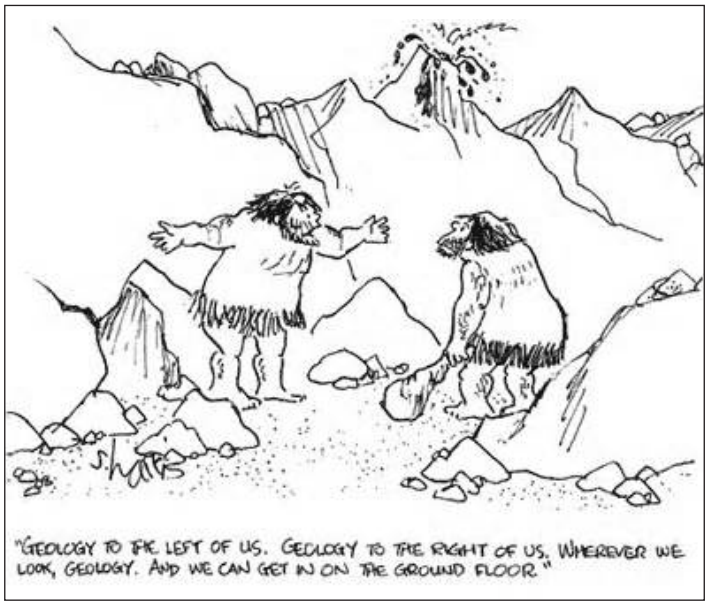
PRACTICE SAFETY!!!!! Signature: _____

Come Rock with Us!
HGS Needs You!

The HGS Nominations Committee is looking for candidates to fill as many as 30 AAPG House of Delegate positions. Candidates must be Active AAPG members, current with their dues. The term for these candidates will run from July 1, 2016 through June 30, 2019. The AAPG Annual conventions during this period will be in Houston (2017), Salt Lake City (2018), and San Antonio (2019). The Houston delegation meets monthly (September through June) to discuss candidates for AAPG membership and to make their recommendations for such to AAPG.

The Nominations Committee also seeks HGS members interested in the governing and running of the Houston Geological Society. It is seeking candidates for President-Elect, Vice President, Treasurer-Elect, Secretary, Editor-Elect, and two Director positions. The elect and director positions are two-year terms. The terms coincide with HGS fiscal years, 1 July 2016 - 30 June 2017 and 1 July 2017 - 30 June 2018. Candidates must be current with their HGS dues and be an Active member of the Society.

If interested, contact **Ken Nemeth**, Nominations Committee Chairman, at knemeth@slb.com. ■



(Courtesy of horton.ednet.ns.ca)

HGS Welcomes New Members

New Members Effective May 2015

ACTIVE MEMBERS

Tracy Adams
Munir Aldin
Martin Anderson
Jeremy Andrews
Megan Avants
Ronidell Baluyot
Kevin Barnard
Jack Carter
Wayne Clark
Jon Conaway
Jeff Fuchs
Boyd Handley
David Hume
Julia Jackson
Kevin King
Peter Lauson
Steve Leeds
Yuhong Liu
Michael Manning
Scott Maxwell
Andrew McCauley
Ronato Mello
Mary Milner
Enrique Perez
Thomas Ratliff
Samuel Reed
Lindsay Roe
Kenneth Ruzyla
Maxwell Silver
Alicia Staszyc
Jennifer Thompson
John Westmoreland
Tollef Winslow

ASSOCIATE MEMBER

Elizabeth Chapman

EMERITUS MEMBER

Michael Zak

STUDENT MEMBERS

Moyo Ajayi
Kivanc Biber
Melanie Bowen
Conrado Cacho
Jianxiong Chen
Sharon Cornelius
Wanda Crupa
Elizabeth Francisco
Andrew Gilfillan
Mario Lara
Mark McCollum
Nicholas McDaniel
Rose Palermo
Dylan Peck
Kellie Rulong-Rasmussen
Ana Milena Salazar
Javier Sanchez
Pulkit Singh
Maya Frances Stokes
Cody Stopka
Patrick Taylor
Kelsey Thomas
Sydney Weitkunat

New Members Effective June 2015

ACTIVE MEMBERS

Amy Garbowicz
Susan Horvath
Kate Pollard
Amber Robbins
Charlotte Schroeder
Dawn Snyder
Mary Vance Davies
Kindsay Wilkinson

ASSOCIATE MEMBERS

Ellen Nodule West
William Tart

EMERITUS MEMBERS

Marc Helsinger
John Scheldt

STUDENT MEMBERS

Aderonke Aderibigbe
Akhil Amara
Jose Andrade
Kaitlyn Andreas
Clint Barnette
Steve Brennan
John Cornthwaite
Eleanor Dietz
Jason Fredricks
Liliana Kum
Maria Carolina Mejia Hernandez
Ethan Melville
D. Patrick Quintero
Jonathan Rogers
Chance Seely
Vasilios Tsibanos

Welcome New Members

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.

This year's legislative session is now closed. The following bills that may be of interest to Texas geologists were passed and sent to the Governor for his signature. Seven were signed by the Governor, two were vetoed, and one was filed without the Governor's signature.

