

# HGGS Bulletin

Volume 62, Number 2

Houston Geological Society



October 2019

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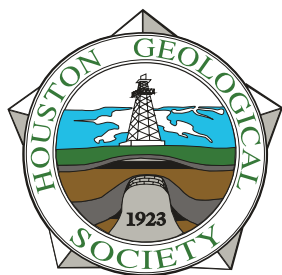


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# The Bulletin

Houston Geological Society

Volume 62, Number 2

October 2019

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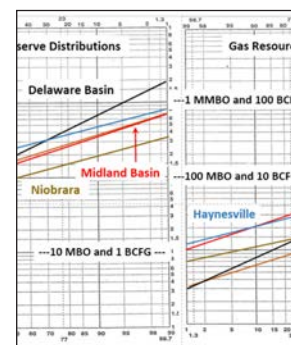
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**About the Cover:** The cover photo shows an outcrop of the Vaca Muerta Formation, which is a marine type-II source rock of Cretaceous age in the Neuquén Basin, Argentina, interbedded with fluvial sands. The photo is taken by HGS member Linda Stembach during her recent field trip while attending AAPG ICE meeting.

# 2020 HGS-PESGB Africa Conference



September 15-16, 2020

Norris Conference Centers | Houston, TX



Call for Abstracts January 2020

Abstract Deadline April 2020



Submit abstracts - [Africa2020@hgs.org](mailto:Africa2020@hgs.org)

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## **69th GCAGS Conference:**



**Conference hosts:  
the Houston Geological Society and GCSSEPM**

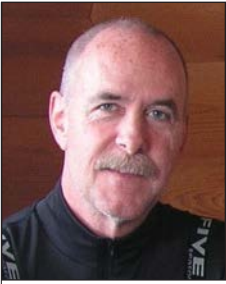
**REGISTER NOW !**

**[www.2019.gcagshouston.com](http://www.2019.gcagshouston.com)**

**Check website to see impressive listing of  
oral presentations, short courses,  
and field trips. Two full days of technical talks  
and posters!**

**Immersive business and career panels,  
plus student awards and entertainment  
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**Stay at the Westchase Marriott  
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Discount room rates available.**



*Jon Blickwede*  
*president@hgs.org*

## Exploring Together



We geoscientists are indeed all explorers at heart. But we never explore or discover anything without depending on the talents and contributions of others. Whether our collaborators are indirect or even long gone, we benefit from the documentation of their work in publications, or they are alive and well and are part of a team in which we labor on the same project at the same time, there is always interdependency. Despite the increased efficiency of online, remote communication, there is still no substitute for face-to-face meetings and interaction with our geoscience colleagues. The more we can directly interact with a broad cross-section of our colleagues, outside the boundaries of our respective organizations and specialties, the more we are exposed to different ideas and perspectives – thus the greater our chances of finding optimal solutions to the challenges that we face in our current and future projects. So, let's explore together as much as we can.

This month presents a variety of great opportunities to explore together, beyond the walls of our offices. Apart from the usual array of HGS dinner and luncheon meetings, there are a couple of October events co-hosted with the Geophysical Society of Houston (GSH): a new social event on the north side, Family & Friends Fall Fun Day, on Saturday the 5th in The Woodlands; and the annual joint HGS/GSH dinner meeting on Monday the 7th at the Norris Center. By the way, I recently met with GSH President Craig Beasley over lunch, to start a dialogue on ways in which HGS and GSH can further increase collaboration. As a start, Craig and I agreed to apply for membership in each other's Society.

HGS NeoGeos, in collaboration with SPE, remains active this month with a career development seminar on data science & analytics. Kudos to Casey Langdon and the rest of the NeoGeos Committee for taking the lead in organizing this timely educational opportunity.

HGS, in partnership with the American Geosciences Institute (AGI), will sponsor the 2019 edition of Earth Science Week on 12-20 October at the Houston Museum of Natural Science; this year's theme is "Geoscience is for Everyone," and will emphasize

the importance of geoscience in the everyday lives of all people.

Last but certainly not least, the big event here in Houston during October is GeoGulf 19, the new name for the Gulf Coast Association of

Geological Societies (GCAGS) annual convention. This year, HGS is the host society for GeoGulf 19, and it promises to be, as usual, one of the key E&P events of the year, with a wide offering of oral and poster presentations, short courses, field trips, and social gatherings. Details can be found at <https://2019.gcagshouston.com>. I urge you all to attend, and I hope to personally explore new geoscientific ideas with many of you at GeoGulf 19 at the Marriott Westchase.

Finally, I'd like to update you on some of the progress your Board has made during the past month toward fulfilling my main objectives as 2019-2020 HGS President, which were outlined in my column in the September 2019 issue of the *Bulletin*. Though never a pleasant task, some necessary cost-cutting was initiated by the Board that will help preserve the financial "health" of HGS during the ongoing industry downturn. The overall number of HGS events for 2019-2020 has been reduced, including the elimination of the ChairFest and MidFest dinners for committee chairs, and HGS Guest Night for 2020. In the case of Guest Night, there has been a steady decrease in attendance over the past few years, to the point where HGS took a significant financial loss from the June 2019 edition. Going forward, the Guest Night Committee will examine ways in which the event can be modified to increase interest in attendance by HGS members and their families and begin plans to re-start Guest Night during the subsequent fiscal year; your ideas in this regard are welcome!

On the positive/constructive/growth plans side, we are adding some new events to the 2019-2020 HGS calendar which we hope will be popular for years to come. In addition to the inaugural HGS/GSH Family & Friends Fall Fun Day mentioned above, there will be a new, major annual event co-sponsored by HGS and the European Association of Geoscientists & Engineers (EAGE) conference focused on South and Central America, on 19-20 November at the Norris Center. **Never stop exploring!** ■

**EAGE**

EUROPEAN  
ASSOCIATION OF  
GEOSCIENTISTS &  
ENGINEERS



# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

South & Central American Petroleum Plays for the Third Millennium

## SAVE THE DATE

19-20 NOVEMBER 2019 • NORRIS CENTER, HOUSTON, TX, UNITED STATES

[www.HGS.org](http://www.HGS.org) [www.eage.org](http://www.eage.org)

### Equatorial and South Atlantic Conjugate Margin Workshop

Understanding Structural Architecture and Petroleum Potential

**Monday**

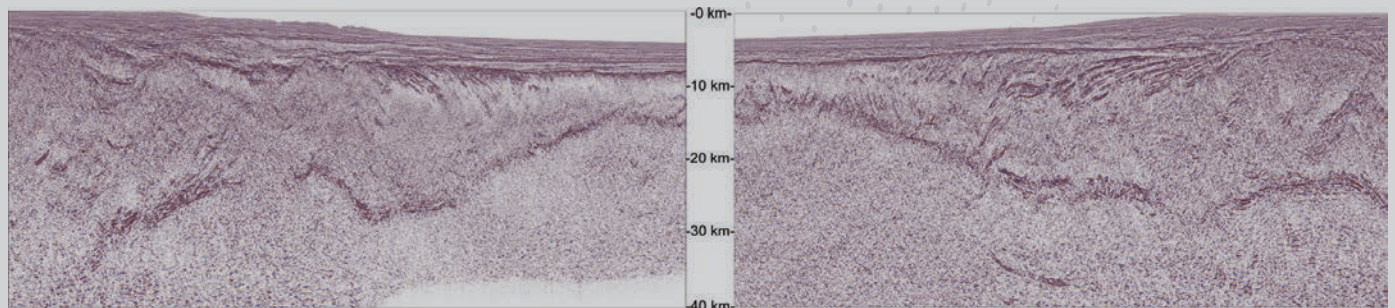
**November 18, 2019**

**9:00-4:30**

Norris Conference Center  
The Pecan Room

**To register, click here.**

Join us for a workshop examining the evolution of the Conjugate Margins from the Equatorial Atlantic to Austral Magma-rich segment. Evaluate both margins as a single basin to understand similarities and differences between the proven and prospective petroleum systems of South America and West Africa. The workshop will focus on interpretation styles and 'hands on' data interpretation exercises to provide attendees with new ideas and insights in to exploration potential in the South Atlantic.



**ion**

[iongeo.com](http://iongeo.com)





*Fang Lin*  
editor@hgs.org

## Volunteering

This month I would like to discuss the topic of volunteering. I know some of you may think “Here it is, again!” when you saw the title. Indeed, it is a very common topic that many of my predecessors have written about. I think many of us would agree that volunteers are critical for the sustainability and prosperity of a professional community like HGS. So, what’s left to talk about?

There are several reasons why I chose this topic. First, let me tell you a little personal story. This month I ran into a friend at an HGS event. I told my friend that I am serving as the Editor of the HGS *Bulletin* for the 2019-2020 year. He said something along the lines of “Congratulations. It is a huge job”, then asked me why I would volunteer for such a demanding position considering how hectic my day to day life already is. I thought that was an excellent question, in fact, it’s a question that I have pondered from time to time as well, particularly when I met other volunteers who have served our community much longer than me. Well, I know why I took this job – I like challenges. I like to do things that I’ve never done in the past, and I see challenging tasks as opportunities to grow. But that’s just me and it still hasn’t stopped me from wondering what others’ thoughts are? What has kept them volunteering through all these years? After all, HGS is an organization that has been run almost completely by volunteers for 96 years!

So, starting this month I would like to invite some of our volunteers to share their volunteering experiences in a new column, called “HGS Volunteers”. This month, I had the honor to have one of our longest serving members, Mr. John Tubb, also an HGS Honorary Life Member, to write about his volunteering experiences. I highly recommend that you read the article by John. I hope that you find it as inspiring and thought-provoking as I have. This is just the beginning. I look forward to seeing more members sharing like this in the future. To be clear, you don’t have to be as experienced

as John to be considered as our next highlighted volunteer. In fact, we would like to hear the stories from volunteers of all levels of experience! Got something that you really want to share? Please contact me at editor@hgs.org.

Speaking of volunteering, do you know how many HGS committees there are? I did not know until recently – we have 45 committees altogether. All these committees are run by volunteers. I still don’t know exactly how many volunteers that we have, but I wouldn’t be surprised if it is in hundreds, maybe even in the thousands! All the volunteers serve on the various committees because of their genuine passion and dedication to the geoscience community. They organize all kind of events to advance the technical knowledge and skills of our members, to provide professional networking opportunities, to engage the general public for better understanding of geosciences and geoscientists, and much more. Many of them are not only informative and educational but they’re fun too! To make the committees and their activities more visible to our members,

starting this month we would also like to introduce another new column called “HGS Committees”. The committee chairs will tell you what they do, and you can consider if that is something you want to be part of, either as volunteers or as participants. This month we are introducing two committees, the Earth Science Week (ESW) Committee and the Museum of Natural Science (MNS) Committee. Their annual highlighted events are both coming up soon (in October and November)! I highly recommend you attend at least some of the events to get your own first-hand experiences within the world of HGS volunteering. I have marked my calendar and hope to have the opportunity to meet some of you in person at the events.

So long for this month. For those in Houston, I hope you are enjoying the start of the cooler season. For those outside of Houston, I wish you all the best no matter where you are. ■

*After all, HGS is an  
organization that  
has been run almost  
completely by volunteers  
for 96 years!*

# “GeoGulf”: What’s in a Name Change

By Mike Erpenbeck, General Chair, GeoGulf 19 Houston

**T**he old GCAGS Convention has been rebranded as GeoGulf. The word has been out for some time now. People know about the rebrand. Many others will learn about it as we ramp up the publicity campaign in the next couple months, the final two months before it hits town on October 23-25. Many younger geoscientists never quite knew what the old designation was all about. “GCAGS-GCSSEPM Convention”? – “Acronyms-R-Us”...It might as well be alphabet soup of some kind. What do the insiders know that we don’t?

The new branding gives us the opportunity to shout it out: **GeoGulf remains the annual convention of all local geological societies comprising the Gulf Coast Association of Geological Societies, whose members work and play in the rocks of the Gulf Coast geological province.** This is my paraphrase of the many promotional “planks” provided to us by the pricey **image/branding consulting firm** we employed to guide us in rebranding this event.

## The Old Event

The “old” GCAGS convention has been held annually for 68 years. It has been a popular annual event, unique in its focus on the Gulf of Mexico area oil and gas industry. Each year it was kicked off by a high energy **Icebreaker** that was designed to get the crowd geared up for a full immersion into two days of Gulf geology. The technical session consisted of up to 100 technical papers **orally presented**, mostly from those geoscientists and professors who were most familiar with onshore and offshore Gulf oil and gas exploration. They were published in the GCAGS *Transactions*, which every year found their way to the bookshelves of nearly every company library. There was a trade show associated with it, **exhibitors** promoted their services and demonstrated cutting edge technology. **Sponsors** demonstrated their commitment to the industry throughout all years of the commodity price cycle by their donations and were amply rewarded by the promotional on-site exhibits and the advertising we provided them. For about 10 years Gulf Coast Section of **SEPM** was a joint partner in the Convention. **Short courses, field trips**. ... All these items were hallmarks of the GCAGS convention. **All these items have been retained in the new annual GeoGulf.**

Make no mistake. GCAGS, *the organization*, still exists and is relevant as it has ever been over its 70-year history. Going forward, the annual GCAGS convention, *the event*, will be known as GeoGulf.

## The New Event

While retaining the core, traditional elements of the historical Convention, the rebranding initiative recognized that substantial “tweaking” would be imperative to address rapidly developing new technologies, new demographics, and new business cultures.



As a commitment to the interests and concerns of early career geoscientists who are at the tip of the spear of these changes, those of us planning GeoGulf 2019 Houston have responded accordingly.

Look for an expansion of short courses and session themes to include some that are, strictly speaking, not Gulf of Mexico focused, such as **data analytics, machine learning, multivariate statistics, geologic creativity, reservoir fluids behavior**, etc. The Environmental Geology sessions are a must for geologists involved in water resources and protection.

We are currently in the process of filling out a slate of panel speakers and discussion coordinator who will address issues on the **business and economic** aspects of geological exploration with implications for career path choices, and another panel for skills and creativity in **career management**.

The evening dinner and entertainment will be tailored to appeal to younger professionals in a networking and socializing atmosphere.

We are planning a student symposium in which students meet with industry professionals and managers in round table discussion groups to learn day-to-day activities in large and small firms, networking, and job search.

A unique exhibit of the sands and conglomerates deposited near downtown Houston by flooding from Hurricane Harvey in August 2007 will be the focal point of the exhibit floor. Guided information of the depositional process will be posted alongside each exhibit. These plastic impregnated sand panels are of museum quality and provide an aesthetic dimension to the Convention.

GeoGulf 2019 Houston will be held on October 23-25 at the Marriott Westchase, 2900 Briarpark Dr., Houston. The suburban setting ensures we will avoid the traffic and parking problems at a downtown convention and hotel venue. A significant benefit: parking is freely available and free!

GeoGulf tackles all the most pressing topics facing the field—from oil, shale and natural gas to Big Data and business strategies—GeoGulf is an indispensable source of education, practice and professional development. Here, you’ll share ideas with fellow thought leaders, delve into the depths of scientific discovery, explore new and emerging research and walk away with the collective knowledge of colleagues and exhibiting companies all committed to advancing the field of geology in the Gulf Coast region. Expand your mind, enhance your career, advance your field—all at GeoGulf 2019 Houston. Check it all out and register at [www.2019.gcagshouston.com](http://www.2019.gcagshouston.com). ■



## GeoGulf Convention Short Courses, October 23, 2019

Convention dates October 24-25, Westchase Marriott Hotel 2900 Briarpark Dr., Houston.

Co-hosted by HGS and GCSSEPM. [2019.gcagshouston.com](http://2019.gcagshouston.com)

All classes are **Wednesday October 23** at the Westchase Marriott (unless noted otherwise)

Full day classes Start 8:30 am end at 4:30 pm. Half day classes are as noted.

All short courses at the Westchase Marriott include a buffet group luncheon.

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### SC01- The Exploration Process After Drilling a Discovery

Instructor: Fred Schroeder Cost: \$250

Includes handouts and group luncheon buffet  
This course provides a one-day introduction to exploration process after a discovery well has been drilled.

<https://2019.gcagshouston.com/sc01-the-exploration-process-after-drilling-a-discovery/>

### SC02- Understanding Deepwater Clastic Facies

Instructor: John Dribus, global geologist and advisor, Schlumberger, retired Cost \$195

The Importance of deep-water clastic petroleum systems in exploration.

More info <https://2019.gcagshouston.com/sc-02-understanding-deepwater-clastic-facies/>

### SC03- Fundamentals of Deepwater Stratigraphy and Reservoirs

Instructor: Jon Rotzien, Basin Dynamics \$195

This seminar presents an integrated view of deep-water stratigraphy and petroleum reservoirs. Deep-water depositional systems form some of the largest petroleum reservoirs on Earth and represent the frontier of oil and gas exploration.

<https://2019.gcagshouston.com/sc-03-fundamentals-of-deepwater-stratigraphy-and-reservoirs/>

### SC04- Principles of Paleogeographic Evolutionary Synthesis (sponsored by GCSSEPM)

Instructor: Jim Pindell, Tectonic Analysis \$195

This one-day short course will examine the methodologies used in paleogeographic reconstruction, focusing on the closely-related Gulf of Mexico, Caribbean, and northern South American basins.

<https://2019.gcagshouston.com/sc-04-principles-of-paleogeographic-evolutionary-synthesis/>

### SC05- Introduction to Machine Learning for Interpreters (Half Day)

Instructor: Rocky Roden, (Rocky Ridge Resources, Inc) Cost \$95

Every day our lives are intertwined with applications, services, orders, products, research, and objects that are incorporated, produced, or effected in some way by Artificial Intelligence and Machine Learning.

<https://2019.gcagshouston.com/sc-05-introduction-to-machine-learning-for-interpreters/>

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Register now at [www.2019.gcagshouston.com](http://www.2019.gcagshouston.com)  
Attendees must register for the conference Oct 24-25 in order to sign up for a short course on Wednesday Oct 23. You cannot register for short classes without conference registration.

**SC06- Creativity for Geoscientists: Insights, Development and Practice (Half Day)**

Instructors: William (Bill) Fairhurst and Charles A. Sternbach Cost: \$95

This course will bring together their research and insights, what AAPG outstanding explorers have to teach us (in their own words), using statistics and analytics to move up the learning curve and predict the future, discovering team creativity through exercises, and timeframe thinking and planning using individual career planning exercises.

<https://2019.gcagshouston.com/sc-06-creativity-for-geoscientists-insights-development-and-practice-half-day/>

**SC07- Advanced Analytics – Understanding the Powers and Pitfalls of Multivariate Statistics for Upstream Oil & Gas**

Instructor: Andrew Silver, AdretLLC Cost \$95

A revival in the popularity of multivariate statistical algorithms has occurred in the oil & gas industry these last few years due to a combination of high-profile use cases and decreasing computing costs.

