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Houston Geological Society
Volume 61, Number 6
February 2019

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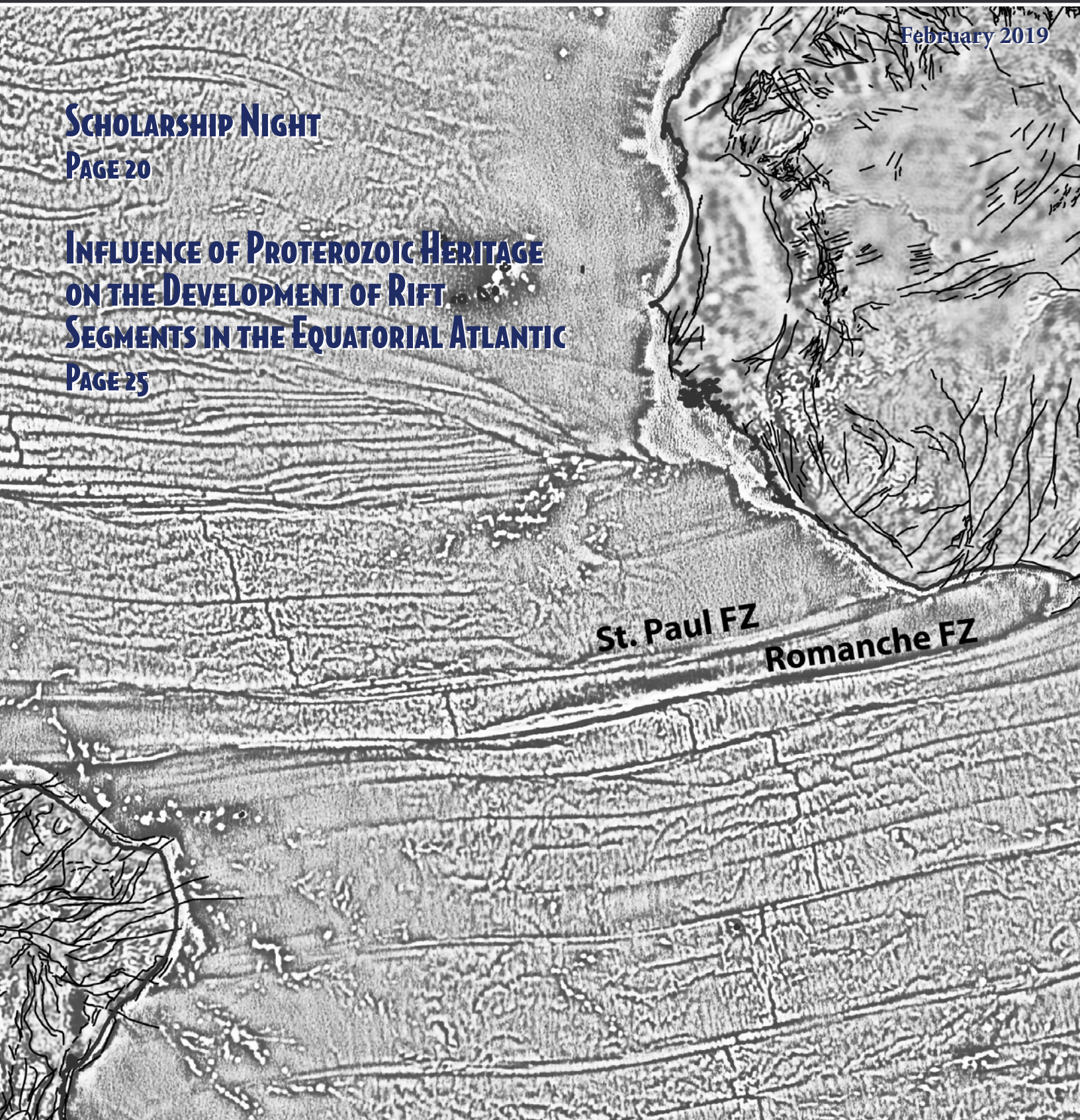

The Bulletin
Houston Geological Society

Volume 61, Number 6 February 2019

In Every Issue

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Technical Meetings

Other Features

About the Cover: : Present Structural grain of he Central Atlantic Ocean.
Image courtesy of Ana Krueger

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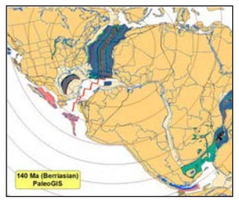

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The Only Thing Constant is Change

It seems like January was destined to be the month that I was supposed to sit back and reflect on changes that had occurred in the Oil and Gas Industry over the span of my full-time career in the Industry, since May 1975. This period of reflection was initially set off by Bill DeMis' January 14 HGS General Dinner Meeting presentation, "Haynesville Shale Gas Play: A U S Renaissance Driven by Technical Innovations," then reinforced by Denise Cox's President's Column in the January AAPG *Explorer*, "Exploring Creative and Collaborative Space to 'Recycle' Petroleum Basins", which referenced "Thinking Outside the Play" by Guy Loftus, *GeoExPro Magazine* vol.15, no. 2, 2018. I could identify with all that was said. Both described innovation driven change. Since 1975 I have seen innovation driven change from various disciplines tremendously transform the Oil and Gas Industry.

The following is my recollection from a geology perspective.
As I suspect most "new hires" do in their first full-time job, I imprinted that first day in my memory. I vividly remember my first day working for AtlanticRichfieldCompany – soon to be renamed ARCO – in their Houston San Felipe Green office. I was assigned to the Gulf of Mexico Offshore Exploration District, a small group of 2 Junior Geologists (Bronwyn Owens and me – and yes, that was our official job titles), 2 Senior Geologists (Chuck Jones and Charlie Barber) and a District Geologist (Jack Keplinger). We handled all of ARCO's Offshore GOM (Gulf of Mexico) shelf interest exploratory drilling and field development from the initial exploration drilling through field development over the geographic area from the mouth of the Mississippi to the Rio Grande River. There was no deepwater Gulf of Mexico exploration at that time. However, we were not part of the very secretive offshore lease sales group, but we got to work on what they and ARCO's partners won in lease sales. It was the era of paper, pencils, analog well logging, and radios. On that first morning, as I sat across Jack's work table, I asked what my job would be. I was eager to start. His answer has stayed with me my entire career: "Your job is to find out the technological limit of our drilling engineers' ability, and to develop geological prospects to drill for oil and gas reserves to that limit." I remember thinking that he had placed bounds on my imagination, but then as time went forward, I realized the limit he gave me was really open-ended, with only progressive limits that the drilling engineers were always expanding. They were always being driven to develop more technology to test ideas that geologists had envisioned beyond their existing capabilities. I began to appreciate the reason why ARCO circulated industry magazines and reports, like the weekly *PI* (IHS' predecessor) scout reports, the *Oil and Gas Journal* and *World Oil* – those were some of our windows into the broader industry world that might be beyond ARCO's immediate capability. From them we gained enough information to strike up a conversation with engineers and other geologists. ARCO also encouraged us to keep up with professional journals and attend HGS meetings to learn something new. I often wonder if Jack's instructions were because he knew that as we talked that day, the offshore industry was on a precipice and would have a milestone that would change it forever: Shell was drilling the first deep water exploratory well that became Mississippi Canyon Block 194 Field (known as Cognac). That first well, the Shell Amoco et al OCS-G 2638 No. 1 (API No. 60817400030000) was completed July 1975. It was the first of 12 expendable wells drilled to delineate the field, was drilled to a depth of 9,750' The resulting platform was set beyond the continental shelf edge in 1,025' of water which to that time was in the deepest water in which platform had ever been placed. Not impressive by today's standard, but definitely a game-changing milestone. Cognac pushed the envelope of the day not only in the

From the President *continued on page 17*

Nomination for HGS Teacher of the Year Award is Open

The HGS Teacher of the Year has been established to honor individuals whose extraordinary efforts or unique contributions are in earth science education. The selected Teacher is given a $500 cash award along with a plaque presented at a HGS Event. The HGS Teacher of the Year will be encouraged to apply to the GCAGS and AAPG Teacher of the Year Programs which offer greater cash bonuses ($1500 and $5000 respectfully). Application materials can be acquired by e-mailing the Awards Chairperson and should be mailed/e-mailed to the HGS Office by April 1. Materials should sent to Attn: Awards Chairman, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916. Questions can be sent to Mike Deming HGS Awards Chairperson at mike.deming.HGS@gmail.com.

The Houston Geological Society Continuing Education Committee Presents

Acquiring High Whole Quality Core: Comprehensive Course That Will Cover All Aspects of The Core Acquisition & Analysis Process

A One-Day Short Course by Howard Wood

Thursday, February 28, 2019 • 8:30 am

Pricing

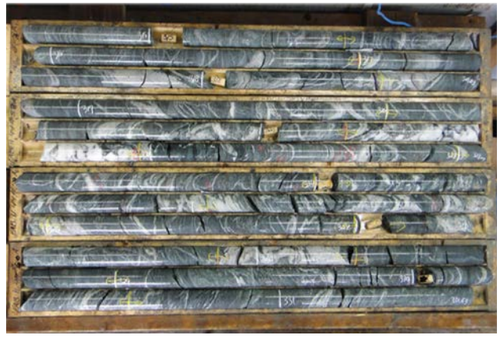
$125 for HGS members

Non-Members $150.00

Students $50.00

NO WALK-UPS ACCEPTED

Includes: Networking Lunch and Break refreshments.



Course Description

- Planning a Coring Program
- Coring Process and Value of Core Analysis
- Equipment Selection
- Selecting an Analysis Program
- Core Sampling
- Quality Control
- Porosity and Permeability Evaluation – Methodology
- SEM and Thin-Section Preparation and Evaluation
- Geomechanical Properties
- Tour of Core Analysis Lab

Biographical Sketch

Howard Wood is the Co-Founder & U.S. Sales Manager at Canamera Coring, Conroe, TX. He has 14 years of experience in the drilling & core acquisition industry beginning his career with Cameron International in Rock Springs Wyoming. In 2008, Howard joined ReedHycalog/NOV Coring Services, a company focused on working projects geared toward whole core acquisition domestically and abroad, and in his tenure, served as Account Manager – Gulf Coast, Europe Sales Manager – Aberdeen Scotland, and was the Executive Sales Manager in Houston, TX. He holds a Bachelor of Science from Texas A&M University, served 8 years in the United States Marine Corps and is an Eagle Scout.

Date: February 28, 2019 • 8:30am – 4:30pm

Location: Core Laboratories

6316 Windfern Road, Houston, TX 77040

Please make your reservations on-line through the Houston Geological Society website www.hgs.org

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

Jim Tucker
editor.hgs@hgs.org

A Busy Start

2019 is off to a flying start, and the meeting talks are hotter than the weather. I hope you have had a chance to see one or more of them. When permitted, our videorecording committee records them for viewing. Please browse them at: https://www.youtube.com/user/HGSGeoEducation/videos . It's quite an archive.