HB 30, by Larson and Vilalba, relating to the development of brackish groundwater. 6/19/2015 signed by the Governor. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB30

HB 163, by Larson and Workman, relating to interstate cooperation to address regional water issues. Sets up the Southwest Water Commission to discuss water needs of the region with other states and Mexico. 6/15/2015 signed by the Governor, effective 9/1/2015. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB163

HB 281, by Simmons, duplicate of HB 3412, identical to SB 878, relating to a limitation on the expansion of certain landfills. This is for Type I municipal solid waste landfills that are located in a municipality in a county with a population of more than 600,000 persons and not more than 500 feet from another municipality. 6/18/2015 filed without the Governor's signature, effective immediately. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB281

HB 655, by Larson, identical to SB 1724 and SB 1903, relating to the storage and recovery of water in aquifers; authorizing fees and surcharges. 6/16/2015 signed by the Governor, effective immediately. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB655

HB 930, by Miller and Doug, relating to water well drillers and pump installers; authorizing fees. Copies of well logs must also be sent to the local groundwater conservation district. 5/30/2015 sent to the Governor. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB930

HB 1232, by Lucio III, relating to a study by the Texas Water Development Board regarding the mapping of groundwater in confined and unconfined aquifers. 5/28/2015 signed by the Governor, effective immediately. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB1232

HB 2230, by Larson, Lucio III and Fallon, relating to the authority of the Texas Commission on Environmental Quality to authorize an injection well used for oil and gas waste disposal to be used for the disposal of nonhazardous brine produced by a desalination operation or nonhazardous drinking water treatment residuals. 6/1/2015 signed by the Governor, effective on 9/1/2015. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB2230

HB 2647, by Ashby, Larson, Paddie, Clardy and Lucio III, identical to SB 1122, relating to a limitation on the authority to curtail groundwater production from wells used for power generation or mining. 6/20/2015 vetoed by the Governor. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB2647

HB 4112, by Burns and Cyrier, relating to the rights of an owner of groundwater. 6/16/2015 signed by the Governor, effective immediately. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=HB4112

SB 854, by Zaffirini, similar to HB 1248, identical to HB 1856, relating to the renewal or amendment of certain permits issued by groundwater conservation districts. 6/1/2015 signed by the Governor, effective 9/1/2015. For more information go to: http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=84R&Bill=SB854.

AGI Geoscience Policy Monthly Review (April 2015)

House and Senate Hold Hearings on Energy Efficiency Legislation

On April 30, 2015 both the House Energy and Commerce Committee and the Senate Energy and Natural Resources Committee held hearings on energy efficiency bills working their way through each chamber.

House Democrats object to a provision in the draft House Title IV Energy Efficiency bill that would remove the 2007 directive to reduce government reliance on fossil fuels and eliminate fossil fuel-based energy in new or renovated government buildings by 2030. The current draft of the bill would also require the Department of Energy (DOE) to revisit their new rule prohibiting homeowners from buying new "non-condensing" gas furnaces, which House Republicans feel is burdensome. **Government Update** *continued on page 57*

Government Update continued from page 55

House Democrats expressed desire for legislation that improves energy efficiency and does not undercut existing efficiency gains.

In the Senate hearing, Chairwoman Lisa Murkowski (R-AK) voiced concerns about potential redundancy and duplication in an energy bill proposed by Senator Al Franken (D-MN). Sen. Franken's American Energy Efficiency Act (S. 1063) would amend title VI of the Public Utility Regulatory Policies Act of 1978 to establish a federal energy efficiency resource standard for electricity and natural gas suppliers. Chairwoman Murkowski argued that Sen. Franken's bill might overlap with state initiatives. Senators John Hoeven (R-ND) and Jeff Flake (R-AZ) also expressed concern over potentially burdensome regulations or redundant programs.

DOE Deputy Assistant Secretary Kathleen Hogan testified that the proposed programs for fossil fuel phase-outs, gas furnace standards, and green building programs were complementary rather than redundant. Although DOE is still reviewing details on the bills, Hogan expressed tacit support for the Senate Shaheen-Portman Energy Savings and Industrial Competitiveness Act (S.720) and Senator Corey Gardner's (R-CO) Energy Savings Through Public-Private Partnerships Act of 2015 (S.858) which promote energy savings performance in contracts including utility energy service contracts.

Administration Proposes New Offshore Drilling Regulations
On April 13, 2015 the Bureau of Safety and Environmental Enforcement (BSEE) proposed new regulations for offshore

HGS Welcomes New Members

New Members Effective July 2015

ACTIVE MEMBERS
Ian Ball
Brian Bourgeois
Peter Brice
Frederic Brigaud
Amanda Buckey
Karina Chevalier
Clay Corbin
Scott Dodson
Margaret Erlandson
Drew Evans
Terry Filthaut
Stephanie Frelinger
Abraham Grader
Janice Gregory-Sloan
David Haddad
Donpaul Henderson
Daniel Huffman
Peter Lellis
David Petty
Phil Salvador
Jason Sanford
Kevin Smart
Dr John Wagner

ASSOCIATE MEMBERS
Katherine Flowers
Monica Iglesias
Bradley Lapp

EMERITUS MEMBERS
I.J. Aluka
Bruce Appelbaum
Mike Arden
Jane Bartusch
Richard Berlitz
Raymond Blackhall
Jack Bryant
Valdis Budrevics
Roger Casey
Robert Immel
James Joyce
Fred Kelly Jr
Robert Lestage
Mike Looney
Byron McNeil
William Meaney
Ronald Nelson
James Perkins
John Preston
Don Rice
Reggie Scolaro
Mary Shih
Frank Vincent
Jerome Walker

STUDENT MEMBERS
Mohit Agrawal
Casey Barton
Braedon Billings
Chao Fu
Oladeji Koledade
Cheristopher Lovely
Kaitlin Moran
Andrew Phillips
Nathan Ronkainen
Pamela Speciale
Marlies van der Schee
Tailah Willliams
Chenliang Wu

Welcome New Members

drilling that would require equipment upgrades for energy developers over the next ten years, including blowout preventers that serve as a final line of defense for offshore drilling wells, to prevent another disaster such as the Deepwater Horizon oil spill.