<https://2019.gcagshouston.com/sc-07-advanced-analytics-understanding-the-powers-and-pitfalls-of-multivariate-statistics-for-upstream-oil-gas-half-day/>

**SC08- Core Workshop: Upper Cretaceous Stratigraphy and Reservoirs of Texas and Louisiana**

Instructors: William A. Ambrose and Robert G. Loucks (Texas Bureau of Economic Geology) Cost \$195

This core workshop will look at Upper Cretaceous stratigraphic section and associated reservoirs in Texas and western Louisiana; including depositional systems, lithofacies, and reservoir characterization.

<https://2019.gcagshouston.com/sc-08-core-workshop-upper-cretaceous-stratigraphy-and-reservoirs-of-texas-and-louisiana-at-the-beg/>

**SC09- Introduction to Petrophysics**

Instructor: Randy Mitchell (PSI) Cost \$95

Quicklook methods for porosity and water saturation estimation

<https://2019.gcagshouston.com/sc-09-introduction-to-petrophysics/>

**SC10- Reservoir Fluids Behavior and Analysis for Earth Scientists**

Instructor: Toddy Guidry, Core Lab Cost \$95

The only exposure a geologist gets to fluids is hearing the reservoir engineer ‘talk’ about getting ‘PVT samples’. This ½ day short course will take a detailed look at fluids behavior, sampling, analysis, production trends and cover experimental methods performed as part of the blueprint for a comprehensive fluids program.

<https://2019.gcagshouston.com/sc-10-reservoir-fluids-behavior-and-analysis-for-earth-scientists-half-day/>

**SC11- A User’s Guide to Micropaleontology and Biostratigraphy: Applications in Research and Industry (sponsored by GCSSEPM)**

Instructors: Thomas D. Demchuk (RPS Group Inc./Louisiana State University: Houston, TX), Ryan Weber (PaleoData Inc.: New Orleans, LA), Rebecca Hackworth (Chevron, Houston, TX) Cost \$95

“How to use your paleontologic information to its fullest advantage”

<https://2019.gcagshouston.com/sc-11-a-users-guide-to-micropaleontology-and-biostratigraphy-gcssepm/>

**SC12- Reservoir Modeling and Production Forecasting**

Instructor: W. Scott Meddaugh, Professor, McCoy College of Science, Wichita Falls, Texas Cost \$195

Reservoir Modeling and Production Forecasting with a Focus on Application to Large and Not-so-Large Reservoirs.

<https://2019.gcagshouston.com/sc-12-reservoir-modeling-and-production-forecasting/>



## GeoGulf Convention Field Trips Saturday October 26

Field Trips (buses leave 8:30 am and return 4:30 pm unless noted otherwise)

Read More at <https://2019.gcagshouston.com/field-trips/>

**Field Trips Saturday October 26. Trips leave by bus from the Westchase Marriott at 8:30am.**

**FT 1 Hands-on Geophysical Data Acquisition-** Dr. Robert Stewart- Cost \$175.00

**FT 2 World Class and Spectacular Late Cambrian Microbial Reef Outcrops in Mason County, Texas** (Friday to Sunday) Dr. Andre Droxler, 3 days, \$600.00 (this trip leaves Friday Oct 25)

**FT 3 Upper Texas Coastal Barrier Dynamics: Observations Used in Digital Modeling,** Dr. Jeff Nittrouer, John Anderson- Cost \$150.00

**FT 4 Surface Faults in West Houston,** Carl Norman and Richard Howe (HGS) \$150.00

**FT 5 Visit the Hockley Salt Mine and Discover the Pleistocene Mega-Fauna Fossils from Northwest Harris County** Ken Theis \$150.00

**FT 6 Artistic, Human Impact and Geologic Investigation of Hurricane Harvey's Deposits Near Downtown Houston ,** Jerry Kendall \$95.00 (half day)

**FT 7 Panther Creek Outcrops and Fossil Collecting,** Constantin Platon \$95.00 (half day )

### Special Science Museum Tour

**Wednesday October 23. Bus leaves Westchase Marriott at 9:00 am returns 3:00 pm. Guided Tour of the Houston Museum of Natural Science – Sandy Rushworth \$60.00** (for geologists and non-geologists/families)

To attend the field trips, attendees must register for the GeoGulf Convention and add the field trip to your check out online cart.

Check [www.2019.gcagshouston.com](http://www.2019.gcagshouston.com) for link to the registration site.

Join us for the First Annual HGS-GSH

# Family & Friends Fall Fun Day

Bring your family for an afternoon of GEO-FUN!

Saturday, October 5, 2019 noon to 6 PM

Rob Fleming Recreation Center

6464 Creekside Forest Drive in The Woodlands, TX ★

To guarantee lunch, pre-register by 5 pm October 3

<https://www.hgs.org/civicrm/event/info?id=2142>

Or call the HGS Office: 713-467-9476

**\$25/adult** Children must be registered

**\$10/child** ages 13 - 18,

**FREE** 12 and under

- **Lunch from Mel's Country Café starts at ~12:15** : bbq beef & chicken, sides; tenders & mac & cheese available for young kids
- Soft drinks, juices & water
- Root Beer Ice Cream Floats 2 pm and 4 pm
- Indoor facility - weather not an issue!
- ✓ Cool Gee-whiz vendor displays to show family & friends what we do in our jobs – seismic, well logs, cores, drill bits, mudlogs
- ✓ Kid Centered Geoscientific Activities such as Dino and Gem Dig, Texas Fossils
- ✓ Drawings for surprise “Geo-stuff” every 20 to 30 minutes!
- ✓ **Networking**

## Help Needed:

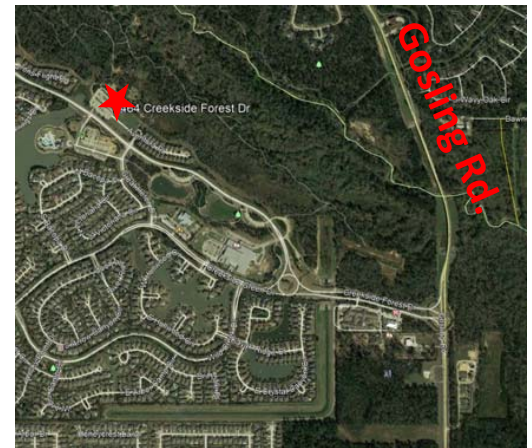
- Volunteers for many planning functions & on event day
- Corporate Sponsors for \$200 to display their gee-whiz wares
- All donations welcomed

Call to volunteer and sponsor

Event Chairman: Lanette Marcha – [lmarcha@Hotmail.com](mailto:lmarcha@Hotmail.com) – 832-808-0263

Helper: Cheryl Desforges – [cheryldesforges@Hotmail.com](mailto:cheryldesforges@Hotmail.com) – 713-816-9202

HGS Office: 713-467-9476



## Thanks to our sponsors



**For only \$200, please SPONSOR THE FIRST HGS-GSH**

# **Family & Friends Fall Fun Day**

**Saturday, October 5, 2019 noon to 6 PM**

**Rob Fleming Recreation Center  
6464 Creekside Forest Drive  
The Woodlands, TX**



- Indoor facility - weather not an issue!
- Large parking lot and nearby overflow lots

- ✓ **Not only is this event a great place to *network and socialize*, it is an opportunity for vendor sponsors to 1) display their “gee-whiz” products that geoscientists use in daily jobs to show our family & friends and 2) **market their products & services!****  
- seismic, well logs, cores, drill bits, mudlogs, to name a few!
- ✓ **Non-designated cash sponsors are also greatly appreciated!**
- ✓ **All Sponsors will be recognized in all event ads and at the event.**

Company \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Address \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_ Postal Code \_\_\_\_\_ Country \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_ Web Site \_\_\_\_\_

Type of display you will bring: \_\_\_\_\_

Display requirements:

- A table?                      Yes    No  
 Electricity?                    Yes    No  
 A parking Space?            Yes    No  
 Other? \_\_\_\_\_

**Mail** completed form along with your **check** made out to:

HGS memo: 2019 Family & Friends Fall Fun Day/Sponsorship

Houston Geological Society • 14811 St. Mary’s Lane, Suite 250 • Houston, TX 77079 USA **OR**

**Email form & 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

## **All Help Welcomed:**

- Help w/ planning functions & on event day (set-up, take down, hand out root beer floats...)
- Sponsors to display their gee-whiz wares
- Non-vendor Sponsors

Call/email to volunteer and sponsor

Event Chairman: Lanette Marcha – [lmarcha@hotmail.com](mailto:lmarcha@hotmail.com) – 832-808-0263

Helper: Cheryl Desforges – [cheryldesforges@hotmail.com](mailto:cheryldesforges@hotmail.com) – 713-816-9202

HGS Office: 713-467-9476



# HGS GOLF TOURNAMENT

## Monday – October 21, 2019

### Sterling Country Club and Houston National Golf Club

### 4-man Scramble

Come join us for golf, food, friends and fun at the annual HGS Golf Tournament at our new location, **Sterling Country Club** and **Houston National Golf Club** ([www.sccathn.com](http://www.sccathn.com)). There will be prizes awarded for closest to the pin and long drive as well as many great door prizes for participants.

**Entry Fee:** \$175.00/Golfer or \$700.00/Team.  
**Early Bird Special:** Sign up before September 23rd to receive a discount of \$25.00/Golfer or \$100/Team.  
**Entry Deadline:** October 14th.

Individual entries will be grouped with other individual golfers to make a foursome. Entries are limited to and will be accepted on a first-in basis.

**Companies or individuals interested in sponsoring the event should contact Elliot Wall at [elliott.wall@corelab.com](mailto:elliott.wall@corelab.com) and [copy.office@hgs.org](mailto:copy.office@hgs.org) Sponsorship deadline is September 30th.**

#### SCHEDULE OF EVENTS

8:00 – 9:45 a.m. Registration and free use of driving range and mini games, breakfast provided  
 10:00 a.m. Shotgun start  
 3:00 p.m. Cash bar, open buffet  
 3:30 p.m. Door prizes and awards presentation



#### REGISTRATION OPTIONS

**Online:** <https://www.hgs.org/civicrm/event/info?id=2095&reset=1>

**Email:** [office@hgs.org](mailto:office@hgs.org) and [elliott.wall@corelab.com](mailto:elliott.wall@corelab.com)

**Mail:** Houston Geological Society, 14811 St. Mary's Lane, Suite 250, Houston, TX 77079  
*If paying by check, please make check payable to HGS or Houston Geological Society.*

Team Captain \_\_\_\_\_ Phone \_\_\_\_\_ Amount Enclosed \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

Billing Address \_\_\_\_\_

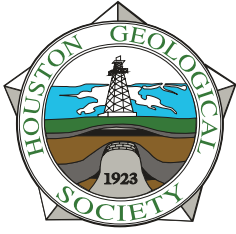
Credit card # \_\_\_\_\_ Exp. Date \_\_\_\_\_ Code# \_\_\_\_\_

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

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

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





# HGS GOLF TOURNAMENT

Monday – October 21, 2019  
Sterling Country Club and  
Houston National Golf Club

## SPONSORSHIP APPLICATION

### TREVINO SPONSORSHIP \$250.00

- **Sponsor Logo** signs on courses.
- **Company Name** displayed on sponsor recognition board at registration and awards banquet.
- **No Complimentary Registration**

### HOGAN SPONSORSHIP \$500.00

- **Sponsor logo** signs on courses.
- **Company logo** displayed on sponsor recognition board at registration and awards banquet.
- **1 Complimentary Registration**

### NICKLAUS SPONSORSHIP \$1,000.00

- **Sponsor Logo** signs on courses.
- **Company Logo prominently** displayed on sponsor recognition board at registration and awards banquet.
- **Company logo** displayed on driving range and practice putting green signs.
- **2 Complimentary Registrations**

### TITLE SPONSORSHIP \$2,000.00

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



### SPONSORSHIP REGISTRATION OPTIONS – Deadline October 15th

**Online:** <https://www.hgs.org/civCRM/event/info?id=2095&reset=1>

**Email:** office@hgs.org and elliot.wall@corelab.com

**Mail:** Houston Geological Society, 14811 St. Mary’s Lane, Suite 250, Houston, TX 77079

*If paying by check, please make check payable to HGS or Houston Geological Society.*

Name \_\_\_\_\_ Phone \_\_\_\_\_ Amount Enclosed \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

Billing Address \_\_\_\_\_

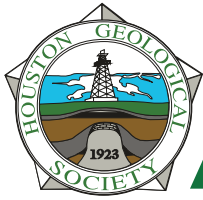
Credit card # \_\_\_\_\_

Exp. Date \_\_\_\_\_ Security Code# \_\_\_\_\_

**Please email your company logo to office@hgs.org and elliot.wall@corelab.com.**

**Note: Company logos (high resolution file) must be received no later than October 15th.**

**If there are any questions, please contact Andrea Peoples or Jacky Jordan at 713-463-9476.**



# Applied Geoscience Conference

November 6-7, 2019

SOUTHWESTERN ENERGY • 10000 Energy Drive • Spring, TX 77389



## Applied Geomechanics: Through the Life Cycle of the Field

- Day 1 AM Session 1      Accessing Targets Faster with Safer Wellbores
- Lunch Keynote**            **Robert W. Zimmerman**, *Imperial College, London*
- Day 1 PM Session 2      Optimizing Completion Footprint and Stimulation Designs

---

- Day 2 AM Session 3      Post-stimulation Diagnostics and Monitoring
- Lunch Keynote**            **Tony Settari**, *CGG Services (Canada) Inc.*
- Day 2 PM Session 4      Extending the Life of the Field: Production, Refracturing, and EOR

*University Poster Session represented by: Georgia Tech, Oklahoma State University, Purdue University, The University of Oklahoma, The University of Texas, University of Calgary, University of Houston, Utah State University*

**This Fourth Applied Geoscience Geomechanics Conference (since 2013) by an industry expert committee provides the highest value through invited subject matter experts represented by:**

*Baker Hughes, a GE company; CGG; CARBO Ceramics; Excellence Logging; FracGeo; Halliburton; Optasense; Saudi Aramco; Schlumberger; Weatherford*

### Cost structure

*General registration: July 1 – November 5, 2019*

HGS member \$400.00

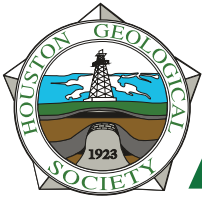
Non-member \$455.00

HGS student member \$75.00

*Note: Unemployed HGS members contact the office for discount*

**For more information please visit [www.hgs.org](http://www.hgs.org) or contact the HGS office: [office@hgs.org](mailto:office@hgs.org)**



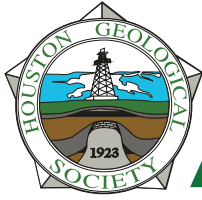


# Applied Geoscience Conference

November 6-7, 2019

## Oral Presentations – Wednesday, November 6, 2019

<b>7:00</b>	<b>Registration and Coffee</b>	
<b>8:00 - 8:10</b>	<b>Welcome and Opening Remarks:</b> Jon Blickwede, <i>HGS President</i> ; Umesh Prasad, <i>Baker Hughes, a GE company</i> ; SWN representative	
<b>Session 1: Accessing Target Faster with Safer Wellbores</b> <b>Chairs:</b> Lauren Cassel, <i>Completion Imaging Analysis</i> ; Mark Herkommer, <i>Excellence Logging</i>		
<b>8:10 - 8:45</b>	Advanced Seismic Inversion for Geomechanics Applications in Unconventional Reservoirs	<b>Colin Sayers</b> , <i>Schlumberger</i>
<b>8:45 - 9:20</b>	Lost-in-hole Diagnostics and Mitigation	<b>Agus Tjengdrawira</b> , Julie Kowan, and Namsu Park, <i>Baker Hughes, a GE company</i>
<b>9:20 - 9:40</b>	<b>Coffee, Posters, Exhibits</b>	
<b>9:40 - 10:15</b>	Laboratory Modelling of Salt Deformation and its Correlation with Drilling Mechanics of Record Hybrid Drill Bit Runs in the GOM	<b>Ashabikash Roy Chowdhury</b> , Umesh Prasad and Ryckman Callais, <i>Baker Hughes, a GE company</i>
<b>10:15 - 10:50</b>	Novel Pore Pressure Prediction Technique for Unconventional Reservoirs	<b>Robert Raney</b> , David P. Yale and Adriana Perez, <i>Geomechanics Consulting</i>
<b>10:55 - 11:55</b>	<b>Open Floor Discussion &amp; Posters</b>	
<b>11:55 - 1:00</b>	<b>Lunch, Posters, Exhibits</b>	
<b>12:15 - 1:00</b>	<b>Chair:</b> Deepak Gokaraju, <i>Metarock Laboratories</i> <b>Keynote:</b> Failure of Anisotropic Rocks such as Shales, and Implications for Borehole Stability	<b>Robert W. Zimmerman</b> and Widad Al-Wardy, <i>Dept. of Earth Science and Engineering, Imperial College of Science, Technology and Medicine, London, UK.</i>
<b>Session 2: Optimizing Completion Footprint and Stimulation Designs</b> <b>Chairs:</b> Ashwani Zutshi, <i>Schlumberger</i> ; Mark Morford, <i>FracGeo</i>		
<b>1:05 - 1:40</b>	Digital Rock Simulation: A Novel Approach for Accurate Characterization of Perforation Tunnel Damage	<b>Rajani Satti</b> , <i>Baker Hughes, a GE company</i>
<b>1:40 - 2:15</b>	Digital Twins for Drilling Fluid and How Digitalization Could Help to Reduce the Cost and Increase the Wellbore Stability	Mehrdad G Shirangi, <b>Reza Etehad</b> , and Charles A Thompson Jr, <i>Baker Hughes, a GE company</i>
<b>2:15 - 2:35</b>	<b>Coffee, Posters, Exhibits</b>	
<b>2:35 - 3:10</b>	Stress Sensitivity of Sonic Wave Velocity and the Reliability of Sonic Tools in Unconventional Tight Gas Sand Reservoirs	Dr. Christophe Germay and <b>Tanguy Lhomme</b> , <i>EPSLOG</i>
<b>3:10 - 3:45</b>	Characterizing Off-Normal Occurrence and Leakage Risk at Underground Natural Gas Storage Facilities	<b>Richard A. Schultz</b> , <i>Orion Geomechanics</i>
<b>3:45 - 4:45</b>	<b>Open Floor Discussion &amp; Posters</b>	