This month has lots to do for the shortest month. Our annual Scholarship Night dinner meeting is guaranteed to pass along a lesson or two from the distinguished speakers. Plus, you will have a chance to congratulate the student winners of our annual HGS Undergraduate and Calvert graduate scholarships. Come and meet some of our future colleagues. The E&E, International, Northsiders', and annual ethics programs also fill the calendar.

Spring is the season for student events. The student research day at the University of Houston is coming soon, and we will have details when it is set. The annual Industry-Rice Earth Science Symposium (IRESS) will be held 21-22 March, with the theme of "Minerals and Energy: Science, Economics and Policy", followed by Rice night at the HGS 8 April dinner meeting.

Core workshops are always a great opportunity to learn and to refresh your observation and description skills. Our next one is 28 February at the Core Laboratory facilities, and it is filling up. See details in this *Bulletin*.

Preparations are now underway for HGS Members to participate in the organization of the next SPE Members in Transition hiring event on 26 March. Quite a few companies are interviewing engineers and geoscientists at these events, and it is beneficial to volunteer if you have the time, and want to be on the inside of this event. Contact me if you are interested in volunteering for this very well organized program. Attendee information at: https://www.spegcs.org/events/4212/ .

At this writing, there are still a few available slots on the March field trip to the Big Bend State Park, and signup information is elsewhere in this *Bulletin*. A beautiful time of the year in West Texas. And, in addition to the technical meetings, trip and social events, the HGS year will wrap up with a Guest Night meeting at the Museum of Natural History on 8 June.

Have a safe month, and volunteer for something. ■

Lessons from a Career

The Gulf Years

Moving from the Midcontinent to the offshore Gulf Coast in 1980 was quite an eye-opener. The Tulsa district was a pretty slow exploration area for ARCO, with a focus on development and responding to forced pooling requests on all the legacy Held-by-Production (HBP) and fee acreage. The offshore Gulf of Mexico (GoM) was a very active area for ARCO, once company funds became available after the completion of the Alaska Pipeline. At one time in the early 1980s, the offshore GoM spending was separately listed in the Annual Report, the only area of the company to be so noted.

But, I was initially assigned to development, which focused on the partnership areas. These long-time partnerships termed CAGC (Conoco-AtlanticRichfieldCompany-Getty-Cities Service) were ARCO's entry into the Gulf, and quite successful on the shelf. While the excitement was thought to be in the lease sales and company-operated wildcats, I learned a lot, particularly about faults, which as a structural geologist, I had been studying for years. But the comparatively good two-dimensional offshore reflection seismic data, and lots of drilling allowed for very detailed fault plane mapping. The spidery pattern of multiple well boreholes ranging out from platforms allowed precise fault mapping, and I even mapped a corrugated fault plane!

Lesson: There is a lot to be learned in data-rich areas, and some of it will be new and enlarging what you think you already know.

I then was assigned to do regional GoM mapping and reconnaissance. This sort of subsurface information had long resided in colleagues' brains, but there was beginning to be regional compilations of geological information from all sources by

Early Lessons *continued on page 17*

2019 Applied Geoscience Conference
1st "Subsurface Intelligence and Analytics" Conference

FREE SHORT COURSE

Analytics: How to Trigger Enlightenment

and Avoid Hype

Presented By: Andrew Silver, Adret LLC
http://adret-llc.com/

5th – 6th March 2019
Anadarko Petroleum Allison Tower
The Woodlands, TX

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Jason Simmons, Co-Chair
With Subsurface Digital Industry Experts

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2019 Applied Geoscience Conference
1st "Subsurface Intelligence and Analytics"

Conference Overview

The 1st HGS Applied Geoscience Conference on Subsurface Intelligence / Digital Oil and Gas will be held in The Woodlands, TX in March 2019.

Digital Transformation of the Geoscience. When you ask an industry professional to define digital transformation, you find that the words mean something different to everyone. However, one idea permeates, this could be a potential paradigm shift in the industry. How do we get from bytes to barrels, particularly in the Applied Geosciences field? A report from the World Economic Forum in 2017 states that Digital Transformation in the Oil and Gas industry could generate between $1.6 to $2.5 trillion for the industry, customers, and greater society over the next decade. The Economist (May 6, 2017) recently stated that "the world's most valuable resource is no longer oil, but data." What direction is the industry heading? What initiatives are currently ongoing?

The Two-day conference will cover the questions above and key issues related to the Applied Geosciences field: big data and advanced analytics, reliability and productivity, leveraging the cloud, and digital transformation of the Geoscience Discipline.

The workshop is open to a variety of topics and ideas, both from the industry and academia.

Conference Objectives

The main objective of this is to **achieve a better understanding of current digital work flows in the Geoscience disciplines as well as the latest advancements in utilizing new Digital Technologies.** We hope to create a collaborative environment between Geoscience and Industry professionals to present and discuss the Digital Transformation and fresh ideas that may apply to your workflows.

Who Should Attend

Consultants, Academics, Technology, and Industry professionals will all be suited for this event. The list of topics will focus on Applied Geosciences and new digital technology, but will include discussions across the E&P lifecycle.

Sessions & Schedule	Main Topic	Topic Focus Areas
Opening Remarks		Applied Geoscience Committee Chairman: Rebecca Morgan & Jason Simmons of Baker Hughes, A GE Company
FREE Short Course on Day 1	**Presented by: Andrew Silver, Adret LLC**	This two-hour workshop focuses on key concepts necessary for the task of understanding the essential interplay of domain expertise, statistics, and automation in building analytics implementations. Using upstream, interdisciplinary O&G examples, it introduces approaches to analytics workflows, feature engineering, data wrangling, choosing appropriate statistical algorithms, and assessing statistical validity.
Session 1	**Automation– Reliability and Productivity**	The challenges to increase reliability and productivity through automation in the digital world. This theme will explore how the Geosciences are turning to automation for faster decision-making. Ideally the session will capture where industry-leading automation is occurring in the Geoscience field.
Session 2	**Leveraging Cloud and Machine Learning to Transform How Geoscientists Work Data**	With more and more data being captured, how are companies storing and accessing the data? This theme will examine how Geoscience databases are changing and the latest topics for streamlining data in different workflows. What are the best approaches to storing and accessing Geoscience data?
Session 3	**Digital Transformation of the Geosciences - Hype or Hope**	The theme focuses on the Geoscience disciplines (Geology, Petrophysics, Reservoir Engineering, Geophysics, and Geochemistry) and new digital efforts ongoing in each of them.
Session 4	**Machine Learning and Data Analytics in Exploration and Production**	New technologies and advanced analytics are leading to updated workflows. Are we becoming more efficient in our workflows? How do we find more in Exploration? How do we produce more in Production? How are the subsurface data being transformed and utilized in modern workflows?
Posters	**Student Poster Session**	
Closing	**Speaker and Poster Awards**	

2019 Applied Geoscience Conference
1st "Subsurface Intelligence and Analytics"

Submission Guidelines

We welcome submissions of all types, such as papers, case studies or reviews of new industry digital trends. We invite speakers to submit an abstract of maximum one (1) page (not exceeding 300 words). The information contained in your abstract is the basis for the acceptance of your paper into the program. The technical committee will look for content containing strong technical and innovative content.
We ask you to refrain from commercialism and focus on the promotion of subsurface intelligence and digital transformation as it applies to Geoscience. Submissions will be accepted online by emailing us at AGC2019@hgs.org .

Important Dates

Registration open	31st August 2018
Early bird deadline	February 1, 2019
Walk-up Registration	With availability

Fees

HGS members Early Bird $400 / Non-member $500

General Registration HGS members $450 / Non-member $550

1 Day HGS Member Registration $200 / non-member $250

Student Registration $100

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Enhance your visibility and corporate image by participating as a "Conference Sponsor" and presenting your technical expertise to a focused and exclusive regional audience. The conference offers a variety of sponsorship categories on a first-come basis. Companies interested are invited to Contact Thomas Reed @ thomasreed979@gmail.com or Andrea Peoples at andrea@hgs.org or call the HGS office at 713-463-9476

2019 Applied Geoscience Conference

March 5-6, 2019

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2019 Applied Geoscience Conference

March 5-6, 2019

1st Subsurface Intelligence and Analytics Conference

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

For more information please visit: www.hgs.org

2019 Applied Geoscience Conference

March 5-6, 2019

Oral Presentations – Tuesday, March 5, 2019

7:00	**Registration and Coffee**	
8:30 am - 10:30 am	Short Course- Analytics: How to Trigger Enlightenment and Avoid Hype	**Andrew Silver**, *Adret LLC*
	Session 1: Automation - Reliability and Productivity **Chairs:** Steve Geetan and Sachin Ghorpade	
10:30 am - 11:00 am	**Coffee Break, Posters**	
11:00 am - 11:30 am	Automated Geosteering using a Bayesian Network	**Hugh Winkler,** *Factor Technology*
11:30 am-12:00 pm	Combined Automation of Geologic Log Correlation and Directional Drilling	**Bill Chmela**
12:00 pm - 1:00 pm	**Lunch, Posters**	
1:00 pm - 1:30 pm	Transforming Well Path Planning: You Can Plan the Most Productive Well and Drill it, too	**David Cotrell**, *Baker Hughes, a GE company*
1:30 pm - 2:00 pm	Automated Log Editing Using Machine Learning	Fred Jensen, *CGG*
2:00 pm - 2:30 pm	**Coffee Break, Posters**	
	Session 2: Leveraging Cloud and Machine Learning to Transform How Geoscientists Work Data **Chairs:** Barbara Hill and Ana Ramirez	
2:30 pm - 3:00 pm	Transforming Seismic and Geoscience Data Workflows Utilizing Cloud and Machine Learning Technology	**John Adamick,** *Staurolite Consulting, LLC.*
3:00 pm - 3:30 pm	Using Multi-Attribute Seismic Neural Analysis from Interpretation Through Reservoir Estimation – A Full-Cycle Workflow	**Deborah K. Sacrey,** *Auburn Energy*
3:30 pm - 4:00 pm	Bootstrapping Lithology Classification	**Tobias Hoeink,** Marco van der Linden, Wendy Yang; *Baker Hughes, a GE company*
4:00 pm - 4:30 pm	Machine-Learned Mapping of Basin-wide Salt: Old Data – New Methods	**Scott Morris**, Tony Dupont, John Grace; *Earth Science Associates*
4:30 pm - 7:00 pm	**Networking Reception**	