Oil and gas companies would have to comply with the new regulations in order to continue developing under current and future outer continental shelf leases. The regulations were developed based on investigations into the Deepwater Horizon spill as well as recommendations from federal agencies, academia, environmental organizations, equipment manufacturers, and industry groups who provided knowledge and input on best practices, standards, and specifications for the new regulations.

Administration Releases Quadrennial Energy Review

The Obama Administration has introduced a Quadrennial Energy Review (QER) to address the future of energy transmission, storage, and infrastructure distribution in the U.S. The review provides a road map for Congress with the goal of improving energy infrastructure, ensuring safe transport of volatile energy material such as oil, gas, and coal, securing a stable electrical grid, and leveraging domestic energy production.

The report highlights vulnerabilities to critical energy within the U.S. While the U.S. is a substantial producer of oil and natural gas, it has outdated infrastructure for millions of miles of pipelines and transmission lines, thousands of rail transport lines, and hundreds of natural gas storage facilities and ports handling petroleum. The report emphasizes the risk to pipelines and transmission lines from storms, rising sea level, and increased temperature.

The report has been met with positive comments from industry and Congress. Democrats have indicated their intent to introduce a bill to modernize the U.S. electric grid in keeping with the QER recommendations. Senate Energy and Natural Resources Chairwoman Lisa Murkowski (R-AK) stated that she plans to send a comprehensive energy bill to the Senate floor by summer. The committee is already considering two energy reform bills—Senator Martin Heinrich's (D-NM) bill to amend the Federal Power Act to improve the siting of interstate electric transmission facilities (S.1017) which would grant the Federal Energy Regulatory Commission (FERC) backstop power to authorize power lines that states reject, and Senators John Boozman (R-AR) and Tom Cotton's (R-AR) APPROVAL Act (S.485) which would prevent the exercise of eminent domain for particular transmission projects without explicit permission to do so from state and local government.

USGS to Incorporate Induced Seismicity in Earthquake Prediction Modeling

On April 23, 2015 the U.S. Geological Survey (USGS) released a report on preliminary models of earthquakes triggered by human activity, or induced seismicity, to be added into U.S. hazard modeling. Increasing earthquake activity in the central and eastern U.S. has been linked to industrial operations and disposal of wastewater through deep well injection.

These preliminary models aim to predict intensity and quantity of earthquakes for the U.S. in the next year and will be refined and added into a final hazard model expected at the end of this year.

AGI Geoscience Policy Monthly Review (May 2015)

GAO releases report on oil and gas monitoring and venting

The Government Accountability Office (GAO) released a report on the Department of the Interior's (DOI) regulations regarding royalty payments and measurement standards for onshore oil and gas production. The report, which was requested by Representatives Raúl Grijalva (D-AZ) and Peter DeFazio (D-OR) and Senator Ron Wyden (D-OR), follows a 2010 GAO report.

In the report released May 6, the GAO found that the DOI uses 25-year-old monitoring technology to measure how much oil and natural gas is being extracted from onshore sites. The old technology leads to inaccurate measurements of the oil and gas extracted. Newer measurement methods exist and are used in industry; however, the Bureau of Land Management (BLM) does not require their use. As a result, the government loses royalties on oil and gas extracted from leased lands.

The 2010 report found that companies working on federally leased lands vent $23 million worth of natural gas that could be captured using existing technology; the vented gas represents 16.5 million metric tons of CO_2.

BLM provided a notice of potential rule making on venting and flaring in April 2015, and final action will occur in April 2016.

House Passes Weather and Forecasting Innovation Act

On May 20, 2015 the House passed the Weather Research and Forecasting Innovation Act (H.R.1561) which would fund the National Oceanic and Atmospheric Administration (NOAA) and Office of Oceanic and Atmospheric Research (OAR) research on storm forecasting and early warning systems. The bill would also support postdoctoral research opportunities with the National Weather Service (NWS) and stresses interagency cooperation. The total authorization for fiscal year (FY) 2015 is $90.8 million, and would increase to $100 million for FY 2016 and FY 2017.

Government Update *continued on page 58*

Government Update continued from page 57

In addition to funding research and technology related to weather prediction and warning, the bill would fund alternative strategies for NOAA's data collection. In the coming year, NOAA is required to explore private sector partnerships in relation to its data collection. This includes making weather data specifications public and seeking private industry partnerships.

Bicameral Push Would Give DOI Discretion over Pipeline Permits Through National Parks

Members of the House and Senate have introduced bills that would give the Department of the Interior (DOI) authority over natural gas pipeline permitting on federal lands in lieu of congressional oversight. Current pipeline construction projects can take years to receive congressional approval, with additional waiting time required to obtain DOI permits.

Senator Bill Cassidy (R-LA) introduced a bill on May 7, 2015 that would amend the Mineral Leasing Act (MLA), while Representatives Tom MacArthur (R-NJ) and Cedric Richmond (D-LA) put forward the "National Energy Security Corridors Act" (H.R. 2295) on May 20, 2015. The MLA amendment, co-sponsored by Senators Cassidy, Inhofe (R-OK), and Capito (R-WV), and H.R. 2295 would extend the federal lands covered by MLA to include national parks.

Union leaders and pipeline developers have applauded the efforts in both the House and Senate, which they say will also help states with high electricity prices access more affordable energy.

Tim Spisak, Senior Advisor on Conventional Energy at the Bureau of Land Management, opposed the bill, citing the lack of time for the public to provide input. The Southern Environmental Law Center and other green organizations raised similar concerns. Rep. Alan Lowenthal (D-CA) said he supported new energy infrastructure but believed congressional oversight and public input were vital to the permitting process.