# Applied Geoscience Conference

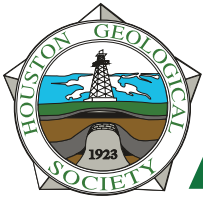
November 6-7, 2019

## Oral Presentations – Thursday, November 7, 2019

7:00	<b>Registration and Coffee</b>	
8:00 - 8:10	<b>Welcome and Opening Remarks:</b> Umesh Prasad, <i>Baker Hughes, a GE company</i>	
<b>Session 3: Post-stimulation Diagnostics and Monitoring</b> <b>Chairs:</b> David Katz, <i>Baker Hughes, a GE company</i> ; Jing Zhang, <i>The University of Oklahoma PhD Student</i>		
8:10 - 8:45	Geomechanics of Unconventional Hydraulic Fracturing: Clusters, Complexity, “Frac-Hits” and All That	<b>Ahmad Ghassemi</b> , <i>The University of Oklahoma</i>
8:45 - 9:20	Estimation of Propped Fracture Geometry Using Electromagnetic Geophysics	<b>Terry Palisch and Souvik Mukherjee</b> , <i>CARBO Ceramics</i>
9:20 - 9:40	<b>Coffee, Posters, Exhibits</b>	
9:40 - 10:15	Near and Far Field DAS Diagnostics for Unconventional Reservoir Monitoring	<b>Andres Chavarria</b> , <i>Optasense</i>
10:15 - 10:50	Early Warning Systems – Using PTA Analysis of DFITs to Understand Complex Hydraulic Fractures and Optimize Treatment Designs	<b>Bob Bachman</b> , <i>CGG</i>
10:55 - 11:55	<b>Open Floor Discussion &amp; Posters</b>	
11:55 - 1:00	<b>Lunch, Posters, Exhibits</b>	
12:15 - 1:00	<b>Chair:</b> Deepak Gokaraju, <i>MetaRock Laboratories</i> <b>Keynote:</b> Integrating Geology and Geophysics into Engineering Workflows to Enhance Unconventional Production <b>Poster Winner Awards</b>	<b>Tony Settari</b> , <i>CGG Services (Canada) Inc.</i>
<b>Session 4: Extending the Life of the Field: Production, Refracturing, and EOR</b> <b>Chairs:</b> Barbara Hill, <i>Schlumberger</i> ; Chi Vinh Ly, <i>CGG</i>		
1:05 - 1:40	Role of Multiple Fracturing of Vertical And Horizontal Wells in Maximizing Production and Extending Life of the Field	<b>Mohamed Soliman</b> , <i>University of Houston</i>
1:40 - 2:15	Limits on the Accuracy of Pore Pressure Estimates by Analysis of Random Measurement Error and Means for Improvement	<b>Mark Herkommer</b> , <i>Excellence Logging</i>
2:15 - 2:35	<b>Coffee, Posters, Exhibits</b>	
2:35 - 3:10	Extending the Life of Enhanced Permeability Zones Created During Hydraulic Fracturing	Ron Dusterhoft, <b>Zeno Philips</b> and U. Inyang, <i>Halliburton</i>
3:10 - 3:45	Predrill Pore Pressure Estimation in Wildcat Prospectivity	<b>Saad T. Saleh</b> , <i>GEOMECH, USA</i>
3:45 - 4:45	<b>Open Floor Discussion &amp; Posters</b>	
<b>Closing Comments</b>		

### Poster Session

*Invited Presentations from Graduate Students • Open during Coffee and Lunch Breaks*



# Applied Geoscience Conference

November 6-7, 2019

## Posters – November 6-7, 2019

Poster Session Chair: Mike Effler

University	Student Name	Poster Topic
Georgia Institute of Technology	<b>Ming Lui</b>	Poroelectric Indentation – Feasibility of a New Testing Method for Tight Rocks
Oklahoma State University	<b>Jingyao Meng</b>	Geomechanical Characteristics of the Prospective CO <sub>2</sub> Sinks and Seals, Eastern Gulf of Mexico
Purdue University	<b>Wenging Wang</b>	Heterogeneous Stress State in the Crystalline Crust Beneath the Western Canadian Sedimentary Basin: Observations from Borehole Image Logs to 2.4 km
The University of Oklahoma	<b>Zhi Ye</b>	The Role of Pre-Existing Fractures in Shale Reservoir Stimulation
The University of Oklahoma	<b>Juan Acosta</b>	Study of Creep Behavior in Barnett Shale Using Nano-Indentation
The University of Texas	<b>Mehdi Teymouri</b>	Coupled Hydro-Mechanical Analyses and Modeling for Reliable Characterization of Fracture Propagation in Anisotropic and Spatially Heterogeneous Formations
The University of Texas	<b>Shivam Agrawal</b>	Effect of Rock Heterogeneity at Different Length Scales on Fracture Geometry
University of Calgary	<b>Marco Venieri</b>	Predicting Reservoir Potential of Unconventional Shale Plays from Wireline Logs: A Correlation Between Compositional and Geomechanical Properties of the Devonian Duvernay Formation, Alberta, Canada
University of Houston	<b>Abdullah Bilal</b>	Predicting Static Data, Using Dynamic Properties and Quantitative Sample Characterization
University of Houston	<b>Suresh Dande</b>	Elastic Properties of Propped and Unpropped Eagle Ford Shale and 3D-printed Fractured Rock Models
University of Houston	<b>Rongrong Lin</b>	A Damped Dynamic Finite Difference Approach for Modeling Static Stress-Strain Fields
University of Houston	<b>Sabyasachi Prakash</b>	Analysis of Unconsolidated Sands' Yielding Behavior Under Unloading Conditions

### Participating Schools

Georgia Institute of Technology • Oklahoma State University  
 Purdue University • The University of Oklahoma  
 The University of Texas • University of Calgary  
 University of Houston

# Sponsorship Opportunities

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

To Sponsor, please contact Andrea Peoples  
office@hgs.org or 713.463.9476

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

Opportunities	Platinum Sponsors \$10,000	Gold Sponsors \$5,000	Silver Sponsors \$2,500	Bronze Sponsors \$1,000
Logo on Sponsorship Banners	✓	✓	✓	✓
Advertisement in Program Book	Full Page	1/2 Page	1/4 Page	1/8 Page
Complimentary Full Registrations	6	3	2	1
Complimentary Vendor Booth	✓	✓		
Recognition by HGS in Program Book, onsite signage, post show highlights and thank you in the HGS <i>Bulletin</i>	✓	✓	✓	✓
Recognition in Conference Announcements and Website (logo with hyperlink)	✓	✓	✓	✓

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

For more information and to register please visit: [www.hgs.org](http://www.hgs.org)



# Applied Geoscience Conference

November 6–7, 2019

## Applied Geomechanics: Through the Life Cycle of the Field

To sponsor, please indicate your sponsorship level \_\_\_\_\_ with payment (payable to HGS) to:  
*HGS, 14811 St. Mary's Lane, Ste. #250 - Houston, Texas 77079 - Attn: Andrea Peoples*, or you can email your  
sponsorship form to [office@hgs.org](mailto:office@hgs.org).

Name \_\_\_\_\_ Phone \_\_\_\_\_ Amt. Enclosed \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

Billing Address \_\_\_\_\_

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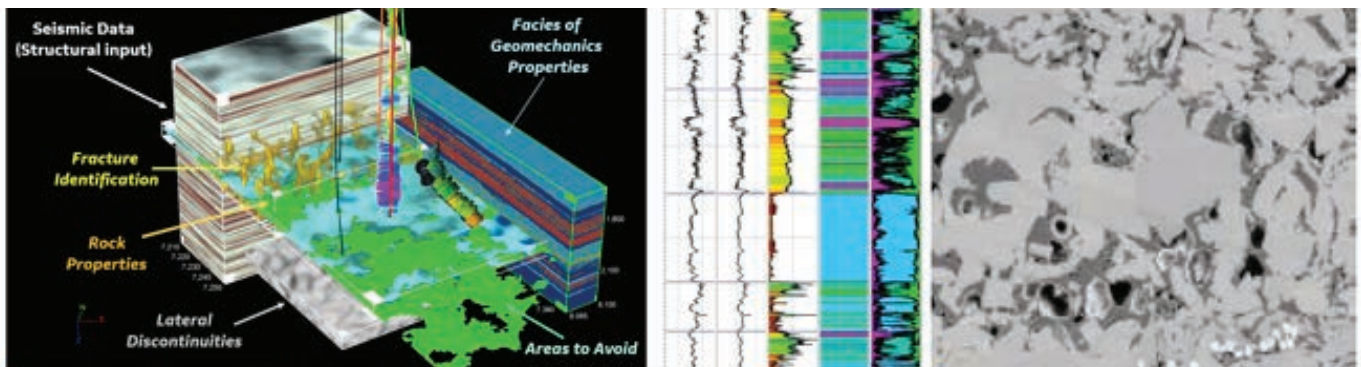
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Please email your company logo to [office@hgs.org](mailto:office@hgs.org). Note: Please send only company logos at 300+dpi



For more information please visit: [www.hgs.org](http://www.hgs.org)

**EAGE**

EUROPEAN  
ASSOCIATION OF  
GEOLOGICAL ENGINEERS



# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

South American Petroleum Plays for Future Decades of the Third Millennium

19-20 NOVEMBER 2019 • NORRIS CENTER, HOUSTON TX, UNITED STATES



# WELCOME TO

## the First HGS/EAGE Conference on Latin America themed “South American Petroleum Plays for Future Decades of the Third Millennium”

We are pleased to welcome you to the 1<sup>st</sup> HGS/EAGE meeting on Latin America that will take place in Houston, USA from 19–20 November 2019. We are excited to offer you this interesting event in Houston. It will bring together the knowledge of two well known societies, namely HGS and EAGE, the European Association of Geoscientists and Engineers.

While the petroleum industry is still experiencing the biggest economic downturn seen for decades, our industry-based colleagues and academics continue to bring new tools, influence and understanding to exploration and production activities. The world needs energy and therefore it needs you to participate in events like this. The downturn also offers opportunities especially in the field of new technologies and efficiency.

We strongly believe that the joint HGS/EAGE 2019 event will bring together a strong, successful conference focused on Latin America and widely attended by academic and industry participants. We are preparing a program with broad appeal, scientific focus, and networking opportunities. We are expecting 300 participants from the US, Europe, and Latin America with oral and poster presentations. In addition, an exhibition is present to facilitate knowledge transfer and business among the Geoscience community.

On behalf of the committee, we hope to see you in Houston!

**Cheryl Desforges, Mariela Araujo Fresky, and Steven Getz**  
*Conference chairs*

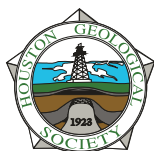
## EAGE

The European Association of Geoscientists and Engineers (EAGE) is a global professional, non-profit association for geoscientists and engineers with 19,000 members worldwide. The objective is to collect and distribute technical knowledge. EAGE organizes events and publishes a monthly magazine for its members and 5 scientific journals. All members of EAGE are professionally involved in (or studying) geophysics, petroleum exploration, geology, reservoir engineering, mining, and mineral exploration, civil engineering, tunneling and environmental matters. EAGE's Head Office is located in the Netherlands with regional offices in Moscow, Dubai, Kuala Lumpur, and Bogota.

## HGS

The Houston Geological Society is a professional society for petroleum, energy, and environmental geoscientists. The HGS supports continuing education, networking, outreach to students, student scholarships and young professional activities, such as neoGeos. HGS organizes multiple monthly events and publishes a monthly magazine for its members. This monthly magazine is also published in the AAPG Datapages.

HGS is comprised mainly of petroleum geologists (but some are mining and environmental geologists.) Our associated members (who are not degreed geologists) include: geophysicists, petrophysicists, engineers (petroleum and civil) as well as mineral explorationists and environmentalists. Headquarters for the HGS is in Houston, Texas.



**EAGE**  
EUROPEAN  
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ENGINEERS

# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

19-20 NOVEMBER 2019

## Oral Presentations – Tuesday, November 19, 2019

<b>7:00</b>	<b>Registration and Coffee</b>	
<b>8:00 - 8:05</b>	<b>Introduction</b>	
	<b>Business Side of Exploration</b>	
<b>8:05 - 8:40</b>	Diversity of Opportunity Drives Exploration Activity and Value	<b>Alana Tischuk</b> , <i>Wood Mackenzie</i>
	<b>Regional Plays and Source Rock</b>	
<b>8:40 - 9:15</b>	Greater Caribbean Petroleum Systems	<b>Craig Schiefelbein</b> , <i>Geochemical Solutions International (GSI)</i> and <b>William Dickson</b> , <i>DIGs</i>
<b>9:15 - 9:50</b>	The Lone Ranger or a Posse of Prospects? A Deepwater Playground from Guyana to Cape Town	<b>William Dickson</b> , <i>DIGs</i> ; <b>Craig Schiefelbein</b> , <i>Geochemical Solutions International (GSI)</i> and <b>David Rajmon</b> , <i>Geosphix</i>
<b>9:50 - 10:05</b>	Break	
	<b>Exploration Plays: Uruguay – Argentina</b>	
<b>10:05 - 10:40</b>	New deepwater Clastic Upper Springhill Play in Malvinas Basin, Offshore Argentina	<b>Swati Ghoshal</b> , <b>Michael Vinson</b> , <b>Gabriel Ritter</b> , <b>Tomieka Searcy</b> and <b>Ross Benthien</b> , <i>BP America</i>
<b>10:40 - 11:15</b>	Offshore Northern Argentina – A New Frontier	<b>Steve DeVito</b> , <i>TGS</i>
<b>11:15 - 11:50</b>	Solving the Passive Margin Play Map Paradox Offshore Uruguay – The Value Density Proposition	<b>Katya Casey</b> , <i>Actus Veritas Geoscience LLC</i>
<b>11:55 - 1:20</b>	<b>Lunch: Keynote Address</b>	
	Shell Upstream Argentina: Creating Value through Technical and Operational Excellence in a Global Super Basin	<b>Ed Kruijs</b> , <i>Shell</i>
<b>1:20 - 1:55</b>	Remote Sensing 2.0: Innovative Multispectral Satellite Data Analytics	<b>James Reardon</b> , <b>Dmitry Vilbaum</b> and <b>Alexandre Agaian</b> , <i>Terra Energy and Resource Technologies</i> and <b>Scott C. Sechrist</b> , <i>Acoustic Geoscience Consulting</i>
	<b>Exploration Plays: Brazil</b>	
<b>1:55 - 2:30</b>	Deep Learning Assisted Seismic Interpretation Technology Applied to Evaporite Sequences: Case Study Offshore Santos Basin	<b>Ana Krueger</b> , <b>Paul Endressen</b> , <b>Bode Amoboya</b> and <b>Benjamin Lartigue</b> , <i>BlueWare Inc</i>
<b>2:30 - 2:45</b>	Break	
<b>2:45 - 3:20</b>	Deepwater Santos Basin: Huge Undrilled Pre-Salt Potential	<b>Cian O'Reilly</b> and <b>James Keay</b> , <i>TGS</i>
<b>3:20 - 3:55</b>	Cretaceous Plays of Deep-Water Foz do Amazonas Basin and Amazon Cone Area, North Brazil: Analog Petroleum Systems of the Equatorial Atlantic Passive Margins	<b>Lucia Torrado</b> , <i>AGI Exploration, LLC</i>
	<b>Exploration Plays: Venezuela – Guyana</b>	
<b>3:55 - 4:30</b>	Guyana-Suriname Deep Water Hydrocarbon System, Three Rivers and Two Source Rocks	<b>Ken Nibbelink</b> , <b>Dick Boyce</b> , <b>Mosab Nasser</b> and <b>John Boyce</b> , <i>JHI Associates, Inc (BVI)</i>
<b>4:30 - 5:05</b>	Sand Characterization and Provenance of the Guyanese Rivers – Implications for Offshore Sediment Development	<b>Ross Taylor</b> , <i>CGG</i>



# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

19-20 NOVEMBER 2019

## Oral Presentations – Wednesday, November 20, 2019

<b>7:00</b>	<b>Registration and Coffee</b>	
<b>8:00 - 8:05</b>	<b>Introduction</b>	
	<b>Business Side of Exploration</b>	
<b>8:05 - 8:40</b>	Another Cycle for Latin America's Upstream Sector?	<b>Maria Cortez, Wood Mackenzie</b>
	<b>Exploration Plays: Venezuela – Guyana</b>	
<b>8:40 - 9:15</b>	The Cretaceous Source Rocks from East Venezuela, Trinidad, Guyana/ Suriname Basins, NE South America	<b>Francia Galea Alvarez, Actus Veritas Geoscience, LLC</b>
<b>9:15 - 9:50</b>	Insights into the Geological Framework of Northeastern South America	<b>Marel Sanchez, Actus Veritas Geoscience, LLC</b>
<b>9:50 - 10:05</b>	Break	
	<b>Regional Plays of the Caribbean</b>	
<b>10:05 - 10:40</b>	The Case for Paleogene Convergent Tectonism Along Northern South America BEFORE Diachronous Oblique Caribbean Collision	<b>Jim Pindell and Diego Villagomez, Tectonic Analysis Ltd</b>
<b>10:40 - 11:15</b>	An Emerging Play in the Caribbean: Tertiary Carbonate Buildups	<b>Peter Lanzarone, Carlos Louzada, Stefan Punnette, Hui Jin, Michael Vinson, Jesse Koch and Scott Lepley, BP America</b>
<b>11:15 - 11:50</b>	Character of the Caribbean Crust Revealed: Observations of New and Reprocessed Seismic Data	<b>Kyle Reuber, Jim Pindell, Antara Goswami, Mattie Friday, Chuck Campbell, Andy Bliss and Brian Horn; ION E&amp;P Advisors and Tectonic Analysis Ltd</b>
<b>11:55 - 1:20</b>	<b>Lunch: Keynote Address</b>	
	Energy Opportunities in Latin America: Investing Through the Political Cycles	<b>Richard Chuchla, Energy and Earth Resources Graduate Program, Jackson School, UT Austin</b>
	<b>Central America and Western Caribbean</b>	
<b>1:20 - 1:55</b>	Petroleum Potential of the Colombia Basin: Insights from New Rock Evaluation Analyses for Regional Seismic Observations	<b>Luis Carlos Carvajal-Arenas and Lucia Torrado, AGI Exploration LLC, and Paul Mann, Earth and Atmospheric Sciences, The University of Houston</b>
<b>1:55 - 2:30</b>	Structural Evolution and Hydrocarbon Prospectivity in Offshore Panama in the Caribbean	<b>Antara Goswami, Jim Pindell, Robert Erlich, Kyle Reuber, Tim Matava and Andy Bliss, ION E&amp;P Advisors, Tectonic Analysis Ltd and Cayo Energy LP</b>
<b>2:30 - 2:45</b>	Break	
<b>2:45 - 3:20</b>	Exploration Potential of the Northern Offshore Region of Jamaica	<b>Gregg H. Blake, Blake Geological Services, LLC, and Raymond Thompson, Herona Thompson and Brian Richardson, Dept of Oil and Gas, PCJ</b>
<b>3:20 - 3:55</b>	Late Cretaceous–Cenozoic Paleogeographic Evolution of the Nicaraguan Platform, Western Caribbean Sea: Implications for Hydrocarbon Potential	<b>Lucia Torrado and Luis Carlos Carvajal-Arenas, AGI Exploration, LLC</b>
<b>3:55 - 4:30</b>	The Petroleum Geology of Offshore Honduras	<b>Christopher Matchette-Downes, CaribX (UK) Limited</b>
<b>4:30 - 5:05</b>	Petroleum Geology and Potential of Guatemala	<b>Mark R. Bitter, Marbit Geoconsulting, LLC</b>

# EXHIBITING OPPORTUNITIES

Main reason for exhibiting:

- Meet existing and acquire new customers
- Introduce new products and services
- Demonstrate your technology and equipment
- Monitor the competition!
- Expand your network

## Exhibitors benefits

When booking a stand for HGS/EAGE 2019 exhibitors will benefit from the following:

- 2 exhibitors passes good for admittance to the exhibit hall only
- Exposure on the EAGE and HGS website
- Free access to the receptions
- Free lunches

To secure booth space, please complete the contract at the end of this guide and send it to us by email ([office@hgs.org](mailto:office@hgs.org)). Please note that all incoming contracts will be handled on first come first served basis.