Poster Session

Invited Presentations from Graduate Students

Open during Coffee and Lunch Breaks

2019 Applied Geoscience Conference

March 5-6, 2019

Oral Presentations – Wednesday, March 6, 2019

7:00	**Registration and Coffee**	
	Session 3: Digital Transformation of the Geosciences – Hype or Hope **Chairs:** Lisa Neelen and Mark Herkommer	
8:00 am - 9:00 am	**Key Note** How We Get From Bytes to Barrels in the Delaware Basin	**David O'Brien**, *Anadarko*
9:00 am - 9:30 am	Evolution of Drilling Data and Geological Data Utilization in Drilling Optimization	**Ernest Onyia**, *GPRESS Energy, LLC*
9:30 am - 10:00 am	(Artificially) Intelligent Methods to Maximize Value from Piston Core Geochemistry: An Example from Offshore Nigeria	**Benjamin Kirklan,** *Fieldwood Energy, LLC*
10:00 am - 10:30 am	**Coffee Break, Posters**	
10:30 am - 11:00 am	Spatial Seismic Waveform Analysis using Enhanced Similarity Algorithm	**Daniel De Lilla,** *Anadarko*, Olga Brusova
11:00 am - 11:30 am	Generative Adversarial Networks in Seismic Data Processing	**Stephen Alwon**, *Schlumberger*
11:30 am - 12:30 pm	**Lunch, Posters**	
	Session 4: Machine Learning and Data Analytics in Exploration and Production **Chairs:** John Adamick and Jessica Raines	
12:30 pm - 1:00 pm	Identifying New Drilling Areas in Midland Basin Integrating Geological Mapping, Predictive Analytics and GIS Technology	**Camilo Rodriguez**, *IHS Markit*
1:00 pm - 1:30 pm	The Use of Machine Learning to Enhance Faults and Fractures Detection in Seismic Data	**Hesham Refayee**, *dGB Earth Sciences*
1:30 pm - 2:00pm	Machine Learning-Based Approach to Assistive Well Log Correlation	**Seth Brazell**, *Anadarko*
2:00 pm - 2:30 pm	**Coffee Break, Posters**	
2:30 pm - 2:45 pm	**Poster Session Awards**	
2:45 pm - 3:15 pm	Applying Artificial Intelligence to Seismic Data for Enhanced Earth Modeling	**Richard Koseluk**, *Quantico Energy Solutions*
3:15 pm - 3:45 pm	Digital Transformation and Deep Learning in E&P	**Bode Omoboya**, *Bluware*
3:45 pm - 4:15 pm	Using Machine Learning for Fault Detection in Unconventional Reservoir Development	**Cody Comiskey**, *Anadarko (AAEP)*

2019 Applied Geoscience Conference

March 5-6, 2019

Posters – March 5–6, 2019

Poster Session Chair: Mike Effler

University	Student Name	Poster Topic
Colorado School of Mines	**Deep Joshi**	Applying Petroleum Industry Heritage to Characterize Water-Ice on Moon
Stanford University	**Anshuman Pradhan**	Creating Large Volumes of Labeled Training Data for Geophysical Estimation with Machine Learning: A Bayesian Approach
Texas A&M University	**See Yoon Lee**	Hierarchical Bayesian Modeling: Application Towards Production Results in the Eagle Ford Shale of South Texas
Texas A&M University	**Cuiting Qi**	The Application of Discriminant Analysis in Well Logging Evaluation of Low Permeability Reservoirs in Block Zhuang 62-66 of Wuhaozhuang Oilfield, Jiyang Depression
The University of Alabama	**Hao Wu**	From Learning Noise to Denoise Using Deep Convolution Neural Network: An Application of Seismic Noise Attenuation
The University of Oklahoma	**Rafael Pires de Lima**	Convolutional Neural Networks: If They Can Identify an Oncoming Car, Can They Identify Lithofacies in Core
The University of Oklahoma	**Saurabh Sinha**	Statistical Controls on Induced Seismicity
The University of Oklahoma	**Jing Zhang**	Azimuthal Anisotropy Analysis Application in Unconventional Reservoir Natural Fracture Network Interpretation: Using the Barnett Shale as an Example
The University of Texas Permian Basin	**Ashton Faulkner**	Paleoenvironment and Hydrocarbon Potential of the Cretaceous Mancos Shale in Rio Arriba County, New Mexico
University of Calgary	**Sochi Iwuoha**	Leveraging Big Data for Field-Scale Reservoir Analysis: A New Well-Log and Artificial Neural Network Technique for Recognizing Natural Fracture Zones in Tight Reservoirs
University of Houston	**Lian Jiang**	Influence of Data Quality and Distribution on Facies Classification with Machine Learning
University of Houston	**Wenyuan Zhang**	Characterizing Reservoir Anomalies Through FWI and Deep Learning of Crosswell Seismic Data

Participating Schools

Colorado School of Mines • Stanford University • Texas A&M University
The University of Alabama • The University of Oklahoma • The University of Texas Permian Basin
University of Calgary • University of Houston

Open During Coffee and Lunch Breaks

From the President continued from page 7

drilling realm, but it also helped launch the geosciences into a new era. A few years later I took a job with Sonat Exploration, who it turned out was one of Shell's partners in Cognac. The field was analyzed using every technology available at that time, including new seismic they called "3D". I remember helping to open many boxes of black and white printed seismic lines from the 3-D seismic survey Shell had shot. Remember, those were the days before the computer workstations and the only way to interpret seismic was looking at the prints – quite a laborious task for a 3D volume. All the new more detailed seismic helped refine the sequence stratigraphic principles that were codified in the late 1970s and early 1980s. The concepts of seismic attributes that were only mathematical concepts in the 1960s started to blossom so that today we can see sub-tuning thickness stratigraphy in shale plays that can be interpreted using sequence stratigraphic principles to find better production.

The only thing constant is change, or at least that's true with the right type of economics and government regulations. As Bill DeMis pointed out, we are fortunate enough to live in a country with a constitution and laws that mostly limit government's power, makes individual rights explicit, has private property ownership, and patent laws. Our form of government with free-market capitalism, and private property ownership has allowed for, and driven, successful technological progress.

The very fun ride I've been on so far is one of the best examples of Adam Smith's "Invisible Hand" that I can imagine. I know those geologists who are just starting out will experience just as many fabulous changes as I have experienced, if they understand that they are only restricted by their brains and imaginations. I hope the "new hires" today receive the instructions I got: push the envelop to find new reserves. ■

Lessons From a Career continued from page 7

universities and the USGS. Also, the deeper water (greater than 600 feet water depth or so) areas of the Gulf were opening to bidding on federal leases, and many questions arose about reservoir and petroleum presence. The Pleistocene section thickened enormously in deeper water areas, and biostratigraphic zones that were thought to be contemporaneous on the shelf, began to separate in time as the section thickened, exciting the paleontologists. There were a lot of piercement salt features in deepwater areas, thought to be critical in conveying the liquid petroleum from older, deeper source rocks. One salt feature on the abyssal plain deformed the ocean floor, and I figured it was a piston-like cylinder from the Jurassic mother salt. But there was no matching gravity anomaly, according to our top-notch potential fields group in Dallas. Gravity calculations including all the masses are pretty straightforward, but we figured this time they were wrong, since all salt had roots and no salt pendants had been described. We were wrong.

Lesson: Sometimes the simplest interpretations are the best, and assumptions and conventional wisdom must be questioned.

While the exploration job at that time could be boiled down to looking for north (counter-regional) dip, the story was not so simple off the shelf. Seismic-stratigraphic techniques were beginning to be used, as better marine seismic data with higher frequencies allowed depositional features to be mapped. The deeper water areas were not initially of interest to ARCO, since bottom-supported platforms were favored. I was assigned to cover Mississippi Canyon, Ewing Bank and Green Canyon areas during the first open-area federal lease sale 72 in 1983. A recent discovery of coarse-grained high-energy sediments were found far out on the Mississippi Fan in the DSDP Leg 96 drilling program encouraged companies that there might be reservoirs in the Pleistocene section. So, we participated in a group seismic shoot over the Mississippi Fan. Beautiful, high-frequency data with lodts of depositional features. Though not a seismologist, I was sent to the group shoot meeting to determine acquisition recording parameters. During the discussions of record length, constrained by recording rate and boat speed, a record length of 7-8 seconds was suggested. A voice from somewhere in the room said "you can't even see below the salt at that depth". Since rootless allochthonous salt was unheard of, everyone looked around to see who, and from what company made the comment. We never figured it out.

Lesson: Always question orthodoxy, particularly if it limits your interpretive ideas.

Since putting together regional interpretations involved gathering all sorts of disparate information, sometimes strange stuff found me. One day, one of our micropaleontologists brought a sample envelope and showed me some dark gray granules. Turns out they were magnetite octahedrons, ~1 mm size. The interval they were found in was where we thought there were two glacial unconformities closely stacked. We never figured out why there would be this mineralization at this stratigraphic level, and I still wonder about it at times.

Lesson: Get a reputation for being interested in odd details and you will see a lot of weird stuff.

Jim Tucker

GULF COAST ASSOCIATION OF GEOLOGICAL SOCIETIES

CALL FOR PAPERS

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The GCAGS Journal, the Journal of the Gulf Coast Association of Geological Societies, is soliciting manuscripts for the 2019 edition (our 8th volume). This peer-reviewed journal is focused on publishing studies of the geology of the onshore and offshore Gulf of Mexico. For the 2019 Journal, we are soliciting manuscripts particularly focused on the following themes, although other themes are welcome: Deepwater Gulf, Modern Technologies, Shale Play Assessment, Oil and Gas Field Studies, and the Mexico portion of Gulf of Mexico Basin.

Please submit an extended abstract of at least 600 words, including 1–2 representative figures, to the GCAGS Journal Editor, Bob Merrill, at rmerrill@catheart.com by December 15, 2018. Once topic is approved, a full manuscript must be submitted by April 2, 2019. GCAGS Convention presentations of Journal submissions are encouraged but not required. The 2019 Convention is scheduled for Houston, Texas.

Please visit www.gcags.org for open access to our seven previous volumes.

INTERESTED IN SERVING AS AN ASSOCIATE EDITOR?

The GCAGS Journal, a peer-reviewed Journal published yearly by the Gulf Coast Association of Geological Societies, is soliciting member societies for associate editors. You would be involved with managing the peer-review process for 1 to 3 manuscripts that are submitted for publication in the GCAGS Journal. Ideally associate editors will contribute their local knowledge and expertise to the editorial process. If you are interested in being an Associate Editor for the GCAGS Journal, please contact Bob Merrill at rmerrill@catheart.com.

CONGRATULATIONS! PRESIDENT'S AWARD FOR OUTSTANDING PAPER, GCAGS JOURNAL

The Gulf Coast Association of Geological Societies would like to congratulate Lauri A. Burke and co-authors Ofori N. Pearson, Scott A. Kinney, and Janet K. Pitman for their paper, "Methodology for correcting bottomhole temperatures acquired from wireline logging measurements in the onshore Gulf of Mexico Basin, USA" which was chosen to receive the President's Award for Outstanding Paper, GCAGS Journal (2018, vol. 7).