Murkowski Bill to Overhaul Minerals and Mining Regulations

On May 12, 2015 the Senate Energy and Natural Resources Committee (ENR) held a hearing to consider the American Mineral Security Act of 2015 (S. 883). The bill, introduced by ENR Chairwoman Lisa Murkowski (R-AK), would increase support for minerals science, information, and forecasting within the U. S. Geological Survey (USGS) Mineral Resources Program and attempts to streamline the permitting process for mines in an effort to minimize dependence on foreign sources of critical minerals.

The bill addresses concerns over America's dependence on mineral imports, especially rare earth elements (REEs) from China that are critical to renewable technologies and defense operations. The bill focuses on assessing America's own mineral supplies and creating a system for determining which minerals should be deemed "critical." At the hearing, Ed Fogels of the Alaska Department of Natural Resources admitted that even in a heavily mineralized state like Alaska, not all of the state resources have been mapped. USGS Director Suzette Kimball agreed that mapping the nation's resource supplies is needed.

The bill still received mild opposition from USGS and some Democrats, with Dr. Kimball expressing concerns over the feasibility of some of the new requirements proposed for USGS under current funding levels. Senator Al Franken (D-MN) raised environmental concerns over the bill, and Ranking Member Maria Cantwell (D-WA) requested an update to the industry's hardrock mining standards; she did not see the need for an update to the permitting process.

Along with mining reforms, Chairwoman Murkowski and industry supporters hope the bill will boost mineral workforce development and education. The Chairwoman has also expressed hope for additional funding for mineral recycling and the search for mineral substitutes that would lessen our dependence on foreign mineral supply.

Asteroid Mining Bill Passes the House

The House passed the Spurring Private Aerospace Competitiveness and Entrepreneurship Act (SPACE) of 2015 (H.R. 2262) on May 21, 2015 which is designed to facilitate exploration and exploitation of space resources by American businesses. The bill addresses industries' property rights over resources mined from space and governmental support of the space mining industry.

The bill states that any resources that are mined from space "are the property of the entity that obtained such resources, which shall be entitled to all property rights thereto, consistent with applicable provisions of Federal law and existing international obligations." It is unclear whether this law will apply to foreign companies as the House of Representatives' sweeping position has little precedent. However, according to the existing U.N. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which was ratified by the United States in 1967, each nation is responsible for the actions of their citizens in space.

The bill also charges the federal government with exploring how it can support the development of this industry. The bill stresses creating reports on insurance liabilities for the use of government facilities, as well as assessment of industry best practices. ■

2015 GCAGS/GCSSEPM 65th Annual Convention & Exhibit Technical Program, Monday-Tuesday, 21-22 September

ORAL SESSIONS

Monday AM

GULF MEGA-REGIONAL SEISMIC INTERPRETATION • Barbara Radovich and Ed Haire, Session Chairs • Ballroom A

8:30 OPENING REMARKS

8:35 Ed Haire, ION: Onshore Florida Interpretation Utilizing Composited PSDM Seismic integrated with a Mega-Regional Basin wide Gulf of Mexico PSDM Seismic Program

9:00 Barbara Radovich, ION: Correlation of Events for Jurassic, Cretaceous of Northern Gulf of Mexico Margin Using Mega-Regional Onshore/Offshore, Composited PSDM Seismic Grid

9:25 James Pindell, ION: Crustal Framework of the Gulf of Mexico Based on Deep Image Seismic Reflection Data, a New Reflection-Refraction Profile, and a Regional Aeromagnetic Map

U.S. GULF DEEPWATER FIELDS I • Clint Moore and Justin Vandenbrink, Session Chairs • Ballroom A

10:15 OPENING REMARKS

10:20 Elizabeth Watkins, Petrobras: Walker Ridge: A Geological, Non-Seismic, Attribute Method to Generate Facies, Lithology, and Petrophysical Parameters in the Chinook and Cascade Fields

10:45 Frank Evans, Chevron: Advances in the Tahiti Field Subsalt Seismic Imaging and Interpretation: Utilizing Seismic Attribute Analysis and Offset/Azimuth Partitions for Imaging and Interpreting Deepwater Subsalt Structure and Facies

11:10 Pilar Rojas, Shell: The Road to Shell's Appomattox Discovery

SALT TECTONICS—GULF OF MEXICO AND THE WORLD • Rachelle Kernan and Aubrey Collie, Session Chairs • Room 310

8:55 OPENING REMARKS

9:00 Shankar Mitra and Pierre Karam, University of Oklahoma: Controls of the Salt Geometry and Evolution: Experimental Models

9:25 Abah Omale amd Juan Lorenzo, Louisiana State University: Using Fault Kinematics to Evaluate the Relationship between Cenozoic Fault Activity, Sedimentation Rates and Salt Movement in the Gulf of Mexico—A Comparison between Southwestern and Southeastern Louisiana

9:50 BREAK

10:20 Aubrey Collie, University of Texas at El Paso: Facies Distribution and Halokinetic Sequence Stratigraphy of Lower Cambrian Carbonate Strata adjacent to Wirrealpa Diapir, a Secondary Salt Diapir in the Central Flinders Ranges, South Australia

10:45 Joshua McFarland, University of Texas at El Paso: Structural and Stratigraphic Development of a Salt-Diapir Shoulder, Gypsum Valley Salt Wall, Paradox Basin, Colorado

11:10 Constatin Platon, Shell: Salt-Sediment Interaction and Passive Diapirism: A Field-Based Story of La Popa Salt Diapir Rise, Coeval with Deposition of the Viento Formation, La Popa Basin, NE Mexico

CARIBBEAN AND COLOMBIA EXPLORATION • Robert Erlich and Paul Mann, Session Chairs • Ballroom C