# SPONSORING OPPORTUNITIES

With an array of unique promotional opportunities, we can help you design the perfect program to enhance your company's experience at HGS/EAGE 2019.

## Why become a sponsor

When you are a corporate sponsor you get high visibility in a qualitative and uncluttered environment that makes your message stand out. HGS and EAGE events are synonymous with quality, with proven track records in the past. The HGS/EAGE 2019 program offers a diverse menu that will surely help you reach your target audience.

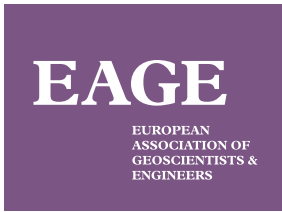
Sponsoring will enable you to:

- Increase your visibility before a national, regional and international audience.
- Enhance your corporate image.
- Reach an influential, exclusive audience.
- Break through the media clutter.
- Associate your company with HGS and EAGE

**CONTACT US FOR MORE INFORMATION**

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# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

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**Questions:** HGS Office Telephone: +1 (713) 463-9476; Fax: +1 (281) 679-5504; Email: office@hgs.org  
 Mail or email the completed form along with your check made out to: Office@hgs.org :  
 2019 Latin America 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

## 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.

**Exhibitor's booth fee of \$2,000.00**

EXHIBIT SPACE ORDER \$2000.00 per 10' X 10' booth space: \_\_\_\_\_ booth(s) + \_\_\_\_\_ presentation(s) = \$ \_\_\_\_\_

**Contact the HGS office for booth selection 713-463-9476** 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 venue, HGS will send out the required form.)

## SPONSORSHIP OPPORTUNITIES

GOLD	SILVER	Sponsorship Opportunities	Sponsorship Amount
<input type="checkbox"/> \$10,000	\$5,000	Lunch – Day One	
<input type="checkbox"/> \$10,000	\$5,000	Lunch – Day Two	
<input type="checkbox"/> \$9,000	\$4,500	Day One Reception – 2 Drinks plus Food	
<input type="checkbox"/> \$9,000	\$4,500	Day Two Reception – 2 Drinks plus Food	
<input type="checkbox"/> \$5,000	\$2,500	Flash Drive of Extended Abstracts	
<input type="checkbox"/> \$5,000	\$2,500	Technical Session Day 1	
<input type="checkbox"/> \$5,000	\$2,500	Technical Session Day 2	
<input type="checkbox"/> \$5,000	\$2,500	Breakfast Day One	
<input type="checkbox"/> \$5,000	\$2,500	Breakfast Day Two	
<input type="checkbox"/> \$5,000	\$2,500	AV Equipment and Services	
<input type="checkbox"/> \$5,000	\$2,500	AM & PM Break Food & Beverage Day One	
<input type="checkbox"/> \$5,000	\$2,500	AM & PM Break Food & Beverage Day Two	
<input type="checkbox"/> \$5,000	NA	Lanyards	
<input type="checkbox"/> \$2,500	\$1,250	Poster Gallery	
<input type="checkbox"/> \$5,000	NA	Delegate Bags	
<input type="checkbox"/> \$1,000	\$500	Speaker Gifts	
<input type="checkbox"/> \$2,000	NA	WIFI	
<input type="checkbox"/> \$1,000	\$500	Conference Signage	
<input type="checkbox"/> \$1,200	\$600	Printing Proceedings Catalogue	
<input type="checkbox"/> \$500	\$250	Note Pads, Pens	
<input type="checkbox"/> \$	\$	General Fund – You fill in the amount	
<b>Booth Space + Sponsorship TOTAL \$</b>			

Monday, November 18<sup>th</sup> | Norris Conference Center | Houston CityCentre

Join us for a workshop examining the evolution of the Conjugate Margins from the Equatorial Atlantic to Austral Magma-rich segment. Evaluate both margins as a single basin to understand similarities and differences between the proven and prospective petroleum systems of South America and West Africa. The workshop will focus on interpretation styles and 'hands on' data interpretation exercises to provide attendees with new ideas and insights in to exploration potential in the South Atlantic.

## AGENDA

<b>8:30-9:00 am</b>	<b>Registration &amp; Coffee</b>
9:00-9:30 am	Introduction and objectives   <i>(Brian Horn)</i>
9:30-10:00 am	Introduction to Magma rich margins – South of the Walvis ridge   <i>(Kyle Reuber)</i>
<b>10:00-10:15 am</b>	<b>Break</b>
10:15-11:15 am	<b>Exercise:</b> Namibia & Uruguay Conjugates
11:15-12:00 pm	The South Atlantic Salt basin   <i>(Jim Pindell)</i>
<b>12:00-1:30 pm</b>	<b>Break for Lunch</b>
1:30-2:30 pm	<b>Exercise:</b> Salt Basin Conjugate Sections (SaoPaulo – Namibe, Campos-Kwanza, Sergipe-S Gabon)
2:30-3:00 pm	Salt Basin Wrap up
3:00-3:30 pm	The Equatorial Atlantic Transform Margin   <i>(Neil Hurst)</i>
3:30-4:30 pm	<b>Exercise:</b> Equatorial Transform Margin (Ghana to N Brazil)
4:30 pm	Wrap Up - Happu hour

## COURSE INSTRUCTORS



### **Kyle Reuber, PhD.**

Kyle Reuber, PhD. is a geologist for ION's E&P Advisors Team based in Houston. His primary area of focus is Latin America and the Caribbean. His current role is multi-faceted and broad in scope. Kyle has designed SPAN programs in locations such as Panama, Argentina, and West Africa. His interpretation projects integrate the regional 2D -SPAN and available reprocessed vintage datasets.

Kyle's project management background also assists in his roles as the lead interpreter for multiple basin modeling studies along the Atlantic margins using the ION data.

Kyle's more recent works includes a tectonic analysis of the conjugate margins of the volcanic passive margins of Uruguay and Namibia. This project characterized the along-strike variability of seaward dipping reflector distribution and rifted basement architecture using the SPAN data.

He regularly presents his findings at industry conferences and was most recently recognized for his role as a co-author with the 2017 AAPG Jules Braunstein – Best Paper Award of 2017.

## COURSE INSTRUCTORS



### Dr. James (Jim) Pindell

Dr. James (Jim) Pindell has been Director of Tectonic Analysis Inc. (USA) and Ltd. (UK) since 1986 and 1998, respectively. Jim has also maintained a strong foothold in academia, with positions in the role of research scientist over various times at Lamont Earth Observatory, Dartmouth College, Rice University, the University of Houston, and Cardiff University (Wales).

Pindell has a PhD in geology from the University of Durham, England (1985, supervisors John F. Dewey and Walter C. Pitman); a Master's Degree in geology from SUNY Albany (1981), and a BA in geology from Colgate University (1979). Jim serves as a teacher and as a consultant to the oil industry, and in his academic role has published a broad range of some 75 papers on the Gulf of Mexico, Latin America, and the Atlantic margins.

Pindell synthesizes regional onshore and offshore, geological and geophysical, structural and sedimentological data to derive detailed tectonic and basin histories, and to establish petroleum systems within sedimentary basins and continental margins. He specialises in defining the relationship between tectonic history/processes and stratigraphic response, and in palinspastic reconstruction of paleogeographic evolution. The syntheses provide the foundations for larger team programs, providing the backdrop for assessing a range of exploration elements such as models of source and reservoir rock deposition, causes and timing of hydrocarbon generation, identification of paleo-migration pathways, thermal basin modelling, and play generation. Since 2011, Jim has assessed the deeper levels of regional seismic data sets for ION Geophysical (ION Consulting) to unravel processes of rifting and passive margin development. One result of this work was to receive the 2015 Best Paper award (for 2014) in Basin Research from the EAGE (Europe).



### Lisa Fullarton

Lisa Fullarton has 20 years industry experience gained predominantly in International oil companies including Hess, Shell and Texaco, working on mega-regional to prospect scale exploration projects across 5 continents. She has a PhD in Structural Geology from Royal Holloway and Bedford New College, University of London, a MSc in Petroleum Geology from the University of Aberdeen and a BSc in Geology from Imperial College, University of London. Since 2013 Lisa has been working as an Independent Consultant. She has been consulting with Ion Geophysical since 2017 on projects in Libya, Nigeria and West Africa.



### Neil Hurst

Neil is an exploration geoscientist in the E&P Advisors team at ION. Neil has 13 years oil and gas industry experience working at Statoil, BG Group and ION. Neil has a broad knowledge of multiple basins globally with experience working in specialist structural geology, global new ventures and asset teams within oil and gas operators.

Neil is skilled in seismic interpretation, structural restoration, regional and prospect scale evaluations, gravity modelling, basin analysis and fault seal analysis. Neil was previously subject matter expert (SME) for structural restoration in BG Group. Neil has a PhD and MEng from Liverpool University in Geophysics and Geology.



Save the date!

**GSH – HGS  
JOINT SOCIETY DINNER**

Plates to Prospects: Integration of data at multiple scales to enhance exploration, with insights from the deepwater fold and thrust belts offshore Northeastern México

Dr. Carl Watkins  
CGG GeoSolutions

OCTOBER 7<sup>TH</sup>, 2019  
NORRIS CONFERENCE CENTERS  
HOUSTON/CITYCENTRE



Monday, October 7, 2019

Norris Conference Centers • 816 Town and Country Blvd #210  
Social Hour 5:30–6:30 p.m.  
Dinner 6:30–7:30 p.m.

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

**To guarantee a seat, pre-register on the GSH website & pre-pay by credit card.**

**Pre-registration without payment will not be accepted.**

**Walk-ups may pay at the door if extra seats are available.**

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

# HGS & GSH Joint General Dinner Meeting

Carl Watkins

CGG GeoSolutions

HGS & GSH Joint General Dinner Meeting

## Joint Dinner with GSH

# Plates to Prospects: Integration of Data at Multiple Scales to Enhance Exploration, with Insights from the Deepwater Fold and Thrust Belts Offshore Northeastern Mexico

As deep-water exploration continues to gradually emerge from a relative lull in activity, the challenges to success remain as complex as ever. In the new reality of more limited exploration budgets and increased scrutiny, there is a greater requirement to extract maximum value from all available data spanning multiple disciplines and scales. Truly integrated approaches to exploration workflows represent one way of addressing this problem.

The recent relaxation and opening of Mexico to international exploration represents both challenge and opportunity. The challenges to deep-water exploration stem from a wide variety of technical, economic and political risks. The opportunities are clearly large, with an enormous exploration footprint and large structures in an area with a proven and prolific petroleum system. Significant advances in imaging below salt and shale have been a critical step that, when linked to the adoption of an integrated geoscience approach, have allowed us to address these problems. In addition to the geophysical challenges surrounding salt, shale provides an additional challenge. Deformation is extremely complex in the deep waters often displaying disharmonic shortening across stacked detachment levels of salt and shale. As we look to understand the continuity of prolific play fairways such as the Wilcox, Frio and Vicksburg, understanding the origin, timing and distribution of the deep-water fold-belts is essential.

Deep-water fold-belts are inherently related to base of the paleoslope and/or bathymetry of the detachment surface. Using the latest seismic data, calibrated to the regional stratigraphic framework, these fold-belts have been mapped, allowing their timing and distribution to be known. Further interpretation and integration with potential field data show their origin to be closely related to the underlying rift structure. The adoption of this fully integrated approach has helped to illuminate their origin, timing and evolution. The results have direct implications for source rock development, preservation and maturity as well as all other elements of the petroleum system including reservoir.

Deep-water exploration in Mexico targets Tertiary siliciclastic deposits from a variety of hinterland sources around the periphery of the Gulf of Mexico. With only limited well penetrations in the

offshore and much of the play fairway below salt, the wider geologic context becomes important for de-risking plays. Consideration of the entire depositional system is therefore important when de-risking reservoir presence and quality for exploration. An integrated approach to stratigraphic architecture, detailed depositional process evaluation and regional mapping all play an important role. The seismic data are invaluable in extending detailed reservoir and play level understanding away from the limited well control. This has enabled us to address the large scale depositional polarities that help to answer fundamental questions related to regional exploration potential in frontier parts of deep-water Mexico and also to propose some new ones. ■

### Biographical Sketch

**CARL WATKINS** graduated with a degree in Geology and Geography and did his PhD at Oxford Polytechnic working on the sedimentology, palaeogeomorphology and basin fill of the North Pyrenean Basin in SW France. He joined Robertson in 1991 and worked as a sedimentologist and reservoir geologist on projects ranging from frontier exploration in far eastern Russia to detailed reservoir characterization and modeling studies in Norway, North Africa, SE Asia, and the Americas. After managing several large integrated studies, including a 2007 study of the Russian and Norwegian Barents Sea, and developing novel techniques in drainage network and hinterland analysis, he joined the senior management team of Robertson in 2011, then part of Fugro.



Following the acquisition of Fugro's geoscience arm by CGG in 2013 Carl took an expanded role covering business development and marketing for CGG's GeoConsulting group, whilst finding ways to keep his technical expertise sharp. Carl currently works for CGG's MultiClient and New Ventures with responsibility for business development within the GeoSolutions Group. His focus is on identifying and realizing incremental value by combining leading geoscience expertise with CGG's extensive seismic library to address clients sub-surface problems.

# 19<sup>th</sup> ANNUAL GSH SALTWATER FISHING TOURNAMENT

Friday, October 11, 2019  
TopWater Grill Marina | 815 Avenue O, San Leon, TX

Bring your family and friends to help GSH fund growth, further education, student memberships and STEM educational outreach!

## Cash Fish Pots and Captains Meeting!

Cash/Trophies will be awarded for the heaviest Redfish (Non-Tagged), Speckled Trout, Flounder, Redfish Spot Pot and Stringer\*  
*\*(max of 1 Redfish, 3 Speckled Trout, and 1 Flounder)*

### EARLY REGISTRATION OPTIONS

*(prior to Sept. 27<sup>th</sup>)*

Individual . . . . .	\$75
Individual on Guided Boat/full day . . . . .	\$350
Non-fisher . . . . .	\$25

*Registration also covers:*

Launch Fee, Meal, Refreshments, Trophies, and **DOOR PRIZES!**

**REGISTRATION OPTIONS OFFER LIMITED SPACES ON PROFESSIONALLY GUIDED BOATS**

**PLEASE REGISTER AND VIEW ALL RULES ONLINE AT: <http://www.gshtx.org>**

Upon Registration, each participant will be provided by e-mail with a copy of the specific tournament itinerary, rules and disclaimer.

Wednesday, October 9, 2019

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

# HGS Environmental & Engineering Dinner Meeting

*Rene Truan*  
Texas Board of  
Professional Geologists

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

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

**Pre-registration without payment will not be accepted.**

**Walk-ups may pay at the door if extra seats are available.**

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

## Update on the TBPG from the Executive Director

For Professional Geoscientists in Texas, the past year has been a trying time. From the recommendation for the abolishment of the P.G. license and the Texas Board of Professional Geoscientists by the Sunset Commission staff to the positive recommendations from the Sunset Commission. As of September 1st, the TBPG has five years to prepare for another Sunset review. Again our future will hang in the balance.

Rene D. Truan became the new Executive Director of the TBPG on February 15, 2019. He will be our guest speaker at our October meeting. Come and hear from him as he provides an update on the TBPG since coming out of the recent legislative session. In addition, he will tell us “where we are headed” from the perspective as the TBPG Executive Director.

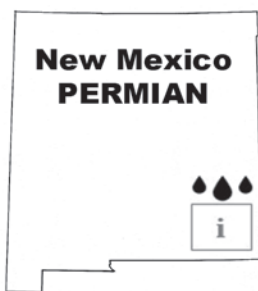
This would be a great time to come with questions and suggestions. In order for us to move forward as Licensed Professionals, we need to be informed and prepared to address the concerns of the Sunset Commission. ■

### Biographical Sketch

**RENE TRUAN** currently serves as the Executive Director of the Texas Board of Professional Geoscientists (TBPG). Mr. Truan has over 30 years’ experience in state government, 20 of those in Executive Leadership positions. The majority of his career was serving as Deputy Land Commissioner for the General Land Office and Veterans Land Board under 4 different Texas Land Commissioners. In this capacity, Mr. Truan was responsible for overseeing all surface and subsurface activities related to the leasing, sale, development and protection of state lands and minerals. Mr. Truan also served the Texas Inspector General for Health and Human Services as the Management Director responsible for implementing strategies to improve the process of investigating Fraud, Waste, and Abuse cases in Texas. Mr. Truan joined the Board of Geoscientists in March of this year and helped guide the agency and governing board through the 86th legislative session. Mr. Truan attended the University of Texas and Texas State University with degrees in Public Administration and Economics. He is also a graduate of the UT LBJ School’s Executive Development Program and the International Transformative Leadership Program. Mr. Truan has been married for 16 years and lives in Austin with his wife and two daughters.



HGS Environmental & Engineering Dinner Meeting



**GET A HEADSTART** on land and drilling activity in Southeast New Mexico

**NEW SUBSCRIPTION SERVICE** tracks spacing unit formation in New Mexico Oil Conservation Division hearings

**For more information:**



**nmoginfo.com**

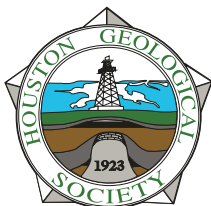
Marilyn Gruebel, Owner/Consultant  
mgruebel@nmoginfo.com



Earth Science Activities for the  
Whole Family Coming in October!