HGS Scholarship Night & Dinner Meeting

HGS Foundation Scholarship & Calvert Memorial Fund February 11, 2019
Speakers: Cindy Yeilding, Senior VP for BP and Robert Ryan, former VP of Global Exploration for Chevron
Location: The Norris Center, City Center, 816 Town and Country Blvd. #210

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HGS Scholarship Night
Dinner Meeting

Monday, February 11, 2019

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

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

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Speakers: ***Cindy Yeilding,*** *Senior VP BP*
Robert N. Ryan, *Retired VP of Global Exploration, Chevron*
Moderated by: ***Charles A. Sternbach,*** *President Star Creek Energy, and past President HGS and AAPG.*

Our HGS and Calvert student scholarship awardees will be attending to receive their awards at this meeting. This will be a great opportunity to meet and congratulate them and welcome them to our profession. Also, the candidates for the upcoming 2019-2020 HGS Board will be announced at this meeting.

Biographical Sketches

Cindy Yeilding is currently Senior Vice President, BP America. Previous roles include VP Gulf of Mexico Exploration & Appraisal, and Global Geoscience Research and Technology Manager for BP. Cindy earned her MSc in Geology from the University of North Carolina after receiving a BS in Geology from SMU.

Cindy has served as an American Association of Petroleum Geologists Distinguished Lecturer and was named a "Legend in Exploration" by AAPG. Cindy is currently the Vice Chair of the Offshore Technology Conference Board of Directors and serves on the Board of Directors of BPX&P. She is BP's Executive Sponsor for Princeton University and is a member of the Greater Houston Partnership Board of Directors. Cindy also serves on the Advisory Board for the Jackson School, University of Texas and the Executive Board of Dedman College, Southern Methodist University.

Cindy is active in promoting STEM education and conceived of and implemented the OTC Energy Challenge in 2017. Cindy has been recognized as one of Houston's Top 15 Business Women by the National Diversity Council, received a "2016 Women in Energy Leadership" award from the *Houston Business Journa*l and was named one of Houston's "50 Most Influential Women of 2016" by *Houston Woman* magazine.

Robert (Bobby) Ryan retired as Vice President – Global Exploration, for Chevron Upstream on May 1, 2018, after 15 years as head of the worldwide exploration program. He joined the company in 1979 as a geologist in the Offshore Division in New Orleans and held technical and management positions in exploration, production and business planning during his 39-year career. Key roles included Gulf of Mexico Exploration Manager, Assistant to the Senior Vice President – Upstream, Assistant to the Chairman and CEO of Texaco, Vice President – Indonesia Business Unit, and General Manager – International Exploration. He was a member of Chevron's Management Committee since 2001 and the Upstream Leadership Team since 2003.

In 1990, through the President's Commission on Executive Exchange in The White House, Ryan was appointed to the Office of the Assistant Secretary for Conservation and Renewable Energy in the U.S. Department of Energy in Washington, D.C., where he assisted with utility policy issues related to renewable energy and energy efficiency. He received a U.S. Presidential Commendation for his participation in the one-year program.

Ryan was the Texaco lead for the Upstream Integration Team for the Chevron and Texaco merger in 2000 and 2001 where he played a key role in redesigning Chevron's exploration effort. Under his leadership during and after the merger, Chevron took a disciplined, global view of the exploration business resulting in significant and competitive new resource additions that formed the foundation for long-term growth for the company.

Ryan served in several industry leadership roles including chairman of the Corporate Advisory Board of the American Association of Petroleum Geologists (AAPG); vice chairman of the Board of Advisors of the Energy & Geoscience Institute at the University of Utah; a member of the School of Earth Sciences Advisory Board at Stanford University, and a member of the Scientific Advisory Board of CASP affiliated with the Department of Earth Sciences at Cambridge University.

Ryan is currently a member of the Board of Advisors at the School of Science and Engineering at Tulane University, where he received the 2018 Outstanding Alumnus Award. He also received the Distinguished Service Award from AAPG in 2017 and was recognized for his leadership in Exploration by Wood Mackenzie with a Lifetime Achievement Award upon his retirement.

Ryan has BS and MS degrees in geology from Tulane University.

Charles A. Sternbach has explored for and discovered energy in the US and around the globe for 35 years. He was Staff Geologist for Shell Oil Company, Exploration Manager for Tom Jordan (Jordan Oil and Gas), President of First Place Energy (International frontier exploration) and is currently President of Star Creek Energy. Charles has a Ph.D. and MS in Geology from Rensselaer Polytechnic Institute and a BA in geology from Columbia University. He is also proudly a member of AAPG since 1980.

Charles has focused his efforts on Exploration Creativity, studying how explorers and their teams have found giant fields. He created and leads the popular AAPG Discovery Thinking Forums which have been standing room only events at annual AAPG conventions in North America (ACE) and around the world (ICE). These programs integrate geology, geophysics, and engineering into case studies of business success and impact.

There have been 19 Discovery Thinking Forums since 2008 with about 10,000 attendees. About 115 speakers have permitted their video presentations to be posted on the AAPG Search and Discovery Website with 40,000 viewings around the globe. In addition, Charles created the AAPG Playmaker program in 2012. These immersive 1-day forums on exploration creativity have been presented 10 times in the US, Canada, and Europe. More than 1,500 professionals have attended and presentations have received 10,000 web views around the world. More of these forums are planned. Charles believes case histories of successful explorers and their discoveries is a shortcut to wisdom. Every geologist around the globe raises the level of collective intelligence for all by sharing information and techniques. Critical insights fall into patterns that can be recognized and anticipated. The legacy of exploration literature forms a syllabus for future explorers. Technology enables preservation and communication of critical knowledge via the internet through programs like Search and Discovery, Datapages, and GIS spatial related databases. Prior to founding the Discovery Thinking forums, Charles founded the HGS Legends programs (as HGS president in 2000). He is a co-editor with Dr. Robert Merrill on the fifth installment of the AAPG memoir series Giant Fields of the Decade 2000-2010 (Memoir 113).

Charles resides in Houston, Texas, with is wife Linda, also a distinguished geophysical advisor. Charles is a leader in the global geological community: past president of AAPG, Gulf Coast Association of Geological Societies, Houston Geological Society, and the AAPG Division of Professional Affairs. He is an Honorary Member of AAPG, HGS, GCAGS, and DPA.

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HGS Scholarship Night Dinner Meeting

HGS Scholarship History

The Houston Geological Society has two scholarship programs. The HGS Undergraduate Foundation annually awards scholarships for area undergraduate geoscience students from Rice University, the University of Houston, Texas A&M University, the University of Texas, Sam Houston State University, Stephen F. Austin University, and Lamar University. These scholarship students are nominated by their departments. This fund is supported by donations from individuals and the HGS funds, the funds paid by generous service and product suppliers at the Vendor's Corner at HGS meetings, matching gifts and HGS social functions. The Foundation was established in 1985, and has provided over $300,000 in scholarships since then. Additional details are available at: https://www.hgs.org/hgs-undergraduate-foundation-fund .

The Warren L. and Florence Calvert Memorial Scholarships began in 1978, after the initial donation from the Calvert family in 1974. The stated purpose was "to assist worthy and needy geological students to pursue graduate studies in some branch of Economic Geology leading to a master's or doctor's degree at any accredited university of his choice". These are for graduate students, by application, and judged on their academic record, and potential to complete graduate school.

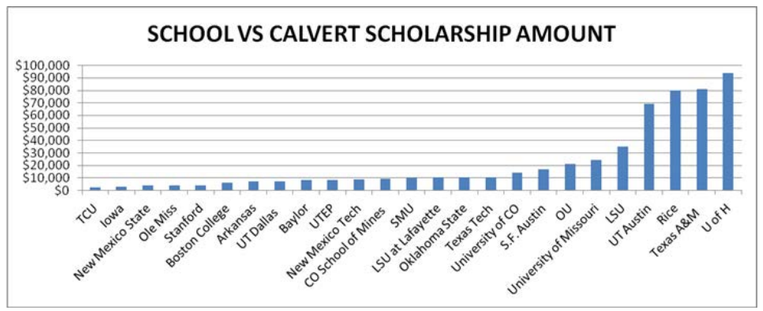
At present, $517,550 has been awarded to 178 recipients at 25 universities, averaging $2907.58 per year per student.

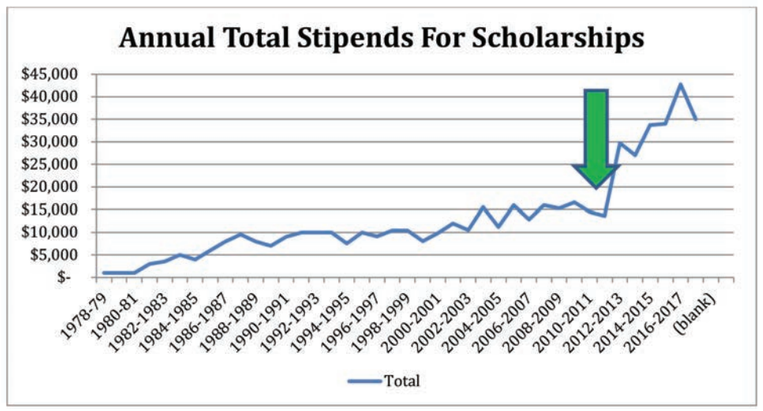
These 25 universities include the University of Houston (29), Texas A&M (28), University of Texas at Austin (24), Rice University (23), LSU (14), University of Oklahoma (9), University of Missouri and Stephen F. Austin State University (6 each), UT-Dallas, Oklahoma State, New Mexico Tech, University of Arkansas (4 each), University of Colorado, Texas Tech, SMU, LSU at Lafayette, Boston College (3 each), Stanford, University of Iowa, Colorado School of Mines, Baylor (2 each), and TCU, University of Mississippi, and New Mexico State (1 each)

There was an increase in scholarship funds distributed in recent years through the leadership of Dr. John Tubb, indicated below by the green arrow. This included funds from the annual HGS Scholarship Dinner Meeting,. The next one will be on 11 February 2019.

Further information is at: https://www.hgs.org/wl-calvert-memorial-scholarship.

This summary benefitted from contributions by Dick Bishop, Jeff Lund, Evelyn Medvin, and Carl Norman.





Wednesday, February 13, 2019

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

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

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Author: ***Brendan M. Brodie***
Environmental Resources Management, Sydney, Australia
brendan.brodie@erm.com
Speaker: ***Troy Meinen***
Environmental Resources Management, Houston, Texas
troy.meinen@erm.com

Overcoming Challenges for Successful Environmental Outcomes in Indonesia, Lessons for Work in Developing Countries

Recent projects have led to a better understanding of the limitations, obstacles and advantages that accompany investigating and delivering risk-based contaminated site management and remedial technologies to environmental work in Indonesia. For instance, non-technical regulatory limitations need to be overcome as the Ministry of the Environment and Forestry has recently started to impose environmental clean-up directives based on the current environmental regulations. Theses groundwater and soil regulations are interpreted somewhat vaguely, providing additional challenges of stakeholder negotiation and advocacy when implementing environmental site strategies. Additional logistical challenges from drilling to procurement of equipment to weather abound.