8:30 OPENING REMARKS

8:35 Robert Erlich, Pan Atlantic: Petroleum Potential of the Florida-Cuba-Bahamas Collision Zone

9:00 Brian Ott, University of Houston: What Lies Beneath the Tip of the Iceberg? Late Cretaceous to Recent Tectonic Evolution of Jamaica and the Nicaraguan Rise with Implications for a Widespread Eocene Petroleum System

9:25 Carlos Sanchez, University of Houston: Cenozoic Structural, Deformational, and Erosion Events Observed along a 400 km Long Onshore to Offshore Regional Transect across Northwestern South America

9:50 BREAK

10:20 James Pindel, Tectonic Analysis: Role of Caribbean Tectonics in the Tectono-Stratigraphic Evolution of Southern Mexico and the Gulf of Mexico

10:45 Stephen Leslie, PanAtlantic: Petroleum Systems of the Tayrona-Rancheria Basin, Offshore Guajira Peninsula, Colombia

11:10 Rocio Bernal Olaya, University of Houston: Tectonostratigraphic Evolution of the Lower Magdalena Basin, Colombia: An Example of an Underfilled to Overfilled Forearc Basin

EXTRACTING HYDROCARBONS FROM SOURCE ROCKS • Gary Hansen and Robert Reed, Session Chairs • Rm. 320

8:30 OPENING REMARKS

8:35 Malleswar Yenugu, IKON: Source Rock Maturation: Its Effect on Porosity and Anisotropy in Unconventional Resource Plays

2015 GCAGS/GCSSEPM 65th Annual Convention & Exhibit Technical Program, Monday-Tuesday, 21-22 September

9:00 Manas Pathak, University of Utah: Examination of the Generation of Overpressure in Eagle Ford Strata
9:25 Rick Schrynemeeckers, AGI: Optimizing Lateral Placement and Production while Minimizing Completion Costs: An Eagle Ford Case Study
9:50 BREAK
10:20 Gary Hanson, Louisiana State University: Evolution of Challenges to the Development of Unconventional Oil and Gas Resources
10:45 Tom Arnold, Paladin: Case Study: Woodford Shale Source Rock Characterization by Geochemical and Petrologic Evaluation in a Horizontal Well
11:10 Robert Reed, BEG: Low Thermal Maturity Pore Systems: Mississippian Barnett Shale, Southern Fort Worth

Monday PM

U.S. GULF DEEPWATER FIELDS II • Clint Moore and Justin Vandenbrink, Session Chairs • Ballroom A

1:05 OPENING REMARKS
1:10 Paul Jaeger, Anadarko: The Lucius Exploration Story: An Ultra-Deepwater Subsalt Pliocene Discovery
1:35 Shawn Kushiyama, Shell: Stones Field—Deep and Distant
2:00 Christopher Walker, BP: Compartmentalization between the GC0738–1 Mad Dog North Wellbores—Evidence for Post-Sedimentary Slumping in the Early Miocene Reservoirs of Southern Green Canyon, Gulf of Mexico
2:25 V. Nekhorosheva and Amanda Ardill, Shell: Streamlined Modeling and Simulation Approach to Evaluating Waterflood Potential in Ursa Princess Field, Mars Basin
2:50 BREAK
3:20 Cynthia Blankenship, BP: From Moratorium to 10 Rigs—BP in the Deepwater Gulf of Mexico 2010 to 2015
3:45 Clint Moore and Mike Neese, Gulfslope: Deepwater Slope Sands and Reservoirs: Their Potential Oil and Gas Fields
4:10 Wesley Cantwell, Schlumberger: Redefining Geological Evaluation in Deepwater using New High-Resolution Borehole Imaging Technology
4:35 Oluwayomi Oyedele, GEMS: Seismic Facies Analysis and Age Dating of Mid-Pleistocene Channel-Lobe Deposits, Mad Dog Field

GEOPHYSICAL PROBLEM-SOLVING TECHNOLOGY • Selim Shaker and Steve Getz, Session Chairs • Room 310

1:05 OPENING REMARKS
1:10 Selim Shaker, GAS: Prediction of Seal Failure and Reservoir Breaching in Deepwater
1:35 Yogesh Agnihotri, CGG: Salt Delineation Using Vector Offset Output of Full Azimuth Data
2:00 Nicholas Brooks, READ: Defining a Steeply Dipping Salt Flank in Mississippi with a New High-Certainty 3D Method
2:25 Laurence Corbett, Schlumberger: Dynamic Datasets using Forward Modeling to Reduce Uncertainty and Improve Recovery

GLOBAL 3D SEISMIC STUDIES (GCSSEPM) • Erik Scott and Thomas Hearon, Session Chairs • Room 310

3:15 OPENING REMARKS
3:20 Erik Scott, Talisman: Integration of Core and Seismic Data for 3D Depositional Environment and Reservoir Architecture Interpretation—Example from the CRD Field, Offshore Vietnam
3:45 Jacob Covault, Chevron: Reservoir Architecture and Stratigraphic Evolution of Channelized Deepwater Depositional Systems, Angola
4:10 Tom Wooltorton, ffA: Shallow Hazard and Gas Escape Systems Modeling Using 3D Seismic from the Taranaki Basin, New Zealand
4:35 Sasha Gumprecht, University of London: Tectono-Stratigraphic Evolution of the Centaur 3D Survey, Exmouth Plateau, North West Shelf, Australia

MEXICO EXPLORATION AND OPPORTUNITIES • Ricardo Padilla y Sanchez and Anthony Rodriguez, Session Chairs • Ballroom C