## Earth Science Week, 2019

October 12 – 20



HGS in partnership with the American Geosciences Institute (AGI) is pleased to announce the theme of Earth Science Week 2019

## Geoscience is for Everyone

This year's event emphasizes the importance of the geosciences in the everyday lives of all people.

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

**Saturday, October 12 (11:00 am – 3:00 pm)**

### **Earth Science Celebration at the Houston Museum of Natural Science**

This year's event will feature hands-on geoscience activities and interactive science demonstrations in the Glassell Hall, Morian Paleontology Hall Lobby and Wiess Energy Hall.

In the Wiess Energy Hall, museum volunteers will be stationed in the areas of their expertise to offer further insight into the science and technology of the displays. Our popular passport program will guide students through the activities located in the halls.

*Teachers: 2019 ESW Toolkits free with valid school ID*

**Saturday, October 20 (arrive between 11:00 am – 3:00 pm)**

### **Houston Geological Society Fieldtrip: High Island, TX**

Oil and fossils on the beach. Arrive between 11 and 3 pm.  
Meet where HWY 124 runs into the ocean. No gas and only one food stop.  
About 90 miles from Houston.

For more information, see the HGS Earth Science Week webpage  
<https://www.hgs.org/earth-science-outreach>

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

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

**Pre-registration without payment will not be accepted.**

**Walk-ups may pay at the door if extra seats are available.**

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

**Bill Fairhurst**

*Riverford Exploration, LLC and*

*Bureau of Economic Geology, Jackson*

*School of Geosciences, University of Texas*

*at Austin.*

## The Perfect Unconventional Resource Portfolio

Having all industry knowledge and experiences to date in U.S. unconventional resource plays and traveling back to time zero (T0 = prior to drilling, completing and producing from the first unconventional resource horizontal well, onshore United States); what investment choices should one make, which unconventional resources plays should be selected and which should be avoided? Given industry knowledge and experiences how can we construct The Perfect Unconventional Resource Portfolio if the unconventional resource revelation started today with today's product prices and costs?

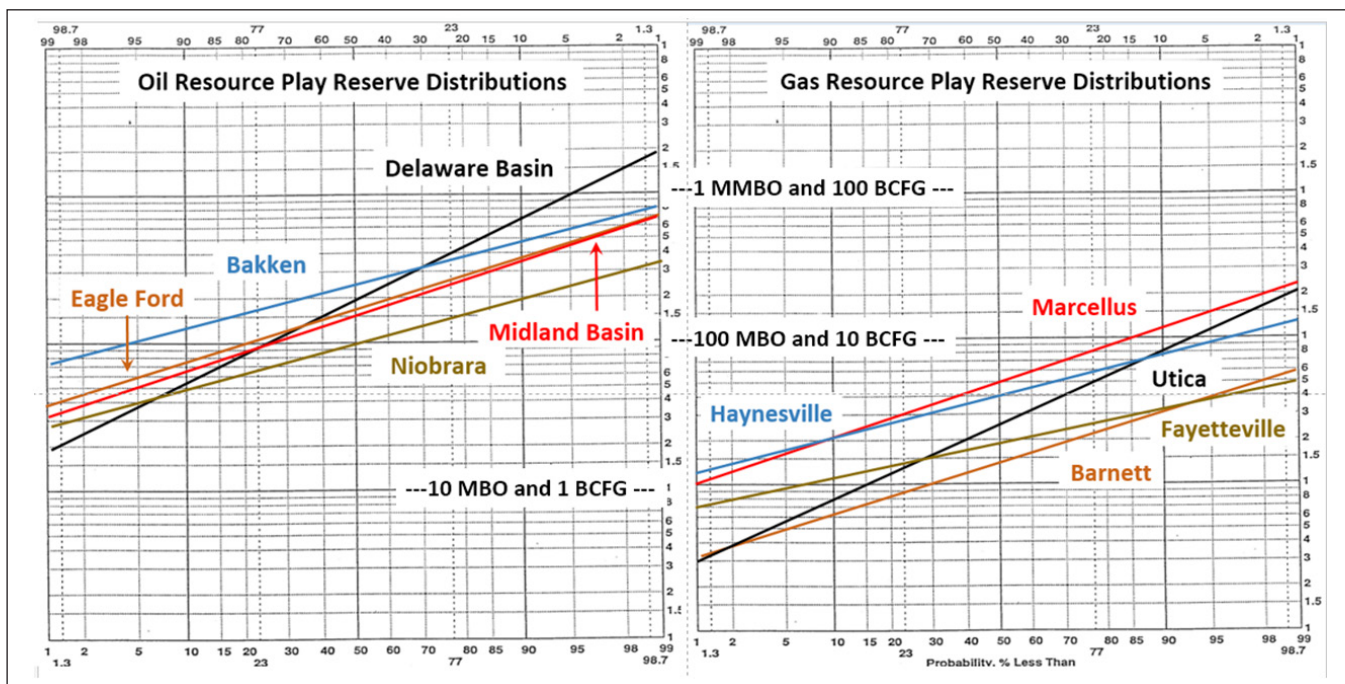
### Construction of the Portfolio Model

Most economic optimization models, developed for oil & gas industry project selection during the 1970s – 1990s, focused on the optimum level or percentage to acquire for each project. Alternatively, Portfolio Optimization modeling determines the percentage of a firm's total CapEx that should be invested in each project or similar class of multiple projects.

Using the Tight Oil Resource Assessment Industrial Consortia (TORA) research at the Bureau of Economic Geology, Jackson School of Geosciences, University of Texas – Austin, previous Bureau Sloan Foundation and DOE funded research evaluations (now part of the TORA Consortium), as well as some additional play information, Estimated Ultimate Recoveries (EURs) for every unconventional resource well in ten resource plays are plotted by play in **Figure 1** as log-probability distributions for five gas resource plays (Barnett, Fayetteville, Haynesville-Bossier, Marcellus, and Utica) and five oil resource plays (Bakken, Eagle Ford, Midland, Delaware, and Niobrara).

Since Markowitz's 1990 Nobel Prize-winning work on portfolio construction for equities (Markowitz, 1952 and 1957) and most significantly since the late 1990s, sophisticated financial software and Monte Carlo simulations have been developed to accomplish portfolio construction for investment choices. Previous experience

HGS General Luncheon continued on page 37



**Figure 1:** Log : Probability plots of primary products, oil and gas recoveries per well for 10 unconventional oil and unconventional gas resource plays used in this study.



# 2019 Inaugural GSH FALL FORUM

## The Business of UNCONVENTIONALS and the Role for Geophysics

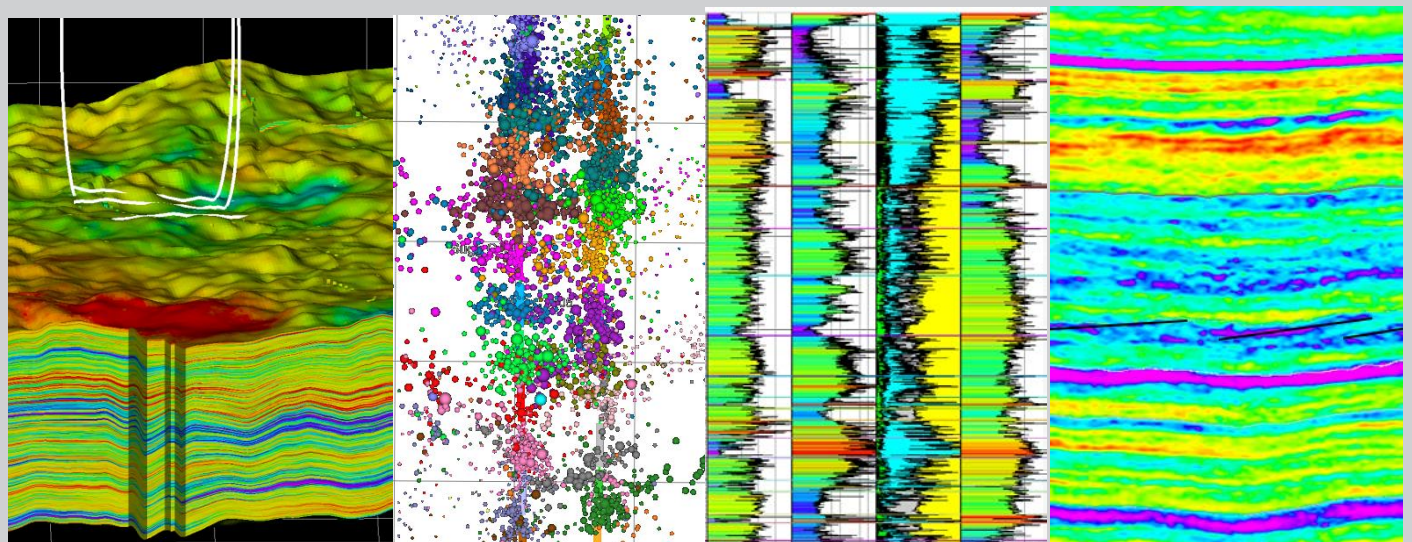
November 1, 2019

Norris Conference Center, Houston, TX

Exploring How Geophysics Is Used In Unconventional Resource Plays

- The business of unconvensionals (how to survive/be successful/competitive)
- How is investor pressure for free cash flow affecting the market?
- How do we demonstrate the value of geophysics in unconventional plays?
- What Earth Science technical disciplines are relevant in unconvensionals?
- How should universities and YPs prepare for the future in this field?

Includes a panel discussion by some of the leaders in the industry



For Registration, Sponsorship & Booth info, call the GSH @ 281-741-1624 or visit [gshtx.org](http://gshtx.org)

evaluating thousands of individual investment options in hundreds of models has shown a statistically significant confidence and correlation with these financial evaluation packages using paper, pencil, and straight-edge methodologies verses more sophisticated, expensive Monte Carlo simulations, and can achieve a similar sophistication of a solution and are used in this report.

Given that play EURs are log-normally distributed, the Expected Value (EV), mean, of a log-normal distribution can be determined graphically without having to compute the EV from each value (individual well) in a distribution. Plotting the known p90, p50, and p10 reserves on log-probability paper and drawing a straight line provides an accurate representation of the reserve distribution for each play.

The EV of a log normal distribution is determined using the p10/p50 ratio. In this study, p90 represents the lower 10% of values and p10 represents the higher 10%. Using the p10/p50 ratio and graphs the EV is defined along the Cumulative Probability distribution (Rose et. al, 1994). Knowing the EV cumulative probability percentage on the x-axis of the log-probability graph and intersecting point with the reserve distribution the EV EUR for each unconventional resource play is defined. The EV is verified using Swanson's Mean  $((p90 \cdot .3) + (p50 \cdot .4) + (p10 \cdot .3))$  (Capen, 1992).

Economic models only need to be run for three EUR values (p50, EV, p10) to represent the entire distribution of potential economic outcomes. The EV economic model is used as the measure of Central Tendency, most likely outcome for investors. Companies or investors having fewer than 30 investment options should make financial decisions on p50 economic results, the most likely outcome of small samples. In constructing The Perfect Unconventional Resource Portfolio in this study sample sizes for each investment option are greater than 30 and the mean, EV, figures are used.

An optimal portfolio is constructed on a single economic metric. Several economic/financial metrics are typically reported in the output of economic runs for investment options and may be used as screening criteria. The Perfect Unconventional Resource Portfolio model developed here uses Investment Efficiency (IE), Discounted Return on Investment (D(ROI)) also referred to as the Profitability Index (PI). Either term may be used interchangeably.

Economic runs were made using current product prices, CapEx, LOE for each p50, EV, p10 EURs for each play. Product prices and costs were escalated at 3%. Depending on actual production and EUR five products were included: oil, condensate, plant tail-gate gas volumes for liquid-rich gas or well-head gas volumes for drier-gas wells, natural gas liquids (NGLs), and water.

A first comparison of investment options is ranked from highest IE to lowest (**Figure 2**). Using that comparison only, CapEx would be deployed in descending order after investment options are exhausted for the preceding investment.

Two observations on investment efficiency and profitability index models are worthy of note. First, a general guideline is that IE should be greater than two (2) and undiscounted ROI (Cash-on-Cash) should be greater than three (3). The fact that none of the EV investment options in this model has an  $IE \geq 2$  nor undiscounted  $ROI \geq 3$  at current product prices, investments in any of these options would be considered only if no other better investment options were available.

As the industry is experiencing, the high CapEx exposure of these plays is one of the most significant financial issues with unconventional resource plays. These investments are so capital intensive per the reserves recovered and economic returns that the EV reserves of each unconventional resource play might not

HGS General Luncheon *continued on page 39*

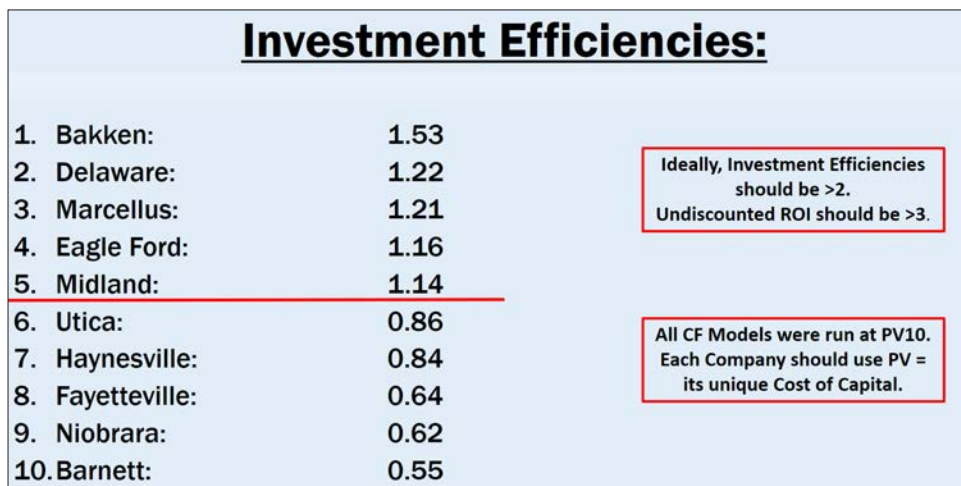


Figure 2: Ten unconventional resource plays ranked by investment efficiencies (profitability index).



# 2019 GSH Tennis Tournament



**Friday November 8, 2019**

12-1pm: Registration & Lunch

1-5pm: Tennis Tournament

## **Copperfield Racquet and Health Club**

Chair: [rjones@seitel.com](mailto:rjones@seitel.com)

GSH: [kathys@gshtx.org](mailto:kathys@gshtx.org)



be good investment. The fact that the industry has spent so much capital on these plays without impressive returns may be destroying wealth. This is an increasing concern over the last several years and reason additional investment funding has been difficult to obtain for unconventional resource E&P firms.

Second, discounted CF models in the upstream oil & gas industry are almost universally discounted at 10% or PV10. Argument for using a standard discount rate is that it is a standard way to compare different investment options regardless of a company's capital structure. PV10 is used because that is the expected market return for equities. Using an industry standard PV is financially incorrect. The correct PV is each firm's or investor's Cost of Capital (COC). This is because the investment option being evaluated is compared to the cost or benefit of keeping money where it is or investing in other financial options for each firm.

If a firm is 100% financed by public equity and public equity expects a 10% return, then all individual investments should be discounted at PV10. If a firm is selecting oil & gas investment opportunities from cash being held in a saving account, that firm discount rate should be 1 - 2.5%. Their alternative is to keep the funds at the bank or make the oil & gas investment. If that firm used a PV10 CF model, they would under bid or under select the oil & gas investment opportunities.

Similarly, firms using Mezzanine or Private Equity (PE) should use an 8 - 18% discount factor, which is their cost of capital. The risk that firms with higher than 10% expected return create using a PV10 is overestimating the value of opportunities relative to their COC. If they make an investment choice at or close to PV10 and their actual COC is closer to 14.5%, they may never meet the requirements or obligations for investors. Most evaluations in the oil & gas industry are likely making these errors in some way.

Another common oil & gas industry error is to increase PV discounting to account for technical risk or increased reserve category (e.g. PUD vs PDP). Technical risk should be evaluated in the CF portion of the model not by discounting. When risked twice (once technically and again using a higher discount factor than COC) higher-risk, further-out, or less developed reserve category projects are not evaluated equally to properly discounted evaluations. So, let's visit risk.

**Risk.**

Three risk factors are reviewed: technical risk, individual investment option (project) risk and portfolio risk. Economic risk (product price and costs) may also be considered at these stages and are usually run as sensitivity cases. The proper way to do this in constructing a Portfolio is to use similar economic factors and construct Portfolios for each sensitivity case. All risk factors need

to be separated and treated properly.

**Technical Risk.** Technical Risk is the risk or variability of various production outcomes and factors effecting these potential outcomes (geologic/reservoir characterization). A quick-look measure of the unconventional resource plays risk (variability) is the slope of the potential production outcomes on the log-probability chart (**Figure 1**). Most of the gas and oil plays have similar slopes or similar technical risk of various production outcomes. The uniform slopes in four of the five plays for each oil and gas is somewhat surprising. Oil and gas each has one similarly higher technical risk option or risk of production outcomes. For oil that is the Delaware Basin and for gas it is the Utica play. Higher technical risk projects have higher variable outcome distributions so the EV is farther from the p50. The standard deviation can be derived from just two figures, p50 and p10.  $SD = ((p10-p50)/p50) / 1.28167$ . The denominator is the z value between p50 and p10 in a standard normal distribution.

**Project Risk.** Project Risk is the risk or variability of financial outcomes of a single project or investment option. It may or may not be similar to technical risk but must be evaluated separately. The standard deviation of the project risk can be calculated in the same method used for technical risk but on the appropriate project financial outcome metric being evaluated.

**Portfolio Risk.** Portfolio Risk is the risk or variability of selection among various investment options (projects). This is the magic of portfolio construction and selection. The risk or standard deviation is the square root of the sum of the individual options weight percent squared times the standard deviation squared of that option.

$$Risk_{portfolio} = \sqrt{\sum_{i=1}^N (w_i Risk_{i,project})^2}$$

This creates a hyperbolic change in risk reduction among two or more investment choices. This non-linear, greater risk reduction is the reason two or more investment choices are less risky than individual investment choices or a straight average between investment options.

**Returns.**

Returns are the EV of the financial metric used for each investment option or the weighted average of more than one option, a straight-weighted average.

$$Return_{portfolio} = \sum_{i=1}^N f_i Return_{i,project}$$

**The Perfect Unconventional Resource Portfolio Defined**

The Perfect Unconventional Resource Portfolio includes all investment options and all combinations among those options (Figure 3). An envelope is defined as the maximum and minimum return for each level of risk or maximum and minimum risk for each level of return. There are a limitless number of selections within the envelop.