A review of challenges and advantages encountered to successfully complete work include, regulatory policies that are in development can be challenging to interpret, weather leading to flooding/Health and Safety issues, resourcing, supplies, equipment, accomadation of local customs/religious considerations, technical resource availability and mobility restrictions. Challenges also include importing equipment and local availability/quality, opportunistic theft and lack of environmental constructors. The use and availability of quality affordable labor along with determined problem solving have helped overcome those challenges.

Strategic use of the available resources and ingenuity along with stakeholder engagement overcoming challenges has led to successful environmental outcomes. Learning to work with and around these obstacles provides good lessons that can be applied for similar work in developing countries. ■

Biographical Sketches

Brendan Brodie is a Technical Director within ERM based in Sydney, New South Wales, Australia. He is currently undertaking a role in the management and technical support of remedial projects and advanced assessment techniques for ERM's Asia/Pacific Oil and Gas, Industrial, Power and Governmental clients. He is a registered licensed professional geologist and has two geological science degrees from the University of South Carolina in the United States. Prior to joining ERM in Australia, he co-founded and managed EnviroSouth Environmental Consultants from 2001 to 2013 and EarthCon Drilling and Construction from 2005 to 2012 and has a total of 21 years in the environmental consulting and environmental construction fields.

Troy Meinen is a Technical Director and Global Health and Safety Advisor with ERM in Houston. Over his 20-year career, he has worked on a wide variety of industrial facilities and upstream oil and gas projects to address contaminated ground water, soil and sediment issues. His background includes managing investigation and remediation of upstream oil and gas sites and assisting with due diligence for large oil and gas acreage position transactions for major Oil and Gas clients, which includes assessment of water use and protection, property transaction support, environmental impact assessment, environmental permitting and management, and Stakeholder concerns. He currently utilizes his field experience to support teams globally in improving health and safety performance in key ERM accounts.

Tuesday, February 19, 2019

HGS Northsiders
Luncheon Meeting

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

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

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Michelle Thompson, Jenn Pickering
Shell International Exploration & Production Company
Patricio Desjardins, Brian Driskill
Shell Exploration & Production Company

An Integrated View of the Petrology, Sedimentology, and Sequence Stratigraphy of the Wolfcamp Formation, Delaware Basin, Texas

Facies are stacked in predictive, repetitive packages that are linked to their position within a sequence stratigraphic framework. Four distinct cycles were identified: debrite, calciturbidite, fine-grained turbidite, and distal turbidite. The debrites and calciturbidites represent episodic events during low stands in sea-level where carbonate sediments from the platform are deposited in the basin. Fine-grained turbidites are thinly bedded and often interbedded with replacive microcrystalline dolomite are also deposited during low stands. Distal turbidites represent the most distal, muddy tails of turbidites where silty mudstones fine-upward into organic-rich, siliceous mudstones. Distal turbidites have the best reservoir quality and are thickest and more abundant during maximum flooding.

The sequence stratigraphic approach improves the lateral and vertical predictability of sweet spots and the zones/areas to stay away from, which ultimately drives appraisal and development decisions. Integrating our understanding of the cyclic nature of the Wolfcamp with the calibrated e-facies derived from logs in a stratigraphic framework allows for quick high-grading of acreage away from current control points support of development planning and new acreage evaluations.

The Wolfcamp A and B have been examined in detail in two proprietary cores from the central part of the Delaware Basin. Detailed sedimentological and petrographic techniques were employed to document the different facies types and bed boundaries, their characteristics, and associated rock properties to characterize the vertical changes in facies and reservoir properties. The robustness of the sequence stratigraphic framework was enhanced with seismic, biostratigraphic, geochemical, and sedimentological data from additional available cores from Reeves, Loving, and Ward Counties in Texas.

This study was conducted in 2016-2017 to advance the understanding of how small-scale elements, such as texture, composition, pore-types, and diagenesis affect the rock properties of the Wolfcamp Formation. The objectives of this study were to define key rock types from thin section (petrofacies) and core (lithofacies) to describe predictable, cyclic packages in a sequence stratigraphic framework to better understand what is controlling reservoir quality and its distribution in the Wolfcamp. ■

Urtec publication, reference URTeC: 2901513

Biographical Sketch

Michelle Thompson is a Sedimentary Petrologist with Shell International Exploration and Production, Inc., based in Houston, Texas. Michelle has nearly 15 years of industry experience in sedimentary petrology of mudstones, carbonates, and siliclastics between Core Laboratories and Shell. Michelle's efforts within Shell has been focused on a variety of projects in the Permian (Texas), Mexico, U.S. Gulf of Mexico, Argentina, and the Rockies. She holds a BSc. in geology from the University of Wisconsin-Oshkosh, MSc in geology from the University of Wisconsin-Milwaukee, and a PhD in geology from the University of Alaska-Fairbanks. Her MSc and PhD were both focused on the sedimentology and petrology of carbonates.

Monday, February 25, 2019

HGS International
Dinner Meeting

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

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

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Ana Krueger
Bluware
Katya Casey
Actus Veritas Geoscience LLC

Influence of Proterozoic Heritage on the Development of Rift Segments in the Equatorial Atlantic

By Ana Krueger

The last phase of Atlantic Ocean opening involved Late Albian rifting and separation of Africa and South America along the Equatorial Atlantic. Prior to the Albian, initiation and northward propagation of sea-floor spreading caused rotation of the South American plate and formation of two main rift systems in NE Brazil and West Africa: The Northeast Brazilian Rift System, consisting of the Reconcavo-Tucano-Jatoba (RTJ); Sergipe Alagoas/Gabon (SAG) and Cariri-Potiguar (CP) rifts in Brazil and the West- Central African Rift System (WCARS) in Africa. The Brazilian basins developed inside and around the Borborema Province, a key Proterozoic structure that controlled spatial and temporal differences between these rift systems. Our analysis of a new compilation of onshore and offshore faults of the Equatorial Atlantic led us to the conclusion that the segment bound by the Kribi and Bode Verde fracture zones south of Borborema acted as a link between intracontinental rifting to the north and late rifting stages in the Central Atlantic. During the Albian, this region acted as a "buffer zone", balancing, kinematically, in time and space, dextral strike-slip rifting in the Equatorial branch, with simultaneous sea floor spreading in the Central segment. In this paper, we tie sequence stratigraphic rift sequences to plate kinematic changes described in our new plate model. Attempts to consider the thermal and tectonic evolution of the Central Salt Basins of the South Atlantic as an analog for the Equatorial Margin may lead to wrong predictions in hydrocarbon exploration. The differences in the development of these segments may explain the asymmetry in the distribution of oil and gas reserves along the South Atlantic Margin. ■

Cretaceous Deformation of the Demerara and Guinea Plateaus During South Atlantic Opening

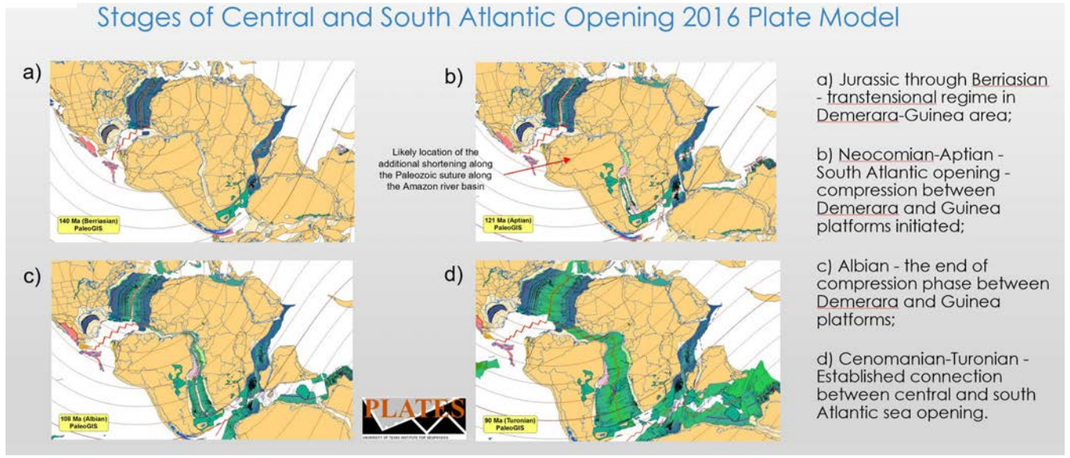
By Katya Casey, Marel Sanchez, Ana Krueger, and Ian Norton

The Demerara and Guinea Plateaus were part of the residual eastern part of the Gondwana land when they rifted from North America during the Middle Jurassic. Now, the Demerara Plateau is located in the northwest corner of the equatorial segment of the Atlantic Ocean. It rifted from the Guinea Plateau on the African margin during the Early Cretaceous opening of the Central Atlantic. An episode of Early Cretaceous compression predated the passive subsidence of the conjugate plateaus during the drift phase of the African and South American separation. Early Cretaceous compression produced a significant deformation of the southern edge of Guinea Plateau and the north–northeast edge of the Demerara Plateau. Our earlier plate tectonic modeling used rigid African and South America plates and have estimated at least 20–50 km of shortening on Demerara Plateau during Early Cretaceous. The Plateau It is topped by Albian unconformity, which according to our modeling, has removed up to 6 km of sediments from the Demerara Plateau.

In our previous work we focused both upon an Equatorial Transform Margin and the Demerara Plateau during Cretaceous Atlantic opening and questions on the nature of the deformation observed on the Demerara Plateau. Our most recent seismic interpretation of the pre-Albian deformation on the conjugate Guinea Plateau and the contemporary deformation observed in the Amazon Solimoes Basin allowed us to revise our rigid Plate model of 2014 further to account for a full shortening during Early Cretaceous compression between Demerara and Guinea Plateaus.

This work was previously presented at RiftsIII: Catching the wave conference and Africa conference in 2016. For our Rifts III presentation we added new interpretation of seismic and potential fields data on the Guinea Plateau complimentary to our earlier interpretation of Demerara Plateau and incorporate published interpretation from the Solimoes Basin into the plate model of South Atlantic opening. ■ **HGS Interantional Meeting** *continued on page 26*

HGS International Dinner continued from page 25



Biographical Sketches

Ana Krueger is a Geoscientist with 20 years of experience in Oil and Gas Exploration. She received a PhD from the University of Houston, an MSc from The Brazilian National Observatory and a BSc from Rio de Janeiro State University. Her research is driven by her interest in applying interactions of tectonics and sedimentation to understand and characterize the various aspects of conventional and unconventional Petroleum systems (reservoirs, source rocks, seals, migration and traps as well as mechanic stratigraphy). She is currently working in deep learning R&D at Bluware.