1:05 OPENING REMARKS
1:10 Ricardo Padilla y Sanchez, Universidad Nacional Autonoma de Mexico: The Early Mesozoic Rocks of Mexico Revisited
1:35 Edgar Rangel-German, NHC: Energy Reform in Mexico
2:00 Craig Davis, INEXS: Overview of the Petroleum Basins of Mexico
2:25 Paul Mann, University of Houston: New Insights into the Mesozoic Evolution of the Gulf of Mexico Basin from Gravity and Deep-Penetration Seismic Reflection Data
2:50 BREAK

2015 GCAGS/GCSSEPM 65th Annual Convention & Exhibit Technical Program, Monday-Tuesday, 21-22 September

3:20 Usama Yarbuh, CICESE: The Kinematics of the Deepwater Mexican Ridges Fold Belt, Western Gulf of Mexico Basin
3:45 Stephen Cossey, Cossey and Associates and Don Van Niewenhuise, University of Houston: The Chicontepec Formation, Onshore Eastern Mexico: Compelling Evidence for the Eocene Gulf of Mexico Drawdown Theory
4:10 Guillermo Perez Cruz, Universidad Nacional Autonoma de Mexico: The Role of Seismic Technology to Unravel the Hydrocarbon Potential of Mexican Basins
4:35 Erik Medina Romero, Universidad Nacional Autonoma de Mexico: Regional Study to Find Prospects for Geological Storage of CO_2 in the Burgos Basin

ROCK SAMPLES AND RESERVOIR ANALYSIS • Robert Merrill and Dallas Dunlap, Session Chairs • Room 320

1:05 OPENING REMARKS
1:10 Robert Merrill, Catheart: Visual Rock Characterization can Benefit Reservoir Analysis
1:35 Konstandinos Zamfes, PSI: Drilling Cutting Analysis and Geo-Algorithm Conversion to Petrophysics
2:00 Harry Rowe, University of Texas at Austin: Chemostratigraphic Applications of Handheld X-Ray Fluorescence to Mudrock Plays: Methods, Pitfalls, Limitations, Aspirations, and a Good Example
2:25 Konstandinos Zamfes, PSI: OPAL: On Surface Petrophysical Analytical Logging: New Petrophysical Measurements on Drilling Cuttings While Drilling

ADVANCED STUDIES OF PETROLEUM SYSTEMS • Dallas Dunlap and Robert Merrill, Session Chairs • Room 320

3:15 OPENING REMARKS
3:20 Gary Rice, GeoFrontiers: The Vertical Migration Model and Recent Advances in Geochemical Exploration
3:45 Richard Bishop, Consultant: Implications of Source Overcharge for Prospect Assessment
4:10 Rick Schrynemeeckers AGI: Improving Petroleum System Identification in Offshore Salt Environments: Gulf of Mexico and Red Sea Case Studies
4:35 Jeffery Nunn, Louisiana State University: Spatial Variations in Pore Water Salinity: Implications for Fluid Flow Pathways and Reservoir Compartmentalization in a Deepwater Gulf of Mexico Field

Tuesday AM

GCAGS EDUCATION/LEADERSHIP FORUM 2.0: Foundational Talks for the Gulf of Mexico I • Charles Sternbach, Forum Chair • Assembly Area A

8:20 Charles Sternbach: Introduction
8:30 Scott Tinker, BEG: Pemex Reform: Expanding Role of the Gulf of Mexico in Meeting our Energy Needs
9:10 John Dribus, Schlumberger: Reservoir Characteristics of Turbidite Depositional Facies and Key Risks for Basin Floor Fan Turbidite Reservoirs
9:50 BREAK
10:20 Brian Horn, ION: Regional Mapping Across the Entire Gulf of Mexico Basin—New Plays and New Perspectives
11:00 John Snedden, University of Texas at Austin, Institute for Geophysics, GBDS Project: Comparison of Cenozoic and Mesozoic Deepwater Fans: Depositional Systems from Source to Sink

ONSHORE GULF OF MEXICO EXPLORATION I • Tim Rynott and Tom Ewing, Session Chairs • Assembly Area B

8:30 OPENING REMARKS
8:35 Tom Ewing, Frontera: Opening of the Gulf of Mexico and Origins of the Gulf Coast Basin: Review and a Revised Working Model
9:00 Art Donovan, BP: Chronostratigraphic Relationships of the Woodbine, Eagle Ford, and Austin Groups across Texas
9:25 Robert Loucks, BEG: Pore-Network and Reservoir-Quality Analysis of the Upper Cretaceous Woodbine Sandstone in the East Texas Field
9:50 BREAK
10:20 Shirley Dutton, BEG: Factors Controlling Permeability Variation in Paleogene Wilcox Sandstones with the Same Burial and Temperature History, Texas and Louisiana Gulf Coast
10:45 William Ambrose, BEG: Facies Variability and Reservoir Quality of Incised Valley Fill and Highstand Shallow-Marine Systems in the Upper Cretaceous (Cenomanian) Tuscaloosa Formation, Louisiana, U.S.A.
11:10 Tom Ewing, Frontera: Finding New Oil and Gas Reserves in Fluvial Systems using AVO: The Upper Frio in Wharton County, Texas

GROUNDWATER ENVIRONMENTAL CASE STUDIES • Matt Cowan, Session Chair • Room 332A

8:30 OPENING REMARKS
8:35 Robert Dedoes: Geoscience-Based Management of Soil during Oil and Gas Development: A Study Conducted in the Eagle Ford Oil and Gas Production Area