The Efficient Frontier, Efficient Set, “consists of those portfolios that offer the highest return for each and every level of risk, or the lowest risk for each and every level of return” (Jacob and Pettit, 1988). The efficient set is from the Minimum Standard Deviation Portfolio (MSDP) point along the envelop with the highest return at any given level of risk.

A straight line can be drawn from the y-axis. This point is the risk-free investment opportunity, usually T-Bills. This model has been modified using investment efficiency so an IE of 1.0 was used as the firms cost of capital or required minimum return for a public company. The intersection or tangent of that line and the efficient set, is the Perfect Unconventional Resource Portfolio.

At time zero (To), with all research, information, and results known to date at today’s product prices and costs; the perfect portfolio is the following percentages regardless of company size or aversions to risk (technical, project, or portfolio risk):

- 45% Bakken,
- 29% Midland Basin,
- 9% Delaware Basin,
- 8% Eagle Ford, and
- 8% Marcellus.

The solution assumes independence among investments, team or company area expertise, efficient markets for prices, transportation, and all investors COC is 10%.

There are alternatives to increase return or decrease risk. That is not to move up or down the efficient set but to move along the risk-free borrowing line. Increased return with least amount of increased risk would be to borrow to invest more in p\*, the portfolio percentages presented. To decrease risk and maximize return, the investor would invest in p\* but not the entire CapEx and lend at 10% to others.

The Bakken was first in both the ranking of investment efficiency and the percentage of CapEx in the budget defined by The

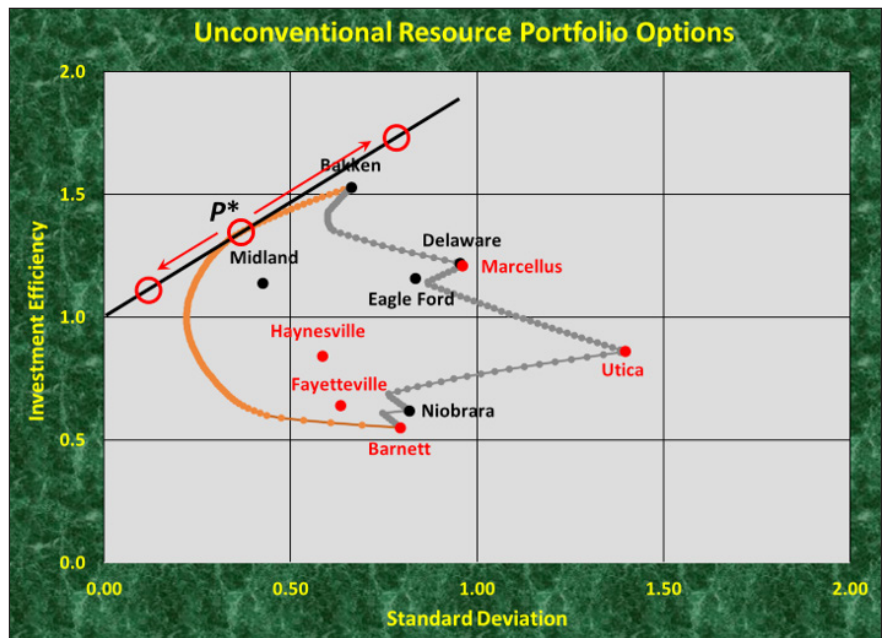
Perfect Unconventional Resource Portfolio. The Midland Basin unconventional resource play moved from fifth in the ranking of investment efficiency to second highest percentage (29%) of CapEx in the Portfolio. The Delaware Basin moved from second to third. Why? The Delaware EV Investment Efficiency is 8% higher than the Midland Basin but the lower variability (risk) of the investment efficiency makes the Midland Basin a better risk : return option in the portfolio. Similar but to a smaller drop in order also occurs for the Marcellus because of the higher variability of outcomes.

**Macro-financial to Micro-financial**

Individual firm (microeconomic scale) solutions will fall within the industry (macroeconomic) scale. The current reserve estimation includes: actual results, current and applied technologies, economic, and financial advancements at the time each well was drilled. However, an individual firm may have reason to use a different distribution of outcomes verses the industry outcomes (timing, technology, opportunity differences).

Four such cases are shown (Figure 4): an original Elm Coulee distribution (shown but not used in constructing the portfolio), Elm Coulee in-fill well expectations, using current technology to drill and complete 1-mile long Delaware horizontal wells, and current technology to drill and complete 2-mile long Delaware horizontal wells. The new p90 to p10 distributions fall within the original distributions but generally above the play-wide p50 values.

The new Perfect Portfolio is shown with previously constructed portfolio in Figure 4.



**Figure 3:** Unconventional resource portfolio options, portfolio envelop defining all possible investment outcomes, MSDP = Minimum Standard Deviation Portfolio, risk-free line, the perfect portfolio (p\*), and borrowing and lending options.

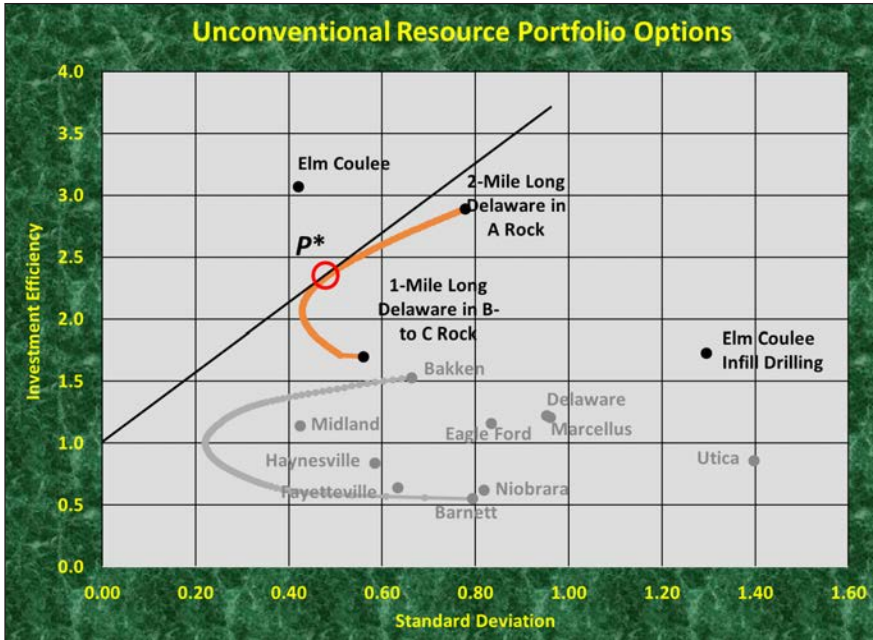


Figure 4: The Perfect Portfolio for three new investment options.

	Investment Efficiency	Undiscounted ROI
Elm Coulee Original wells	3.07	4.58
Delaware Basin new 2-Mile Horizontal wells	2.89	4.01
Elm Coulee new in-fill wells	1.73	2.73
Delaware Basin new 1-Mile Horizontal wells	1.70	2.59

The Perfect Unconventional Resource Portfolio for XEx given these new investment options are:

All Choices Available (excluding original Elm Coulee):	3-New Choices Only:
36% 2-Mile Delaware Horizontals	54% 2-Mile Delaware Horizontals
26% 1-Mile Delaware Horizontals	38% 1-Mile Delaware Horizontals
14% Bakken	8% Elm Coulee Infill
10% Midland	
5% Elm Coulee Infill	
3% Eagle Ford	
3% Delaware	
3% Marcellus	

Several of these options are above the hurdle of 2.0 for investment efficiency and 3.0 for undiscounted ROI or closer to these metrics than the previous options.

These are possible and were investment opportunities available to an individual firm, Company X. Company X's decisions (investment selections and percentages of total CapEx, Portfolio) and performance can be evaluated using these analyses.

Given the small size of the firm, it is unlikely that Company X could place itself in a position to invest in each of the investment choices defined by All Choices Available. However, Company X came close to combining the two portfolios defined.

What investment decisions did Company X make or what could others firms do to capitalize on the newly defined and existing resource play opportunities (Figure 5)?

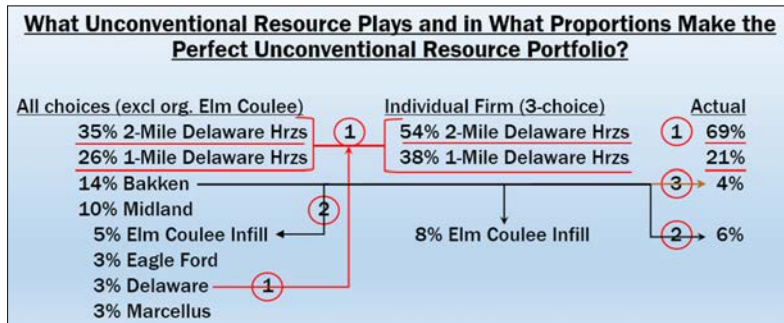
1. Existing positions in the Delaware Basin allowed for participation in drilling new 2-mile and 1-mile horizontal wells in the Delaware Basin.
2. An existing PDP position in the Elm Coulee Field allowed for participation in the Elm Coulee in-fill drilling.
3. Additional Bakken PDP was acquired for less risk than drilling and completing new Bakken wells.

Performance Comparison to The Perfect Unconventional Resource Portfolio:

1. All Delaware new 2-mile (69% of CapEx) and 1-mile horizontal wells (21% of CapEx) production and economic returns came in as modeled representing 90% of Company X's CapEx. The Perfect Portfolio with all 14 investment options indicated a mix of 61% of CapEx. The model using the 3-new options only was 92% of CapEx for this investment option.
2. All Elm Coulee in-fill drilling EURs came in the top one-half of originally estimated production profile, representing 6% of Company X's CapEx including acquisition costs compared to 5% and 8% of the two Perfect Portfolio models. Having more positive results than modeled may be from limited sample size or shift in the lower portion of the projected reserve distribution similar to the original Elm Coulee EUR distribution. More research or in-fill production results are needed to determine which of those factors most likely resulted in better than expected outcomes.
3. The Company purchased additional Bakken PDP positions using 4% of CapEx.

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# HGS General Luncheon continued from page 41



**Figure 5:** Company X's 2018 – 2019 use of The Perfect Portfolio using a combination of the known existing unconventional resource EUR distributions with the three new investment options. #1: Existing positions in the Delaware Basin allowed for participation in drilling new 2-Mile and 1-Mile horizontal wells in the Delaware Basin. #2: An existing PDP position in the Elm Coulee Field allowed for participation in the Elm Coulee in-fill drilling. #3: Additional Bakken PDP was acquired for less risk than drilling and completing new Bakken wells.

Are better than expected outcomes good? The first answer is obvious; they are good financially because of the superior results. They are not good solution for the technical and financial team that built the models. Why? If management and investors had better pre-drill estimates and known of the better than expected returns, the Portfolio selection and investment choices would likely have been more heavily weighted and more of these better returns would have been selected.

Company X came very close to matching The Perfect Unconventional Resource Portfolio investment choices and percentages. The outcome was slightly better than the predicted investment options due to better than expected results of the Elm Coulee in-fill well program. The Delaware Basin investments results were exactly what the technical and financial team had predicted. These observations assist in identifying technical and financial evaluations that need improvement and those that should be rewarded as most accurate in developing The Perfect

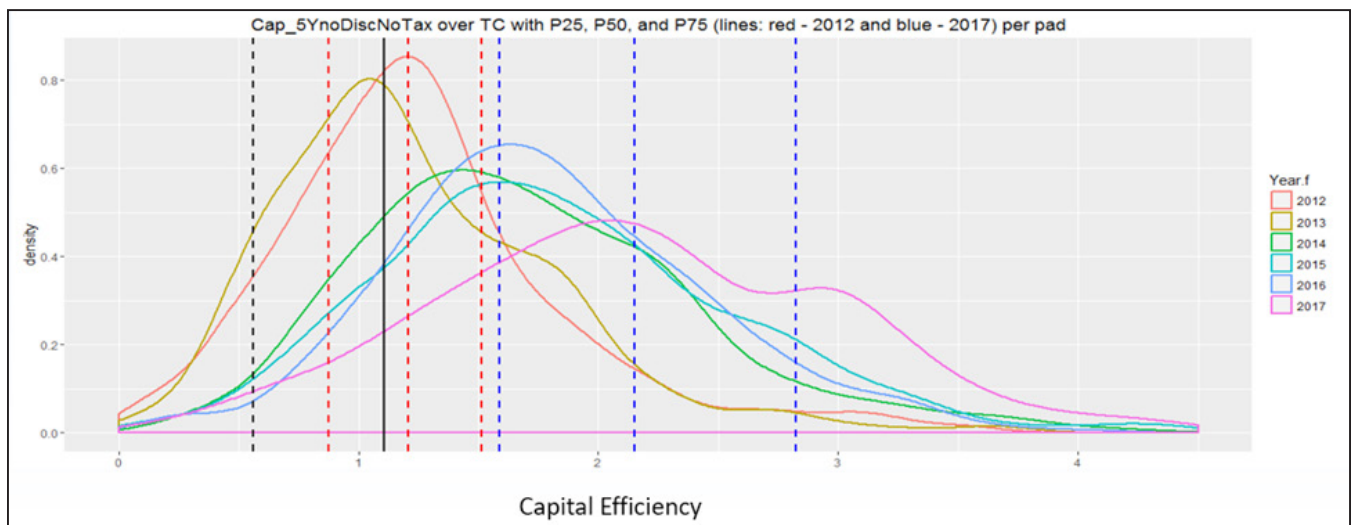
Unconventional Resource Portfolio. The focus of the firm on investment efficiency and its investment selection has assisted in the firm obtaining a Return on Capital Employed (ROCE) of over 80% for sixteen years and 71.75% since January 2017.

More good news! **Figure 6** (Ikonnikova et. al., 2018) shows an increase in the distribution of investment efficiencies for all Midland Basin Wolfcamp A & B wells by year (2012-2017). The distribution has a mode and averages just over one (1) during 2012-2013; increasing to one and half (1.5) during 2014-2016; and over two (2) in 2017. The increase in investment efficiencies is likely attributed to the higher production rates at lower marginal cost as the result of increased horizontal distance in zone per well;

tighter stage, cluster, and perforation spacing; higher proppant and fracture stimulation concentrations per linear foot; and the change to slick water proppant fluids. Such improvements have also been observed in other unconventional resource reservoir plays.

**Conclusions:**

1. This paper has demonstrated construction of Perfect Unconventional Resource Portfolio, the optimum drilling, completions, production, and economic results by basin/play/project investment choices in time zero (T0) using today's information and knowledge of all drilling, completion, and production results.
2. The Perfect Unconventional Resource Portfolio for all resource plays (Macroeconomic Model) can be modified and used by individual firms (Microeconomic Model) to make better investment choices and beat the Macroeconomic, the industry model.
3. Increases in investment efficiencies by year have been improving. ■



**Figure 6:** Capital efficiencies distribution of Midland Basin Wolfcamp A & B wells by Year (2012-2017).

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**Biographical Sketch****BILL FAIRHURST**

President, Riverford Exploration, LLC  
 Manager, Industry Engagement  
 Bureau of Economic Geology  
 Jackson School of Geosciences  
 The University of Texas – Austin



Riverford Exploration, LLC is a privately held Exploration, Production and Consulting business with interest in over 12,000 gross HBP acres and 70 wells producing 10,000 BOE per day in Montana, North Dakota, Oklahoma, north Texas, and the Delaware Basin.

As Manager, Industry Engagement for the Bureau of Economic Geology, Bill serves as a contact for Bureau research consortia and operating Oil & Gas Exploration & Production companies.

Bill has been involved in the majority of U.S. resource plays prior to the resource revolution and is credited with economic discovery of the WolfBone play in the Delaware Basin. Previously, he placed his company in Elm Coulee Bakken Field prior to its discovery, the largest onshore U.S. discovery in 56 years. He and his teams have also discovered dozens of new fields in traditional plays in the Williston, Rocky Mountains, Permian, mid-Continent, Gulf Coast Mesozoic basins, offshore U.S. and has worked and lead exploration programs on six (6) continents with the former President of Shell, Arco and other E&P firms.

Bill recently turned around a mid-size, private equity (PE) financed Exploration & Production (E&P) firm from a \$70 million loss to a \$600 million dollar gain in two years. Previously he was a key Executive and Technical leader at well-known, private E&P firm driving growth, strategically advancing a \$200 million firm into a billion dollar organization in six years, adding two new regional offices and hundreds of new investment opportunities. He has successfully led A&D teams in technical and general management positions and assisted with equity and debt financing for several organizations.

Bill graduated from Ohio Wesleyan University in Geology and Economics-Management; the University of Missouri-Columbia with Master in Geology; and from the C.T. Bauer College of Business at the University of Houston with Master of Business Administration in Finance. He has provided Expert Legal testimony involving geology, engineering and economic evaluation; provided and managed professional testimony before eight state Industrial Commissions; published and spoken nationally and internationally in technical, business and policy forums. Bill is a Certified Petroleum Geologist by the AAPG; a licensed Professional Geologist in the state of Texas; a Qualified Reserve Evaluator by the Canadian Securities Administrators, and member of Houston Geological Society.

Monday, October 28, 2019

Norris Conference Centers • 816 Town and Country Blvd #210  
Social Hour 5:30–6:30 p.m.  
Dinner 6:30–7:30 p.m.

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

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

**Pre-registration without payment will not be accepted.**

**Walk-ups may pay at the door if extra seats are available.**

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

### Abstract 1

## Stratigraphic Controls on the Connectivity and Flow Performance of Deep-water Lobe-dominated Reservoirs

**Fabien J. Laugier and Morgan D. Sullivan**

*Chevron Energy Technology Company Clastic Stratigraphy Team*

**Michael Pyrcz**

*Department of Petroleum Engineering,*

*The University of Texas, Austin*

**Laura Murray**

*Chevron Gulf of Mexico Appraisal*

Sand-prone deepwater lobes are conventionally modeled at reservoir scale as laterally extensive and homogeneous; however, recent work shows that in deep-water lobe systems stratigraphic architecture is spatially variable and complex, with facies and reservoir quality varying across multiple hierarchical orders (bed, element, complex, complex set). Here we consider the impact that these hierarchical variations have on reservoir connectivity and performance forecasts for high-net deep-water lobe reservoirs. We investigate the degree and style of heterogeneities observed in outcrop and subsurface systems, focusing on variability in: (1) distribution of facies and reservoir quality; (2) presence and nature of shale drapes; and (3) dimensions and stacking patterns.