Katya Casey holds a Master of Science degree in Geophysics from University of Houston. Katya started her career with Russian Academy of Sciences in Moscow and continued it in United States where she worked for Amoco Petroleum, Vastar Resources, BHP Billiton, Apache and Murphy Oil companies. Currently, she is one of three managing directors at Actus Veritas Geoscience, LLC. She developed and applied new method of iterative interpretation of geophysical and regional subsurface data with plate tectonics reconstructions and integrating results into petroleum systems analysis. She is also known in the petroleum industry for designing and implementing multiple geoscience technologies and innovations including an early adoption of ArcGIS into oil and gas exploration workflows. She is adept at project definition and optimization of team dynamics. She also provides mentorship and develops early career geoscientists and colleagues through publications, training, teaching, and industry forum presentations. Katya is a respected technical speaker. She has coauthored papers and presented at industry conferences on upstream technologies, play-based exploration and the use of her findings from regional studies in value assessment of exploration blocks. She has received an award in "Leadership in Technology" from Association of Women in Computing and Honorary Membership Award from Geophysical Society of Houston.

Wednesday, February 27, 2019

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

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

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

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

W.C. Rusty Riese

Geologists, the Public, and Public Policy: What Are Our Ethical Responsibilities?

In the polarizing and supercharged environment of today's public discourse, many views are hotly contested, but three stand out as worthy of attention from geological scientists: fracking, public primary and secondary education, and climate change. All three are interconnected.

Fracking is widely condemned in the public media as a new technology whose safety hasn't been demonstrated and which should therefore be banned, as it has been in New York, and all this in spite of the fact that fracking has been carried out in Kansas since the 1920's, and more widely since the end of WWII – all tight gas plays have benefited from its application. Public K-through-12 education in science has been weak for many years, as evidenced by ever-declining scores on achievement tests, but has been further compromised in a number of states through the application of the Common Core State Standard Initiative and the Next Generation Science Standards (NGSS) – standards which appear less devoted to raising scientific awareness and skills than to promoting a political agenda.

The chimeric fantasy of controlling climate change is thus the avenue through which an assortment of political agenda are being promoted. Common Core and NGSS both recommend that educators identify global warming as a core concept and stress the relationship between global warming and human activity. This is a link which no scientific study has been able to demonstrate; and neither set of standards address the physics of heat, or the relationship between radiant heat and energy. They offer no appreciation of the role of the sun in affecting climate, or the relative impact of human contributions.

Why would educators and the federal bureaucracy which drives these initiatives take positions which clearly short-change the application of true quality science and in so doing diminish the scientific capabilities of the next generation? John Holdren, president Obama's science advisor answered that best:

> *"A massive campaign must be launched to…de-develop the United States…bringing our economic system (especially patterns of consumption) into line with the realities of ecology and the global resource situation…We must design a stable, low consumption economy in which there is a more equitable distribution of wealth."*

This "more equitable distribution of wealth" is envisioned to be global, as indicated by a UN IPCC spokesperson in the fall of 2015:

> *"One must free oneself from the illusion that international climate policy is environmental policy. This has nothing to do with environmental policy anymore. …We redistribute the world's wealth by climate policy."*

This is where geoscientists, indeed all scientists, must become involved. Our science is the study of the planet Earth, including all its materials, processes, and products; and the history of the planet and its life forms. We then have an ethical responsibility to place the knowledge thus obtained into the service of man. In this we have failed. We must become involved in shoring up the scientific foundations of the next generation by seeing that their curricula are robust in content. We must speak out about how hydraulic fracturing really works. We must shine a light on the criminal alteration of historical climate data by individuals who are charged with maintaining the integrity of those data and help the public understand what is really happening. None of this will be easy and some may be distinctly unpleasant, but without a robust engagement along these lines the "war on coal" will continue to metamorphose into a "war on all carbon fuels"; our access to many of the things which the "Great Enrichment" of the past two hundred years depended on and developed will be lost; and our very culture and way of life will be threatened. ■

Biographical Sketch

Dr. W.C. Rusty Riese is a geoscientist based in Houston, Texas. He is widely experienced having worked in both minerals and petroleum as a geologist, geochemist, and manager during more than 40 years in industry.

Rusty has written extensively and lectured on various topics in economic geology including biogeochemistry, isotope geochemistry, uranium ore deposits, sequence stratigraphy, and coalbed methane petroleum systems; and he holds numerous domestic and international patents. He also has more than forty years of teaching experience. He is a fellow in the Geological Society of America and the Society of Economic Geologists; and an Honorary Member of the American Association of Petroleum Geologists as well as several other professional organizations.

He earned his PhD from the University of New Mexico in 1980; his MS in geology from the same university in 1977; and his BS in geology from the New Mexico Institute of Mining and Technology in 1973. He is a Certified Petroleum Geologist.

Searching for Past HGS Publications

We are trying to compile a complete listing of HGS publications over the years, and include those we have not yet captured into the Datapages online database. For those not familiar with Datapages, it is an online database of images of worldwide geoscience publications, operated by the AAPG. Currently all the legacy HGS Bulletins are included, as well as the special publications listed below. The HGS benefits significantly from sales of these online publications.

So, we are looking for both references to, and copies of, any HGS publications we have not yet located. The floods of recent years have destroyed many of our stored publications we would have otherwise available.

If you are sorting out your library, or have digital copies of any recent HGS publications, please send this information to: editor.hgs@hgs.org. Many thanks. ■

HGS Special Publications Available on Datapages Archive Online Database

Disappointing Seismic Anomalies: Dry Hole Symposium #2, 2003

Deepwater Gulf of Mexico Dry Hole Seminar, 2000

Countdown to the 21st Century Houston Geological Society Technical Symposium, March 31, 1998

Environmental Geology and Genetic Sequence Analysis of the Trinity River Valley-Delta Region, Chambers and Liberty Counties, Texas, 1990

The Downdip Yegua: State of the Trend, 1989

Typical Oil and Gas Fields of Southeast Texas - Vol. 2, 1987

Field Seminar of the Big Bend, Trans-Pecos Region, Texas, 1986

Finding Deep Sands in the Gulf Coast Tertiary, 1984

Houston Area Environmental Geology: Surface Faulting, Ground Subsidence, Hazard Liability, 1981

Claiborne Sediments of the Brazos Valley, Southeast Texas, 1979

Lignite Resources in East-Central Texas, 1979

Oil Fields and Their Relation to Subsidence and Active Surface Faulting in the Houston Area, 1979

Stratigraphic Cross Sections of Southeast Texas, 1979

Damon Mound: Field Trip Guidebook, 1978

The Chenier Plain and Modern Coastal Environments, Southwestern Louisiana and Geomorphology of the Pleistocene Beaumont Trinity River Delta Plain, 1978

Geology of Alternate Energy Resources in the South-Central United States, 1977

Deltas: Models for Exploration, 1975

Structure, Stratigraphy and Petroleum Potential of the Northern Gulf of Mexico, 1974

Abnormal Subsurface Pressure: A Study Group Report, 1969-1971, 1971

Deltas of the World, Modern and Ancient: Bibliography, 1971

Holocene Geology of the Galveston Bay Area, 1969

Environments of Deposition, Wilcox Group: Field Trip Guidebook, Texas Gulf Coast, 1968

Deltas in Their Geologic Framework, 1966

Guidebook to the Geology of El Rancho Cima, Hays and Comal Counties, Texas: A Guidebook for Boy Scouts, 1963

Geology of the Gulf Coast and Central Texas, and Guidebook of Excursions, 1962

Typical Oil and Gas Fields of Southeast Texas, 1962

Geology of Houston and Vicinity, Texas, 1961

Jackson Group, Catahoula and Oakville Formations and Associated Structures of Northern Grimes County, Texas, 1960

Lower Tertiary and Upper Cretaceous of Brazos River Valley, Texas, 1959

The Frio Formation of the Upper Gulf Coast of Texas: Study Group Report, 1959

Upper and Middle Tertiary of Brazos River Valley, Texas, 1958

Stratigraphy of the Upper Gulf Coast of Texas, and Strike and Dip Cross Sections, Upper Gulf Coast of Texas, 1954

Boling Field, Fort Bend and Wharton Counties, Texas, 1953

Guidebook, Field Trip Routes, Oil Fields, Geology, 1953

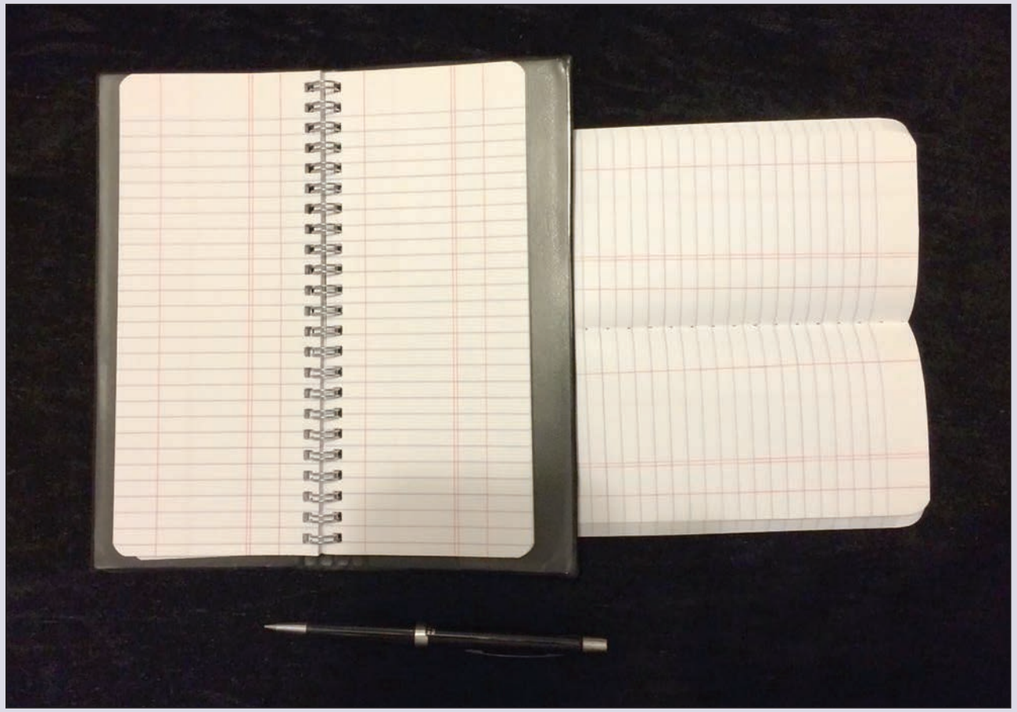
Composite Study Group Papers, Texas Gulf Coast, 1946 [Report of] Well Logging, 1947

An Introduction to Gulf Coast Oil Fields, 1941

Guide for Field Trips: AAPG 26th Annual Meeting, 1941

Study of the Wilcox Group, Texas, Louisiana, Mississippi, Alabama, 1940

Early Career Quiz



This is a recollection of useful tools no longer in common use. It is encouraged to ask a colleague to talk about this.