2015 GCAGS/GCSSEPM 65th Annual Convention & Exhibit Technical Program, Monday-Tuesday, 21-22 September

9:00 Scott Hamlin, University of Texas at Austin: Using Electric Logs to Estimate Groundwater Salinity and Map Brackish Groundwater Resources with an Example from the Carrizo-Wilcox Aquifer in South Texas
9:25 Ezat Heydari, Jackson State University: Variations in Shallow Groundwater Composition in Hinds and Madison Counties, Mississippi
9:50 BREAK
10:20 H. C. Clark, Rice University: Springfield Spring, Drought Stress, and Aquifer Recovery: A Central Texas Case Study with Implications for Small Town Water Future
10:45 Mary Barrett, Consultant: Historic Oilfield Arsenic Usage and Pit Groundwater Models: An Example from Lake St. John Field, Louisiana
11:10 Douglas Carlson, Louisiana State University: The Environmental Impact of No-Till Farming on Lower Mississippi River Quality

GCAGS SPECIAL BUSINESS FORUM: GEOLOGISTS AS LEADERS IN FINANCE, BANKING, AND A&D • Steve Brachman and Jeff Lund, Forum Chairs • Room 332B

8:30 to 11:30
Andy Clifford – Saratoga Resources
Dick Stoneburner – Pine Brook Partners
Tom Wilker – Carlyle Group
Jeff Jones – Van Operating
Stuart Burbach – Nautilus Energy

Tuesday PM

GCAGS EDUCATION/LEADERSHIP FORUM 2.0: Foundational Talks for the Gulf of Mexico II • Charles Sternbach, Forum Chair • Assembly Area A

1:15 Charles Sternbach: Opening Remarks
1:20 Richard Stoneburner, BHP: The Discovery, Reservoir Attributes, and Significance of the Hawkville Field and Eagle Ford Shale Trend, Texas—A Giant North American Gas Discovery
2:00 Charles Kerans, University of Texas at Austin: Cretaceous Carbonate Oil and Gas Fields in the Gulf of Mexico, Sequence Setting, Reservoir Architecture, and Future Potential

PANEL DISCUSSION, hosted by Charles Sternbach and Scott Tinker • Assembly Area A

3:10 to 4:30 Scott Tinker, Tom Tinker, and Nathan Tinker: Geo-Generations: 60 Years of Family Fun in the Patch

ONSHORE GULF OF MEXICO EXPLORATION II, Tim Rynott and Tom Ewing, Session Chairs • Assembly Area B

1:05 OPENING REMARKS
1:10 Larry Baria, Jura-Search: Relatively Large Mid Ramp, Highstand, Microbiolite Patch Reefs: A New Exploration Play for South Alabama
1:35 Robert Karlewicz, RFH: The Cotton Valley Limestone Pinnacle Reef Trend, 20 Years Later, East Texas Basin
2:00 Charles Goodson, PetroQuest: Cris R: Prolific Onshore Louisiana Discovery
2:25 Tim Rynott, Ridge Resources: Onshore Lower Wilcox and Cretaceous: Plays and Potential
2:50 BREAK
3:20 Martin Cassidy, University of Houston: The Norphlet Desert and its Sand Dunes: In a Subaerial Environment, but below Sea Level
3:45 Jeff Spencer, Amromco Energy: The 40th Anniversary of South Louisiana's Lower Tuscaloosa Trend—Recollections and Early Media Coverage
4:10 Peter Rose, Rose and Associates: Late Cretaceous and Tertiary Geologic History, Edwards Plateau, Llano Uplift, and Hill Country, Texas

ENVIRONMENTAL AND COASTAL GEOLOGY • Jeff Paine and Kathleen Haggar, Session Chairs • Room 332A

1:05 OPENING REMARKS
1:10 Joseph Carlin, California State University: Shoreface Sedimentation along a Transgressive Barrier Island: Understanding the Interplay between Short-Term Events, and Long-Term Sea Level Rise, Processes in Shaping these Dynamic Coastal Environments
1:35 Jeff Paine, University of Texas at Austin: Airborne Lidar and Near-Surface Geophysics: A New Approach to Discriminating Quaternary Depositional Units on the Texas Coastal Plain

2:00 **Kathleen Haggar, Dynamic Measurement:** Analysis of the Goose Point area near Lacombe, LA, Area Validates New Geophysical Data Type—Natural Source Electromagnetism (NSEM) for Detection of Lineaments Associated with Faults and Sedimentary Features

2:25 **Bruce Hart, Statoil:** Why the Greenhorn Cyclothem of Utah/Colorado/Kansas Helps Us to Understand Better Eagle Ford Stratigraphy

CHEMOSTRATIGRAPHY AND PALEONTOLOGY • Clement Bataille, Session Chair • Room 332A

3:15 **OPENING REMARKS**

3:20 **Clement Bataille, Chevron:** Chemostratigraphy Based Age Model for the Black Peaks Formation: Implications for Early Paleogene Paleoclimate in Sub-Tropical North America

3:45 **Malcolm Hart, UK:** Palaeoecology of Cretaceous Foraminifera: Examples from the Gulf of Mexico Region

4:10 **Ali Somarin, Thermofisher:** Chemostratigraphy and Identification of Fine-Grained Sedimentary Rocks Using Portable XRF

4:35 **Juan Carlos Silva Tamayo, University of Houston:** Sedimentologic Expression of the Cretaceous Oceanic Anoxic Events along Eastern and Northern Colombia

SEISMIC ATTRIBUTES AND GEOPHYSICAL TECHNOLOGY • Sharon Cornelius and Don Van Niewenhuise, Session Chairs • Room 332B

1:05 **OPENING REMARKS**

1:10 **Andreas Laake, Schlumberger:** Understanding Deepwater Transport Systems through Processing and Interpreting Seismic Data in Color

1:35 **Deborah Sacrey, Auburn Energy:** Geological Interpretation using Pattern Recognition from Self-Organizing Maps and Principal Component Analysis