We present results from >3000 process-mimicking (PM) reservoir models that capture realistic lobe geometries, stacking patterns, and internal heterogeneities. Using statistical analyses of flow simulation results we quantitatively identify the key stratigraphic features and hierarchies impacting reservoir connectivity, sweep efficiency, and flow performance, and critically, highlight the predictability of their impact in deep-water lobe reservoirs. Intra-element flow is limited by bed-to-element scale facies and amalgamation trends, while reservoir-scale flow is limited by spatial connectivity of amalgamated high-quality facies across element-to-

complex-set stacking patterns. Results indicate fine-scale features, those least captured via common geostatistical techniques, are a primary control on connectivity; element-scale spatial trends of NTG, facies amalgamation and reservoir quality can reduce sweep efficiency by 22% due to transitional compartmentalization, while accurate modeling of 3D shale-drape geometry rather than modeling flat permeability barriers, can reduce sweep efficiency 20%. In contrast to the conventional assumption that fine-scale heterogeneities have limited impact in high-net lobe reservoirs, we show that these heterogeneities compound over hierarchical orders to result in a non-linear decrease in connectivity; even a low proportion of shale drapes in certain element-scale stacking patterns can form composite, complex-wide barriers. We conclude that fine-scale heterogeneities need to be rigorously characterized and captured in reservoir models at their appropriate scales for robust well optimization and production forecasting in deep-water lobe reservoirs such as the those in the Paleogene Wilcox Formation. ■

### Abstract 2

## Stratigraphic Surface-based Modeling of Deep-water Reservoirs: Application to an Ultra-deep Gulf of Mexico Wilcox Asset

**Laura Murray**

*Chevron Gulf of Mexico Appraisal*

**Fabien J. Laugier and Jesse Thompson**

*Chevron Energy Technology Company Clastic Stratigraphy Team*

**Rhonika Kaplan**

*Chevron Energy Technology Company Reservoir Modeling Team*

Stratigraphic heterogeneity in clastic reservoirs is mainly driven by the process-evolution of depositional systems, the collective stratigraphy being the result of deposition and erosion over time. While deep-water reservoirs are often high-net, recent studies have indicated that fine-scale heterogeneities such as hierarchical

facies distributions, shale drapes, and high permeability streaks can impact reservoir performance predictions. Areas where seismic resolution can be low and well data are sparse, such as the Paleogene Wilcox reservoirs of the Gulf of Mexico (GoM), it is paramount to integrate subsurface data and outcrop analogs to appropriately characterize and model the reservoir heterogeneities that are crucial for constraining field development strategies and EUR forecasts. The issue of appropriately modeling multi-scale reservoir heterogeneity is addressed here using a process-mimicking (PM) approach to model the surface-based evolution of deep-water channels and fans and their associated multi-scale distribution of rock properties. The limitations of geostatistical approaches that require stationarity and volumetric importance of stratigraphic features are bypassed by representing heterogeneity through surface-based models. As a result, the models capture the fine-scale features that control connectivity.

These methods were applied at a Wilcox asset located in more than 4000 feet of water in northwest Keathley Canyon, GoM. The target intervals exhibit a shift from deposition in unconfined fans to weakly confined channels, to channel-levee environments, each with their own distinct and hierarchical heterogeneities (e.g., facies distribution, shale drapes). Well data were analyzed within depositional context and calibrated to well-studied deep-water outcrop analogs. Quantitative outcrop and subsurface inputs were used to constrain the PM models and ensure that the heterogeneity observed in the wells was appropriately modeled away from well control. Analysis of these models reveals robust representations of deep-water heterogeneities and highlights the importance of surface-based approaches for capturing reservoir heterogeneity and forecasting performance. ■

### Biographical Sketches

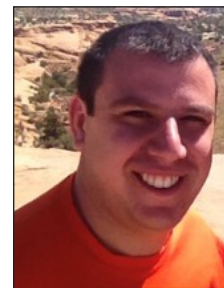
**Laura Murray** has over 21-years of experience with Chevron, specializing in reservoir characterization of development, appraisal and major capital projects. She graduated from the University of Wyoming with a MS in Geophysics and Western Washington University with a BS in Geology, specializing in Geological Engineering. She has worked a variety of depositional settings in different basins, characterizing many complex reservoir systems (brownfield, greenfield & exploration) both domestic onshore and offshore, as well as internationally. The last 15 years Laura has used her geologic knowledge and expertise



developing detailed reservoir characterizations and building static reservoir models in the Deepwater Gulf of Mexico and onshore Midcontinent Permian, Uinta and San Juan Basins. She has experience with clastic/aeolian, carbonate and mixed systems – both conventional and unconventional, in addition to primary, secondary and tertiary recovery expertise.

Her roles have included development, appraisal & operations geologist, appraisal geophysicist, earth science team lead, earth science advisor, static modeler, and her current role as Gulf of Mexico Appraisal Static Modeling Advisor. Laura is also the Founder of The Rescue for PTSD, a nonprofit organization that adopts rescue/shelter dogs and trains them to be service dogs for military Veterans suffering with PTSD.

**Fabien Laugier** has 5-years of experience with Chevron Energy Technology Company, specializing in Deepwater stratigraphy and reservoir modeling, and quantitative characterization of reservoir heterogeneity and connectivity across multiple asset types. He graduated from the Colorado School of Mines with a Ph.D. in Stratigraphy where he focused on shelf-edge to Deepwater deposits in the Karoo Basin of South Africa, and previously attained a BS in Geology and BA in Business/Economics from Wheaton College, Illinois.



As part of the Chevron ETC Clastic Stratigraphy team Fabien works primarily as a research scientist focused on predicting reservoir heterogeneity, connectivity, and performance for all clastic and unconventional assets. Additionally, he is a technical consultant on international and domestic projects ranging from deep-water to aeolian, and is the project manager for machine-assisted stratigraphic characterization R&D.

Prior to Chevron Fabien interned and consulted with multiple major and independent oil and gas companies, focusing on deep-water and unconventional exploration and reservoir characterization. He has a significant field stratigraphy background, having spent over 400 days in the field in 15 countries, and leverages this expertise for understanding the fine-scale heterogeneity that impacts performance, which is often missed by subsurface sampling.

# October 2019



Sunday

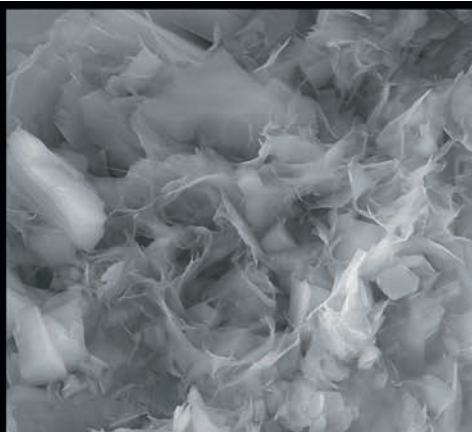
Monday

Tuesday

Wednesday

	<p><b>Members Pre-registered Prices:</b>                  Dinner Meetings members..... \$40                  Emeritus/Honorary members..... \$40                  Student members ..... \$10                  Nonmembers &amp; walk-ups ..... \$45                  Except - Env. &amp; Eng. .... \$30                  Nonmembers &amp; walk-ups ..... \$35                  Emeritus/Honorary members..... \$15</p>	<p><b>1</b>  <b>18th Annual PESGB-HGS Africa Conference</b>  <i>London</i></p>	<p><b>2</b></p>
<p><b>6</b></p>	<p><b>7</b> <b>HGS&amp; GSH Joint General Dinner Meeting</b>  <i>"Plates to Prospects: Integration of Data at Multiple Scales to Enhance Exploration, with Insights from the Deepwater Fold and Thrust Belts Offshore Northeastern Mexico,"</i>                  Carl Watkins,                  Page 30</p>	<p><b>8</b>  <b>HGS Board Meeting</b>                  6 p.m.</p>	<p><b>9</b>  <b>HGS Environmental &amp; Engineering Dinner Meeting</b>  <i>"Update on the TBPG from the Executive Director,"</i> Rene Truan,                  Page 33</p>
<p><b>13</b></p>	<p><b>14</b>  <b>Career Development Series: Data Science and Analytics</b>  <i>Organized by HGS NeoGeos and SPE GCS Data Analytics Group</i>                  Karbach Brewery</p>	<p><b>15</b>  <b>HGS General Luncheon Meeting</b>  <i>"The Perfect Unconventional Resource Portfolio,"</i>                  Bill Fairhurst,                  Page 35</p>	<p><b>16</b>  <b>Earth Science Week</b></p>
<p><b>20</b>  <b>HGS Earth Science Week Field Trip</b>                  High Island, TX                  Page 34</p>	<p><b>21</b>  <b>HGS Golf Tournament</b>                  Sterling Country Club and Houston National Golf Club                  Page 14</p>	<p><b>22</b></p>	<p><b>23</b>  <b>GEOGULF 2019</b>                  Short Courses                  Page 8</p>
<p><b>27</b></p>	<p><b>28</b> <b>HGS North American Dinner Meeting</b>  <i>"Stratigraphic Controls on the Connectivity and Flow Performance of Deep-water Lobe-dominated Reservoirs" and "Stratigraphic Surface-based Modeling of Deep-water Reservoirs: Application to an Ultra-deep Gulf of Mexico Wilcox Asset,"</i> Page 44</p>	<p><b>29</b></p>	<p><b>30</b></p>

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# GEOEVENTS

Thursday

Friday

Saturday



<p>3</p>	<p>4</p> <p><b>Don't wait, make your reservations online at <a href="http://hgs.org">hgs.org</a></b></p>	<p>5</p> <p><b>First Annual HGS-GSH Family &amp; Friends Fall Fun Day</b>  <i>Rob Fleming Recreation Center, 6464 Creekside Forest Drive, The Woodlands</i>          Page 12</p>
<p>10</p>	<p>11</p>	<p>12</p> <p><b>Earth Science Week Celebration</b>  <i>Houston Museum of Natural Science</i>          Page 34</p>
<p>17</p>	<p>18</p>	<p>19</p>
<p>24</p> <p><b>GEOGULF 2019</b>  <i>Convention</i>          Page 8</p>	<p>25</p>	<p>26</p> <p><b>GEOGULF 2019</b>  <i>Field Trips</i>          Page 8</p>
<p>31</p>	<p><b>Reservations:</b>          The HGS prefers that you make your reservations on-line through the HGS website at <a href="http://www.hgs.org">www.hgs.org</a>. If you have no Internet access, you can e-mail <a href="mailto:office@hgs.org">office@hgs.org</a>, or call the office at 713-463-9476. <b>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.</b> 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 <a href="mailto:Webmaster@hgs.org">Webmaster@hgs.org</a>. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. <b>No-shows will be billed.</b></p>	

**October 4 – 5, 2019**  
 PS-AAPG West Coast Student Expo 2019  
*Bakersfield, California, USA*

**October 23 – 25, 2019**  
 GCAGS Annual Convention GeoGulf19  
*Houston, Texas, USA*  
 Page 4, 8-11

**November 6-7, 2019**  
 HGS Applied Geoscience Conference  
*Applied Geomechanics: Through the Life Cycle of the Field, Spring, Texas, USA, Page 16*

**November 19-20, 2019**  
 First HGS/EAGE Conference on Latin America  
*South American Petroleum Plays for Future Decades of the Third Millennium, Houston, Texas, USA*  
 Page 22

**February 11 – 13, 2020**  
 AAPG Global Super Basins Leadership Conference  
*Sugar Land, Texas, USA*

**March 9 – 13, 2020**  
 CERAWEEK  
*Houston, Texas, USA*

**May 4 – 7, 2020**  
 Offshore Technology Conference  
*Houston, Texas, USA*

**June 7 – 10, 2020**  
 AAPG 2020 Annual Convention & Exhibition  
*Houston, Texas, USA*

**June 8 – 11, 2020**  
 EAGE Annual Conference & Exhibition  
*Amsterdam, The Netherlands*

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# Why I Do Volunteer Work for Houston Geological Society

## John Tubb, Jr.



**Editor: What society volunteer work have you done in your career?**

**John:** I have had the pleasure of serving the Lafayette Geological Society (LGS), Houston Geological Society (HGS), and the American Association of Petroleum Geologists (AAPG) in a myriad of ways over the years.

2013-2019 HGS Chairman of Office Committee

2011-2018 HGS Chairman of Legends Night

2010-2011 HGS President

2009-2010 HGS President-Elect

HGS Treasurer

HGS Treasurer-Elect

AAPG Delegate from HGS

1994-1998 AAPG Delegate from HGS

AAPG Delegate from HGS

1974-1975 Secretary of LGS

1974-1975 Chairman of Resolutions Committee for AAPG House of Delegates

1973-1976 AAPG Delegate from LGS

**Editor: What drove you to become such a dedicated volunteer for these societies?**

**John:** Early on as a geology student at SLI (now University of Louisiana-Lafayette) I started attending meetings hosted by the Lafayette Geological Society. After attending just a few events I realized that involvement in local societies as well as the AAPG was vital to my professional development. I moved back to Lafayette after graduate school. As I became more ingrained in the local Lafayette geoscience community, it became clear to me that volunteering for the LGS fulfilled my desire to help other geoscientists and that meant far more to me than being able to add accomplishments to my CV.

**Editor: When did you join AAPG?**

**John:** For me, joining the AAPG was no small feat. I applied to become an AAPG Student Member in 1958. At that time, AAPG required all prospective candidates to provide three business men and three Active Members of AAPG as sponsors. Despite the difficulties of obtaining all of the sponsors, I succeeded in becoming a Student Member. Once I graduated from University of Illinois in 1963, I applied for and was accepted as a Junior Member. By

this time Junior Membership only required three Active Member sponsors. After five more years, I still needed three Active Members to sponsor me for an Active Membership. Later I applied for DPA membership which required three DPA members as sponsors. The whole thing was quite an ordeal, and in my opinion a lot of overkill, nevertheless, to this day I have maintained my Active Membership status with the AAPG. Last year I received a certificate from AAPG stating that I had been an AAPG member for 60 years.

**Editor: Tell me about your time as an AAPG Delegate from HGS.**

**John:** Being an AAPG Delegate really showed me how strong the bonds between local societies and the AAPG really are. It also gave me endless opportunities to network with more established geologists as well as develop relationships with peers. I have witnessed five downturns during my career. Unfortunately, I was out of work during most of them, but through it all I can truly say that nothing substituted knowing my fellow geologists. During my career as a geologist, I have been employed at 6 different oil companies and consulted for 11 others. I got my first job via recruitment straight out of graduate school and the second job was found through my resume. The remaining four jobs I had as an employee were obtained entirely through the connections I had made through work, local geological societies and AAPG, or from recommendations from those geologists. Of the 11 consulting jobs, only ONE came from my resume, the remaining 10 were from people that I knew in the industry. My career scorecard shows that I'm 3:14 when it comes to resumes versus networking. In my case, mailing out resumes was simply a waste of trees. Networking not only advanced me in my career but also provided me with lifelong friendships.

**Editor: Why did you decide to serve on the HGS Board?**

**John:** Approximately one third of my career was in upper management for small to medium sized oil companies. I decided that my management experience could make me a great asset to the HGS Board so I threw my hat in the ring for the Treasurer-Elect position. Fortunately, I was elected and from there I ran for President-elect, which I was also fortunate enough to win. Serving on the Board gave me a better appreciation of the inner workings of the society. As President I was given the opportunity to meet more geologists and to interact with the HGS membership at large. If I had to choose two highlights of my professional career they would be receiving a PhD from the University of Illinois and being President of HGS.

*Why I Do Volunteer Work for Houston Geological Society continued on page 50*

## Why I Do Volunteer Work for Houston Geological Society continued from page 49

**Editor:** Your list shows that you were Chairman of two Committees after your time on the Board. Why did you volunteer for those committees?

**John:** During my year as HGS President, we restarted the Legends Night program that Charles Sternbach began during his term as President. We actively solicited sponsorship from area oil companies and the net profits from this event were given to HGS's two Scholarship funds. This proved to be a hugely successful program in that it enabled the scholarship funds to greatly increase the number of scholarships offered to outstanding geology students in the area. The success of the newly revitalized Legends Night program gave me the desire to serve as the committee Chairman from 2011-2018. In 2013, the Office Management Committee Chairman position became open and I decided that my experience with HGS and my

management expertise would be an asset to the position. Though I am no longer a member of the Board, the six years that I spent as Chairman for the Office Management Committee gave me an opportunity to continue serving a Society that I love and that has given me so much throughout my career.

**Editor:** Any final thoughts?

**John:** I would encourage all members to volunteer for HGS activities. Throughout the ups and downs in our industry, the HGS has been steadfast in its dedication to the geoscience community and this has largely been due to the passion of our volunteers. Taking on the responsibilities of volunteerism can at times feel like a thankless job but the impact you can have will stand the test of time. ■

### Museum of Natural Science Committee

The Museum of Natural Science committee started over 20 years ago with Clint Moore leading the way. Inda Immega took over as chair not long after that and the committee has been active the entire time. Janet Combes is now a co-chair after being a long-time member. There are roughly 100 geoscience volunteers at the museum at any one time.

**The Museum committee's current roles include:**

- Serving as an interface with the Houston Museum of Natural Science (HMNS) for HGS committees (and, occasionally, sister societies) that have events there.
- Onboarding HGS members who wish to volunteer at the Museum: helping them get the training and orientation that they need.
- Helping geoscience volunteers find roles at the Museum that make best use of their geoscience expertise, e.g. providing geoscience content and training for touch carts, providing training for docents in geoscience halls (Energy, Paleontology, Gems and Minerals).
- Serving as a part of the Earth Science Week Committee, HGS's largest annual outreach event.
- Helping to organize and staff the HGS and HMNS booths at the annual Houston Gem & Mineral Show (HGMS) in early November. On the Friday of this event, thousands of school children visit. On the Saturday, Scouts are the focus. Overseeing the HGMS participation are HMNS chair Inda Immega, and HGS chair Janet Combes.

Two years ago, this committee formed the "Energy Exchange" sub-committee under the leadership of Janet Combes and Karen

Oganowski. This group of about 140 volunteers has helped with docent documentation of the Hall, interpretation during special events, finding materials for the touch cart. Former HGS President John Adamick arranged the donation of a Gulf of Mexico seismic line for the touch cart that is one of the most used items. The Exchange has a series of lectures by and for members to expand our knowledge into lesser-known aspects of the energy industry. ■

**Dates of events hosted by HGS Museum of Natural Science Committee and Earth Science Week Committee for the remainder of 2019:**

Earth Science Week:	<b>October 13-19</b>
ESW Earth Science Celebration at HMNS:	<b>October 12</b>
ESW Field Trip:	<b>October 20</b>
HGMS Annual Exhibition:	<b>November 8-10</b>



## Earth Science Week Committee

The Earth Science Week (ESW) Committee is part of HGS's outreach program. We host the Earth Science Week Celebration at the Houston Museum of Natural Science every October. This event is part of Earth Science Week, an international celebration of Earth Science coordinated by the American Geosciences Institute (AGI). HGS was with the AGI from the start in 1998 and the HGS ESW has been recognized as the longest running, largest ESW activity in the USA. Inda Immega and Janet Combes started out as HGS ESW committee chairs and the committee has had several leaders over the years. Currently, Sharon Choens serves as Chair and Lynn Travis as Co-chair.