The winner of a HGS meeting registration is the first respondent to editor.hgs@hgs.org that:

1. Correctly names the items in the picture,

2. Explains their use, and

3. Has worked the fewest number of years and months as a professional geoscientist.

Send your answers to: editor.hgs@hgs.org. (It's not the pencil!) Have fun.

February 2019

GeoEvents

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Members Pre-registered Prices: Dinner Meetings members..... $40 Emeritus/Honorary members..... $40 Student members ..... $10 Nonmembers & walk-ups ..... $45 Except - Env. & Eng. ..... $30 Nonmembers & walk-ups ..... $35 Emeritus/Honorary members..... $15				1 **Don't wait, make your reservations online at hgs.org**	2
3	4	5 **HGS Board Meeting** *6 p.m.*	6	7	8	9
10	11 **HGS General Dinner Meeting** *"Scholarhip Night," Cindy Yeilding, Robert (Bobby Ryan), Charles Sternbach Page 20*	12	13 **HGS Environmental & Engineering Dinner Meeting** *"Overcoming Challenges for Successful Environmental Outcomes in Indonesia, Lessons for Work in Developing Countries," Brendan Brodie, Page 23*	14	15	16
17	18	19 **HGS Northsiders Luncheon Meeting** *"An Integrated View of the Petrology, Sedimentology, and Sequence Stratigraphy of the Wolfcamp Formation, Delaware Basin, Texas," Michelle Thompson, Jenn Pickering, Patricio Desjardins, Brian Driskill Page 24*	20	21	22	23
24	25 **HGS International Dinner Meeting** *"Influence of Proterozoic Heritage on the Development of Rift Segments in the Equatorial Atlantic," and "Cretaceous Deformation of the Demerara and Guinea Plateaus During South Atlantic Opening," Page 25*	26	27 **HGS General Luncheon Meeting** *"Geologists, the Public, and Public Policy: What Are Our Ethical Responsibilities?" W.C. Rusty Riese, Page 27*	28 **One Day Continuing Education Course** *"Acquiring High Whole Quality Core: Comprehensive Course That Will Cover All Aspects of The Core Acquisition & Analysis Process" Core Laboratories, Houston, Page 6*	**Reservations:** The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail office@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event**. If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**	

March 5 – 6, 2019
HGS Applied Geoscience Conference
Subsurface Intelligence and Analytics, Page 8

March 23 – 31, 2019
Explore the Solitario Flatirons with HGS Fieldtrip
Big Bend Ranch State Park, Page 4

May 19 – 22, 2019
AAPG 2019 Annual Convention & Exhibition
San Antonio, Texas, USA

July 22 – 24, 2019
Unconventional Resources Technology Conference (URTeC 2019)
Denver, Colorado

GCAGS 2019 Call for Talks and Posters Deadline March 4

By Linda Sternbach

The Gulf Coast Association of Geological Societies (GCAGS), partnering with GCSSEPM and the Houston Geological Society, are planning the 69th Annual Convention to be held October 23-25, 2019 at the Westchase Marriott hotel, on Briarcrest and Westheimer, in west Houston.

The Technical Committee has opened the Call for Papers, looking for oral presentations and poster presentations from the local Gulf Coast geoscience community on ten key themes. To submit a 300 word (maximum) abstract on a Gulf Coast topic, please visit the convention website https://2019.gcagshouston.com, and download the abstract form in Microsoft Word format. The abstract typed into the Word document can be emailed to Technical Chair Linda Sternbach at linda.sternbach@gcagshouston.com. The deadline is March 4 to submit a paper or poster abstract. Acceptance notices will be emailed March 25. Accepted presenters will have the opportunity to submit an expanded abstract (more than 300 words, and including figures) or full paper to the GCAGS Transactions, which is coordinated and edited by James Willis at james.willis@gcags.org.

GCAGS has a rich history of geoscience publications. Check out past GCAGS convention papers and abstracts available for download at https://www.gcags.org/exploreanddiscover/exploreanddiscover.html

Geoscience students are encouraged to submit one-panel posters to the technical program. Student posters can be on any topic, but professional talks and posters will be limited to onshore/offshore Gulf Coast and Mexico/Caribbean topics. There will be prizes at the convention for best student posters in several experience-level categories. Winning a poster prize is a great resume builder for young professionals!

The GCAGS planning committee includes Convention Chair - Mike Erpenbeck, Vice Chair - Larry Bartell, GCAGS President - Deborah Sacrey. The Technical Committee is Linda Sternbach, Chair; Vice Chair is Bob Wiener. Short Course Chair is J. Carl Fiduk, Field Trips co-chairs are Joel Saylor and Jinny Sission (U of H), Poster Chair is Sharon Cornelius (U of H), Judging Chairs are Sandy Rushworth and David Risch, Core Exhibits chair is Beverly DeJarnett (BEG). GCSSEPM convention planners include Tom Demchuk, Jory Pacht and Dorene West.

If HGS members would like to be session chairs, or coordinate programs during the convention please email Linda.sternbach@gcagshouston.com , or Deborah Sacrey at dsacrey@auburnenergy.com, or Mike Erpenbeck at mike.erpenbeck@hotmail.com. The short course and field trip committees will also need volunteers close to convention time in October 2019. ■

The ten themes for the GCAGS 2019 convention are:

1. Unconventional GOM Mudrocks and Shale Plays
2. Onshore GOM Conventional Plays – Discoveries and Case Studies
3. Offshore GOM Exploration and Production Studies
4. Over the Border: Mexico Geology and Exploration, Caribbean Exploration
5. Structural Geology, Gravity, and Magnetics.
6. Gulf Coast Environmental Geology.
7. Petroleum Engineers and Geologists Working Together for Better Answers
8. Seismic Technology and Salt Tectonics
9. Understanding Big Data and Computer Aided Interpretation
10. The Road to Business Success

Call for Abstracts:

"Exploring and Characterizing Deep-water Depositional Systems in the Gulf of Mexico and Beyond"

GCAGS Annual Convention – Houston, Texas, 23–25 October 2019

Deep-water petroleum reservoirs can present challenging E&P targets due to difficult operating conditions (often offshore & far from existing infrastructure), the proximity between reservoir intervals and seismic wave-refracting salt bodies, and complex stratigraphic architecture that juxtaposes heterogeneous sediment gravity flow deposits and interbedded mudstone intervals. Yet, given the right geologic conditions, these ancient deposits can be prolific petroleum systems and reward exploration programs that properly characterize and manage the geologic risk. Whether exploring in modern onshore, nearshore, or offshore environments, technological advancements have reinvigorated exploration of deep-water systems over the last decade—the Delaware and Midland basins provide one of the hottest drilling opportunities in recent times. This session explores 21st century challenges and solutions to characterizing ancient deep-water depositional systems, focusing on the geological risks and associated uncertainty pertaining to reservoir presence, quality, and performance – from new ventures to development.

We welcome abstracts in the following areas and more:

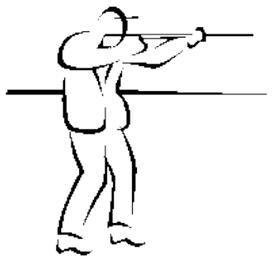
- Theme I: Basin analysis case studies from the Gulf States, Gulf of Mexico and Caribbean
- Theme II: Innovative concepts for reservoir characterization, sub-seismic interpretation, and value creation using outcrop and subsurface analogs
- Theme III: Applying source-to-sink concepts to reservoir presence and quality prediction – integration across the whole depositional system
- Theme IV: Deep-water carbonate plays and characterization
- Theme V: Enhancing deep-water exploration with artificial intelligence, machine learning and uncertainty analysis
- Theme VI: Emerging deep-water play concepts and future areas of exploration and development
- Theme VII: Investors view on resource plays throughout the Americas

Symposium Chairs: Jon Rotzien (Basin Dynamics), Tim Nicholson (Kosmos Energy)

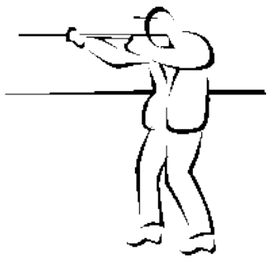
Committee Members: Paul Mann (University of Houston), Eugene Szymanski (Chevron), Darren Williams (California Resources Corporation), Keyu Liu (China University of Petroleum – Qingdao), Lothar Schulte (Schlumberger), Mason Dykstra (Anadarko), Anshuman Pradhan (Stanford University), Aram Derewetzky (Repsol)

For more information on the Symposium, please contact Jon Rotzien at:

Basin Dynamics, LLC
1875 Post Oak Park Drive #819
Houston, TX 77027
Email: Jon@BasinDynamics.com
Phone: +1 (650) 862-0574



HGS SKEET SHOOT



Saturday, June 8, 2019
Greater Houston Gun Club
6702 McHard Road, Missouri City

This tournament is a 50 target event. Shells are provided, however **you must bring eye and ear protection.** Greater Houston Gun Club and National Skeet Shooting Association safety rules will be in effect. Trophy winning shooters will be determined by the Lewis class system. Door prizes will be awarded by blind drawing after the conclusion of shooting. All competitors are automatically entered into the door prize drawing, but you must be present at the time of the drawing to win. BBQ lunch will be provided from 11:30 until 1:30. Refreshments will be available throughout the day. **Non-shooting guests are welcome to enjoy lunch and refreshments at a cost of $20 per guest.**

HGS recognizes that 2019 is a lean year in the oil patch, and sponsorship for events like this is hard to find. **For $150, you'll receive paid entry for one shooter and one guest (total value of $120) and be listed as a platinum sponsor on the webpage and at the event.**

We are limited to 160 shooters in four rotations. Entry fee is $90 per shooter for registrations received by FRIDAY, JUNE 1st. After June 1, registration will be strictly on a "space available" basis and the entry fee will be $120 per shooter. ***Register early!!***

For more information, contact: Andrea Peoples at (713) 463-9476 or office@hgs.org

For directions to the club, visit www.greaterhoustongunclub.com

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ONLINE REGISTRATION INFORMATION AT: https://www.hgs.org/civicrm/event/info?id=2078

To pay by check, mail this form with a check made out to HGS to:
Houston Geological Society, 14811 St. Mary's Lane, Ste. 250, Houston, TX 77079

To pay by credit card, please call the HGS office: (713) 463-9476.