2:00 **Sharon Cornelius, University of Houston:** Extraction of Seismic Attributes for Reservoir Characterization in Subsalt Environments, Keathley Canyon and Walker Ridge Areas, Gulf of Mexico

2:25 **Jingqui Huang, University of Houston:** A Holistic Geophysical Approach to Identifying Fault-Related Hazards in a Challenging Urban Environment—Downtown Houston

NEW IDEAS IN MAPPING AND EXPLORATION • Sharon Cornelius and Don Van Niewenhuise, Session Chairs • Room 332B

3:15 **OPENING REMARKS**

3:20 **Selim Shaker, GAS:** Exploring the Missing Reflectivity Blind Zone on the Gulf of Mexico Shelf

3:45 **Paul Comet:** The Sulfur to Nitrogen Ratio as an Aid in Mapping the Petroleum Producing Trends of the Contiguous U.S. 48 States Using the USGS Database

4:10 **Ibrahim Cemen, University of Alabama:** Along Strike Structural Variations in the Frontal Ouachitas–Arkoma Foreland Basin Transition Zone

POSTER SESSIONS

Poster Sessions will be in the George R. Brown Third Floor Exhibit Hall during the Sunday Icebreaker, All Day Monday, and Tuesday Morning. See over 60 Student and 20 Professional Posters!

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.

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 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.**

Random Inside Ad Placement Black & White Prices Shown Color add 30% to prices shown 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	$823	$1,387	$2,488	$4,734	$7,830	$7,560	$7,384	$6,858	$6,750	$2,700
9	$823	$1,387	$2,488	$4,734						
8	$750	$1,260	$2,242	$4,307						
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

Shirley Gordon, *HPAC-HGS Liaison*

Attention spouses of Houston Geological Society members! (HGS members, please pass this article along). You are cordially invited to join HPAC, an organization designed to pique one's interest.

Back in 1950, a small foresighted group of geologists' wives got together and formed what was then dubbed the Houston Geological Auxiliary as a support group for each other when hubby was out "well sitting" for days at a time. They decided to established their own social network, and many lifelong friendships were formed over time. We continued as that group for fifty-nine years. Six years ago, another group of very foresighted ladies realized that our membership was dwindling, and that our sister organizations were facing the same problem. So it was decided that we should merge the four into one. At that time, the Houston Petroleum Auxiliary Council (HPAC) was founded and we are now growing and better than ever. We continue to have informative, entertaining and educational programs, all the while making new long-lasting friendships with a more diverse group of spouses. TRY US... YOU'LL LIKE US!

We have a book club with 27 members that meets the first Monday in August, November, February and May at 10:30 am. The next book discussion will be about *The Invention of Wings* by Sue Monk Kidd on August 3rd. This group is chaired by **Mickey Murrell**; you can contact her at 281-469-2272 for more information. The November 2nd book is *Lost in Shangri-la: A True Story of Survival, Adventure and the Most Amazing Rescue Mission in World War II* by Mitchell Auckoff. Sounds very interesting, doesn't it?

Two bridge groups are also part of our organization. **Daisy Wood** chairs the one that meets at The Petroleum Club, 1201 Louisiana (top floor of the Total Building) on the third Wednesday of each month. Call her at 832-581-3132 or 713-826-7952. For those of you not wanting to go downtown, the "Cinco Mas" bridge group meets the second Thursday of each month, is chaired by **Audrey Tompkins**, and convenes at the Westchase Hilton, 2900 Briarpark. You can call Audrey at 713-686-0005 for more information. Check with both about the time.

LAST, BUT NOT LEAST — Our first event will be September 16th at the Brookwood Community, with the Brookwood Bell Choir performing. **Barbara Peck** is chairman of the program; you can call her at 281-496-2139 for more information. Invitations to HPAC members will be mailed in August. If you have never been to Brookwood, it is well worth the trip. Not only is the food delicious and the service grand – there are lots and lots of plants and gifts to tempt your shopping urges.

HPAC is looking forward to a fun year with a great Executive Board now in office. President Norma **Jean Jones** and 1st Vice-President **Bernadette Billard** have some wonderful programs planned. Please consider becoming a part of this amazing group of women. Call **Wanda Shaw**, 2nd Vice-President and membership chairman, at 281-467-5999 to join HPAC. ■

Norma Jean Jones - President, Bernadine Billard - 1st Vice President, Wanda Shaw - 2nd Vice President, Sara Nan Grubb - Secretary, Janet Steinmetz-editor, Sally Blackhall - Parliamentarian.

Wanda Shaw and Mickey Murrell

Millie Tonn and Margery Ambrose

You are invited to become a member of

HPAC

2015–2016 dues are $20.00 Mail dues payment along with the completed information

to **Wanda Shaw** • 1506 Haven Lock Drive • Houston, Texas 77077

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

HGS *Bulletin* 2014-2015 Technical Index

2014–2015 Technical Index continued from page

2014–2015 Technical Index continued from page

WELLSITE GEOSCIENCE SERVICES

When time is money, Wellsite Geoscience is money well spent.

Whether you're exploring a basin, producing a well or completing a shale play, time is money. That's why Weatherford Laboratories brings a suite of formation evaluation technologies right to the wellsite. Utilizing mud gas and cuttings, these technologies provide detailed data on gas composition, organic richness, mineralogy and chemostratigraphy in near real time. As a result, operators now have an invaluable tool to assist with sweet spot identification, wellbore positioning, completion design and hydraulic fracturing. We call it Science At the Wellsite. You'll call it money well spent.

SCIENCE AT THE WELLSITE™

www.weatherfordlabs.com

Formation Evaluation | **Well Construction** | **Completion** | **Production**

Weatherford
LABORATORIES

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

Periodicals
U.S. Postage
PAID
Houston, Texas