### EARTH SCIENCE WEEK HOUSTON

The passport stations feature hands-on geoscience activities and interactive science demonstrations designed to inspire the Geoscientists of tomorrow. As participants interact with experts and ask questions, their passport is stamped. Whenever the passport is complete, students go to the Headquarters table for a prize.

Teachers attending the event receive an AGI Toolkit for their classrooms.

The Toolkits have learning resources and activities designed to engage students in the geosciences.

Houston's Earth Science Week observance includes a field trip, sponsored and staffed by HGS. The field trip is open to the public. The committee makes a special effort to reach out to area community college geology students. Past field trips have been to Whiskey Bridge, Brazos River, High Island, Panther Creek and the Wiess Energy Hall.

The Earth Science Week Celebration is coordinated very closely with the Houston Museum of Natural Science Committee. ■

Students of all ages are encouraged to join us in discovering the Earth Sciences. Participants receive a "passport" which guides them through passport stations located in the Glassell Hall, Morian Paleontology Hall Lobby and Wiess Energy Hall. Geoscientists who share their knowledge and enthusiasm about the Earth staff the passport stations. The geoscientists are from energy companies, museum volunteers, geoscience societies and local universities.



# Congratulations to HGS Member Inda Immega for Winning the Texas A&M University Michel T. Halbouty Medal

In June of this year, 2019, Inda Immega received the Houston Geological Society's Lifetime Membership Award. The HGS Honorary Life Membership honors members who have distinguished themselves in the science of geology or have contributed outstanding service to the success and welfare of this organization.

On August 15, 2019, Inda Immega was notified that she had won the Texas A&M University, College of Geosciences, Michel T. Halbouty Medal.

To quote from the website <https://geosciences.tamu.edu/about/awards-recognition/halbouty-medal/index.php> "The Michel T. Halbouty Geosciences Medal is conferred by the Dean, College of Geosciences, for distinguished achievement in the development of earth resources and in the application of geoscience to the discovery, use and conservation of earth resources. The recipient must be a graduate of Texas A&M University, or must have served Texas A&M University as a member of its faculty, staff, or administration and the candidate must be living at the time

of selection and be willing to present himself or herself in person to receive the medal at a time and place designated by the Dean, College of Geosciences (to be awarded in the Fall of each year)." The presentation will be in College Station in October.

Nominees for the Halbouty award are selected "for their substantive contributions to exploration, development or conservation of earth resources. Contributions may be in a variety of forms such as substantial advancement of the techniques for applying geoscientific knowledge to technological, economic, and social problems; farsighted and dynamic direction of resource development efforts by industry; innovative leadership in the administration of research and teaching related to earth resources exploration, development and conservation; and substantive contributions to public understanding of the importance of earth resources."

Please extend your congratulations to Inda Immega for having her contributions recognized, and for her long term efforts with the Houston Geological Society. ■



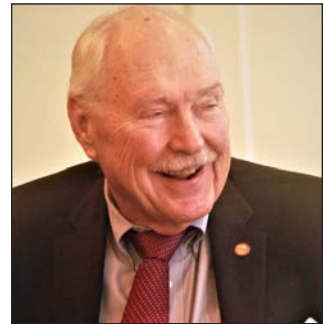
# 2019 Past Presidents' Lunch

On Friday, September 6th, 2019, 17 past HGS presidents joined current HGS president Jon Blickwede for a lunch at the Petroleum Club of Houston.



The Attendees include:

back row, left to right: Craig Moore, Sandi Barber, Dave Rensink, Craig Dingler, Steve Levine, Steve Brachman, Jeff Lund, and John Tubb Jr.  
front row: Kara Bennett, Dick Bishop, Cheryl Desforges, Jeff Morris, Deborah Sacrey, Paul Hoffman, Tony Reso, Dan Smith, and Jon Blickwede



# Technological Utopia or Economic Apocalypse? Today's Oil Industry Embraces Both

## A report on AAPG-HGS's Joint Summer Seminar at Summer NAPE

*Susan Nash, PhD*

*Director of Innovation, Emerging Science and Technology, AAPG*

Everyone knows that the oil industry is a very different animal than before the 2014 oil price crash. It can be difficult to assess what the animal is, however, thanks to “binary twin” narratives of utopia and apocalypse that have come to shape the industry. With their ability to generate both euphoria and fear, the narratives destroy confidence. Thankfully, a recent “summer seminar” brought together the two narratives in a single event and provided illuminating insights for a clearer path forward.

Those who attended the AAPG-HGS Joint Seminar “The State and Future of Technology, Finance & Economics, Exploration & Production” on August 20th at Summer NAPE had an opportunity to explore the implications of both narratives as representatives of technology, finance, and operations participated in three separate panel discussions and fireside chats. This innovative format was developed and organized by Mark Hamzat O. Erogbogbo, with assistance by AAPG. Hamzat’s vision as a corporate strategist made the structure of the event uniquely valuable.

Thankfully, the euphoria-producing narratives appeared first, in the all-morning session dedicated to new technologies. The extremely high cost of drilling, completing, and producing shale oil and gas has been dramatically reduced by using new technologies that improve efficiencies and allow companies to trim their workforce and drill fewer wells that have higher recovery factors. Further, the use of blockchain technology is allowing better monitoring of performance as well as more efficient back-office operations. The euphoria is generated not only by the results produced by the new technologies, but also from the potential profitability of investments in start-ups. A number of companies such as Chevron, Shell, Saudi Aramco and Equinor invest directly in start-up technologies. Companies such as Frost & Sullivan and Darcy Partners act as both scouts and mentors along the way. Many operators have new technology and innovation centers, and they dedicate at least some of their operations to being a living laboratory for beta-testing the

innovations. The efforts often center around machine learning-focused simulations, modeling, information management (Sidd Gupta at Nesh) and imaging, along with blockchain technologies (Andrew Bruce at Data Gumbo). Making the land and legal work more efficient is also the focus of a breakthrough (Ashley



*From Right to Left Front Row: Ashley Gilmore (CEO, Tracts), Sidd Gupta (CEO, Nesh), Josh Adler (CEO, Source Water), Dr. Susan Nash (Director of Innovation & Emerging Science, AAPG), Andrew Bruce (CEO, Data Gumbo).*

*From Right to Left 2nd Row: Ethan Smith (Vice President, Frost & Sullivan), Travis Laman (CEO, DeltaPerform), Dawn James (Industry Solutions Manager, Microsoft), David Curtiss (Executive Director, AAPG).*



*From right to left bottom row: Felipe Armaza (Co-Founder, AI Driller), Ed Hirs (Strategic Energy Market Executive, BDO), Niyi Adisa (CTO, Siltstone Capital), Godswill Nwankwo (CEO, Effort Energy|Moderator), Dr. Susan Nash (Director of Innovation & Emerging Science, AAPG), Jeff Henningsen (President, Lockton Companies), Carlos A. Pineda (VP, Stage Completions), Jim Harden (Executive, Moss Adams), Anthony Skeryanc (Advanced Senior Geologist, Marathon Oil).*

*From right to left top row: Jonathan Parry (Managing Partner, Aedes Christi), Casey Minshew (CEO, Energy Funders), David Wishnow (Head of Energy Technology & Relationship Management, Darcy Partners), Hani Elshawawi (Digitalization Lead, Shell Technology Center), Jim Sledzick (Saudi Aramco Ventures), Mark Hamzat O. Erogbogbo (Corporate Strategist, Effort Energy).*



Gilmore at Tracts). Wearable sensors for improved safety (Travis Laman at DeltaPerform) and water treatment and sourcing improvements (Josh Adler at Source Water). Guiding the start-ups are companies such as Frost & Sullivan (Ethan Smith), while Microsoft provides enterprise digitalization support. The potential for technology to be dramatically transformational and to turn now marginal (or money-losing) plays into sustainable, profitable, and environmentally friendly ones was the underlying theme. The fact that technology is accessible to all was emphasized by Trond Ellefsen from Invatare; with the notion that companies of all sizes and scales of operations can find a way to be profitable.

The fear-inducing apocalyptic narrative kept the audience awake in the usually soporific after-lunch sessions. Economics and financial executives, Jeff Henningsen, Ed Hirs, Casey Minshaw, and Jim Harden, pointed out that North American exploration and production companies saw their net debt rise from \$50 billion in 2005 to nearly \$200 billion by 2015. Service companies also entered into massive debt positions, since large capital expenditures were required to be able to meet the needs of their clients. As several pointed out, in 2018, uncertainty gripped the industry as it seemed that some of the largest companies would not be able to restructure their debt. The debt problem continues to make headlines in *The New York Times* and *The Wall Street Journal*, and more apocalyptic of financial reporters regularly question whether or not the debt trap will trigger another financial crisis. The result is that there is little appetite for funding new ventures, and private equity funds are retreating rapidly from the scene. However, consolidations are the norm, and will continue to be so as they are viewed as a solution that has both short-term and long-term efficiency benefits. The price of oil is expected to continue to stay fairly low, and the public is expected to remain hostile toward carbon-derived energy. Although the outlook was gloomy, there were glimmers of optimism and enthusiasm with respect to mergers and acquisitions, and the technological transformations that would make operations profitable.

The third session featured operations. The fireside chat structure of this session, facilitated by Godswill Nwankwo made it possible for individuals to speak openly and informally about their views of the trends of the last few years, and the directions that are most likely to be the true path forward. The potential of new technology combined with tight funds united for a general consensus that the oil field of the future will have fewer people, more automation, and better placement of laterals. Felipe Armaza from AI Driller and Carlos Pineda from Stage Completions pointed out that people who will thrive in this environment will be the ones who manage data from diverse sources, make data-driven decisions quickly, and who are able to detect when the models may not be accurate. Hani Elshawi from Shell Technology pointed out the importance of being agile with respect to technology and innovation. What it means for all geoscientists and engineers is that not only do they need to be able to integrate data and work with multiple software platforms and applications, they also need to understand how the

real-world physical fundamentals (the rocks, the reservoirs, the produced fluids) look and behave in the digital realm.

The binary opposition of the two prevailing narratives in today's energy industry is likely to stay in place for the foreseeable future, and while it can be confusing for a person who is trying to launch a career or put together a deal, understanding the underlying reasons for them can equip one for success. ■

### Upstream Oil & Gas Professionals Hiring Event

The SPE – GCS invites you to participate in the 6th edition of the “Upstream Oil & Gas Professionals Hiring Event,” October 15th, 2019 at Trini Mendenhall Center.

Following the success of the inaugural event in March 2017, we continue to provide a platform connecting experienced job seekers with upstream oil and gas companies to fill open positions. This is also a platform to help the industry retain qualified and experienced professionals, preventing losing them during the industry's hard times. The SPE is partnering with other organizations to make the event a mirror of the oil industry. Thus, all upstream disciplines are invited to participate in the event. For more information visit <https://spegcs-mit-hiringevent.org/>.

Society of Petroleum Engineers - Gulf Coast Section




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15 Oct 2019 · Houston, Texas



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PROFESSIONALS HIRING EVENT

Trini Mendenhall Community Center 1414 Wirt Rd







# University of Houston Team Wins IBA Competition at AAPG ACE Meeting in San Antonio

by Professor Paul Mann, University of Houston

A team of five graduate geoscience students from the University of Houston topped more than 300 teams from around the world to win the 2019 Imperial Barrel Award. The annual IBA competition, sponsored by the AAPG, requires teams of geoscience graduate students to evaluate industry datasets from prospective petroleum-rich basins, using state-of-the-art software and technology. The semi-finals for the Gulf Coast section of teams, representing 10 universities in the Gulf states of Texas, Louisiana, Alabama, and Mississippi, was held at Anadarko in The Woodlands in April 2019, and the world competition was held in San Antonio in June in conjunction with the AAPG-ACE annual convention. The UH team received the Imperial Barrel Award trophy and a check for \$20,000, which will be used to support the activities of the Department of Earth and Atmospheric Sciences and the AAPG "Wildcatters" student chapter. A UH team also won the international competition in 2017, making UH one of just two universities to have won it more than once. The University of Louisiana at Lafayette has won first place in 2012, 2014 and 2018.

All team members are from the UH Department of Earth and Atmospheric Sciences in the College of Natural Sciences and Mathematics and include PhD candidates Aydin Shahtakhtinsky

(team captain) and Spencer Fuston and master's degree candidates Jacob Miller, Patrick Chandler and Andrew Stearns. The team was judged on the quality of their 25-minute PowerPoint presentation of prospects and leads based on the team's analysis of a 2D and 3D seismic dataset tied to wells located in the North Carnarvon basin on the northwestern margin of Australia. UH faculty advisors included Paul Mann, John Castagna and Kurt Rudolph. Houston area industry advisors included Gary Guthrie (retired, Marathon Oil) and Reynaldo Cardona (Chevron).

At the same meeting, a University of Houston PhD student, Jack Kenning, won first place in the AAPG student poster competition for his presentation on the structure and stratigraphy of the Mexican Ridges in the western Gulf of Mexico. ■



## Houston Gem & Mineral Society

66th Annual Gem, Mineral, Jewelry & Fossil Show

November 8-10, 2019  
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# HGS Networking Workshop at the AAPG Student Expo – 5 September 2019



AAPG annually sponsors a recruiting event for current and recent students in Houston in September. This year, for the first time, HGS sponsored a workshop on Networking for interested attendees, adding to the several workshops on technical topics including Well Log Analysis, Microseismic Monitoring, Machine Learning 101, Geosteering and an off-site core lab tour of the W.D. Von Gonten facility. HGS NeoGeos also distributed travel grants to several students to aid in the travel cost for out-of-state attendees. There was a modest cost and the workshop was attended by 40 Expo attendees, facilitated by Casey Langdon, NeoGeos Chair. AAPG President Mike Party, HGS President Jon Blickwede and other experienced geoscientists provided comments and mentored students on networking and interview practice. The

workshop packed a lot into three hours, including a networking overview, table discussions among the students and working professionals, and “lightening round” presentations by the students of their backgrounds and interests in order to prepare them for the recruiting portion of the Expo.

HGS NeoGeos participating in the planning and execution of this event included coordination with AAPG staff to plan the short course, designing the workshop, recruiting volunteers, and running the event. The student attendees were pleased with the workshop, and getting to know the activities of the HGS. The modest cost and solid useful program should ensure that this workshop is added to the program for future AAPG Student Expos. ■





# HGS Welcomes New Members

## New Members Effective September 2019

### ACTIVE MEMBERS

Jesse Berney  
 Mike Hale  
 Sudeep Kanungo  
 Les Kelso  
 Adam Kruse  
 Ji Soo Lee  
 Guy McCardle  
 Raul Notta  
 Godswill Nwankwo  
 James Pindell  
 Nathan Schlagel  
 Razza Shah

James Shultz  
 Christopher Smith

### EMERITUS MEMBERS

Burton Bowen

### STUDENT MEMBERS

Kevin Bain  
 Dhruvad Beti  
 Michael Braunagel  
 Blake Cedillo  
 Hang Deng  
 Steven Follmer

Francisco Javier  
 Marco Herrera  
 Ninjie Hu  
 Jacob Miller  
 Kristen Morris  
 Minh Nguyen  
 Thomas Quintero  
 Bryan Rodriguez  
 Allison Scates  
 Dawid Szafranski  
 Julia Visy  
 Leslie Young

*Welcome New Members*

## Remembrance

JAMES EDWARD SCOTT, III  
 1936-2019

**James Edward Scott III**, 83, of Houston, Texas, passed away peacefully on September 6th, 2019 near his home in Houston. Jim was a graduate of The University of Houston where he achieved his BS in Geology. Jim went on to be an exceedingly successful geologist, working for companies such as Unocal, HuffCo, and eventually his own company, Tradewinds Oil & Gas that he operated for 30 years. He was a highly-respected geologist, pursuing domestic and international oil & gas projects across the world. James joined HGS in 1999.

James is survived by his wife, Brenda Ann Scott of 48 years, five sons, one sister and two grandchildren. Jim was preceded in death by his parents, his brother, and daughter. ■

– This Remembrance was summarized from the Life Tributes section of the *Houston Chronicle* dated September 13, 2019



### HGS Bulletin Instructions to Authors

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

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

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

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

### HGS Bulletin Advertising

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

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

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

### Website Advertising Opportunities

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

Placement	Rate	Specifications/Description
HGS Website Home Page Banner Ad	\$800 – Monthly	275 x 875 pixels; home page top banner ad. All Home Page Banner Ads rotate every 10 seconds.
	\$1800 – 3 Months	
	\$2800 – 6 Months	
	\$3600 – 12 Months	
HGS Website Home Page Column Ad	\$700 – Monthly	200 x 400 pixels; home page right column ad
	\$1500 – 3 Months	
	\$2400 – 6 Months	
HGS Website Event Page Ad	\$600 – Monthly	200 x 400 pixels; calendar page left column ad. All Event Page Ads rotate every 10 seconds.
	\$1200 – 3 Months	
	\$1600 – 6 Months	
	\$2600 – 12 Months	
Geo-Jobs	\$50 – 14 days	Posting of job opportunities on HGS website. Click the Geo-Jobs tab to get started. Must be filled out completely and the dates set appropriately.
	\$100 – 30 days	
	\$300 – 3 Months	
	\$600 – 6 Months	
Vendor Corner	\$250	Company logo, company website, and company description will be highlighted on HGS Calendar website event. This is an opportunity to display company wares, gain personnel exposure and hand out product information at HGS dinner meetings.
	*4 Pack option with 1 FREE bonus event for \$1000.00 available.	
	Send request to vendorcorner@hgs.org.	
Event/Short Course Calendar Ad	\$100 – Monthly	An event ad posted within the HGS website calendar under the Events tab.
Bundle & Save!	<ul style="list-style-type: none"> <li>• 30% off website ads when combined with print ads in all 10 HGS <i>Bulletin</i> issues.</li> <li>• 20% off website ads when combined with print ads in 5 HGS <i>Bulletin</i> issues.</li> <li>• 10% off website ads when combined with print ads in 3 <i>Bulletin</i> issues.</li> </ul>	



# 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](http://www.hgs.org) and click on Join HGS  
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Mail this application and payment to:

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**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.

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Degree \_\_\_\_\_ Major \_\_\_\_\_ Year \_\_\_\_\_

School \_\_\_\_\_

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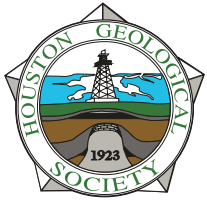
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