Name: _____ Company: _____

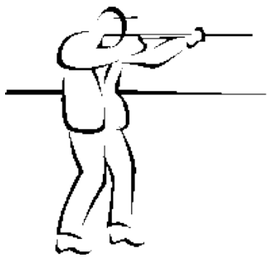
Email: _____ Phone: _____

Preferred time: (circle one) 9:00 10:00 11:00 12:00 Ammo: (circle one) 12 gauge 20 gauge

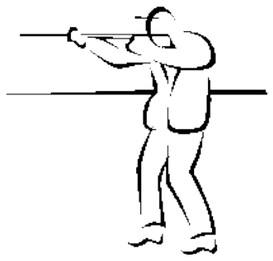
Entry Fees: $ _____ + Guest Fees: $_____ + Sponsor Contribution: $ _____ = Total: $_____

If you wish to register as a squad, please return forms for all squad members together.

ALL SHOOTERS WILL BE REQUIRED TO SIGN A DISCLAIMER OF RESPONSIBILTY BEFORE THEY WILL BE ALLOWED TO SHOOT!



HGS SKEET SHOOT



Saturday, June 8, 2019
Greater Houston Gun Club
6702 McHard Road, Missouri City

Sponsorship Form

AMMO BAG SPONSOR $1,000.00
Registration for a Team of 5
Company recognition on the HGS website, Bulletin and event
LUNCH SPONSOR $1,000.00
Registration for a Team of 5
Company recognition on the HGS website, Bulletin and event
BEVERAGE SPONSOR $750.00
Registration for a Team of 5
Company recognition on the HGS website, Bulletin and event
AMMO SPONSOR $750.00
Registration for a Team of 5
Company recognition on the HGS website, Bulletin and event
FIELD SPONSOR $750.00
Registration for a Team of 5
Company recognition on the HGS website, Bulletin and event
FLURRY SPONSOR $750.00
Registration for 2 team members
Company recognition on the HGS website, Bulletin and event
PLATIMUN WEBSITE SPONSOR $150.00
Registration for 1 shooter and 1 non-shooting guest
Company recognition on the HGS website, Bulletin and event

To pay by credit card, please complete the form and return to office@hgs.org or call 713-463-9476
To pay by check, mail this form with a check made out to HGS to:
Houston Geological Society, 14811 St. Mary's Lane, Ste. 250, Houston, TX 77079

Name: _____ Company: _____

Email: _____ Phone: _____

Sponsorship Level: _____ Amount: _____

Credit card # _____ Exp. Date: _____

For more information, contact: Andrea Peoples office@hgs.org
For directions to the club, visit www.greaterhoustongunclub.com

HGS Shrimp Peel & Crawfish Boil

Friday April 26, 2019
12:00 noon – 6:00pm

Bear Creek Pioneers Park, 3535 War Memorial Street, Houston, TX 77084
(Pavilion #6 is located off Bear Creek Drive)

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

Ticket Cost

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

Register online at WWW.HGS.org
www.hgs.org/shrimp_peel_2019

- **Sponsorship Opportunities**

Shrimp Sponsor $2000.00 - 6 Complimentary event tickets
Crawfish Sponsor $2000.00 - 6 Complimentary event tickets
Beer & Beverage Sponsor $1000.00 - 4 Complimentary event tickets
Live Music Sponsor $1000.00 - 4 Complimentary event tickets
Platinum Corporate Sponsor $1000.00 – 4 Complimentary tickets
Gold Corporate Sponsor $750.00 - 2 Complementary ticket
Silver Corporate Sponsor $500.00 - 1 Complementary ticket
Bronze Corporate Sponsor $250.00

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

Government Update

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

AGI Geoscience Policy Monthly Review (November 2018)

Senate Lawmakers Consider Series of Energy Bills

The Senate Energy and Natural Resources Subcommittee on Energy met on November 29, 2018 to consider a series of energy-themed bills as Congress begins look toward the next session. The hearing considered fourteen pieces of legislation, including bills to provide for the full operations of a fast neutron nuclear reactor by 2025 and to change access to the Strategic Petroleum Reserve.

Of the fourteen bills, S. 3618 is best poised to make gains before the end of the congressional session after having already been passed in the House. S. 3618, the Strategic Petroleum Reserve Reform Act, allows the Strategic Petroleum Reserve to be opened up to outside rentals from foreign governments and private industry.

The Strategic Petroleum Reserve (SPR) is an underground storage facility spread over four sites in Louisiana and Texas, each of which stores crude oil in excavated salt caverns for a maximum total storage capacity of 727 million barrels (10 percent of U.S. annual consumption).

The House already passed a similar bill on September 25, 2018, H.R. 6511, which would create a pilot program to lease underutilized storage facilities in the reserve to private entities. Under current policy, the Department of Energy (DOE) may only lease those facilities to foreign governments.

The subcommittee invited Representative Joe Barton (R-TX-6), who introduced H.R. 6511, to provide testimony on S. 3618. "It would be a good thing for the private sector to utilize the unused space and it would be a good thing for the people of the United States because the money that would be obtained from leasing, some of that money could be used to update or modernize the SPR," Barton said.

The subcommittee also considered a bill introduced by Energy and Natural Resources Chairwoman Lisa Murkowski (R-AK). On September 6, 2018 Senator Murkowski introduced S. 3422 to establish advanced nuclear reactor goals and provide for the full operations of a fast neutron reactor by 2025. The introduction of this bill coincided with President Donald Trump signing the Nuclear Energy Innovation Capabilities Act (NEICA) into law. NEICA, sponsored by Senator Mike Crapo (R-ID), encourages partnerships between DOE and private companies to develop new nuclear energy technologies.

Other bills considered in the hearing covered topics as varied as grid infrastructure, liquified natural gas permitting, energy conservation in federal buildings, and re-refining used lubricating oil. Congress now has until December 31, 2018 to pursue further action on the discussed bills before the end of the current session.

Administration Releases Second Decadal Report on Ocean Science and Technology

The National Science and Technology Council (NSTC) released a report this month entitled, "Science and Technology For America's Oceans: A Decadal Vision." The report outlines the Trump administration's goals to advance U.S. ocean science and technology in the coming decade.

The decadal vision identifies five main ocean priorities: (1) Understand the Ocean in the Earth System, (2) Promote Economic Prosperity, (3) Ensure Maritime Security, (4) Safeguard Human Health, and (5) Develop Resilient Coastal Communities. The report also identifies two cross-cutting topics that are relevant to all five goals: the modernization and management of ocean-related infrastructure and an educated, diverse, and dynamic "blue" workforce.

According to the report, carrying out those five priority research goals will require investments in and coordination of ocean science and technology across all levels of government and private industry, academia, and nongovernmental organizations over the long-term.

The report mentions the role of America's oceans, gulfs, rivers, and lakes in powering domestic and global commerce. "The ease of moving cargo and people beyond our coasts fuels the Nation's competitive advantage, advances trade, generates capital, and drives the domestic economy forward, in turn projecting strength abroad and safeguarding our national interests," the report says. "Similarly, the biological diversity and productivity of the ocean sustains the health of coastal communities and promotes a vibrant national economy."

The report also discusses ways in which ocean resources provide and create jobs, give mobility to U.S. armed forces, ensures national security, and provides opportunities for recreation.

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Government Update continued from page 39

The document builds on a number of initiatives outlined in the first national ocean research decadal plan released in 2007, entitled "Charting the Course for Ocean Science in the United States for the Next Decade." It acknowledges significant areas of growth over the last decade, including the advancement in novel ocean technologies, the establishment of coordinated observation networks, and the discovery of new marine life and ocean-derived therapeutics. The 2018 vision aims to advance those achievements. However, it highlights a need for balancing research to address immediate needs or areas of opportunity with long-term efforts to understand the fundamental ocean system.

National Climate Assessment Warns of Environmental Impacts and Societal and Economic Damages

The White House released the second volume of the U.S. Global Change Research Program's (USGCRP) Fourth National Climate Assessment (NCA4) on November 22, 2018 warning of potential damage to the U.S. economy, environment, and human health in the coming decades as a result of climate change.

The report finds that the impacts of climate change are already being felt in communities across the country. In the absence of significant global mitigation, annual losses in some economic sectors could consequently reach hundreds of billions of dollars by the end of the century.

The report includes information and projections regarding the negative impacts of climate change on different aspects of society and the economy. It suggests the growing impacts could disrupt the vitality of the nation's communities and lead to increased risks in other vital, interconnected systems including water resources, public health, agriculture, tourism, and national security.

According to the release, "Future climate change is expected to further disrupt many areas of life, exacerbating existing challenges to prosperity posed by aging and deteriorating infrastructure, stressed ecosystems, and economic inequality. Impacts within and across regions will not be distributed equally."

The report highlights adaptation strategies implemented in the energy sector—including replacing coal use with natural gas and increased deployment of renewable energy—along with policy actions that are reducing greenhouse gas emissions in the United States. However, it indicates that efforts must be expanded substantially to avoid the most severe, long-term consequences.

The National Climate Assessment was mandated by Congress in the Global Change Research Act of 1990, which requires the USGCRP to deliver a report every four years on the current trends and effects of global climate change. The first volume of NCA4 was released in November 2017.

The National Oceanic and Atmospheric Administration (NOAA) served as the administrative lead agency for the preparation of this report. The report's development was overseen by a steering committee, composed of representatives from thirteen federal agencies that participate in the USGCRP, and it was produced by a team of more than three hundred federal and non-federal experts. The authors evaluated scenarios that span a range of plausible changes in greenhouse gas emissions, and the report highlights some of the most decision-relevant uncertainties in key environmental parameters.

House Approves Reauthorization of National Geologic Mapping Act

The House of Representatives passed the National Geologic Mapping Act Reauthorization Act (H.R. 4033) on November 13, 2018 sending the bill to the Senate where it currently awaits further action. The act, introduced by Representative Doug Lamborn (R-CO-5), reauthorizes the National Geologic Mapping Program (NCGMP) through fiscal year 2023 and provides for the Associate Director for Core Science Systems to replace the Associate Director for Geology as the chairperson of the geologic mapping advisory committee.

Overseen by the U.S. Geological Survey (USGS), the program was established in 1992 to produce detailed geologic maps of the United States. These maps can be used for a variety of Earth science applications, such as land-use management, natural resource conservation, and mitigating the impacts of natural hazards. The NCGMP works with federal, state, and university partners to produce the maps, which are then added to the National Geologic Map Database, a collection of standardized geologic maps of the United States. The program was last reauthorized in 2009, but that authorization of its federal funding recently expired at the end of fiscal year 2018. H.R. 4033 would reauthorize the NCGMP at its 2005 level of $64 million per fiscal year through fiscal year 2023.

The reauthorization bill was first introduced in the Senate as S. 1787 by Senators Lisa Murkowski (R-AK) and Angus S. King Jr. (I-ME) on September 11, 2017. Representative Lamborn introduced H.R. 4033 with identical language in the House on October 12, 2017. Though the Senate Committee on Energy and Natural Resources has reported favorably on their version of the bill, the bill has not yet reached the Senate floor for a vote.

Senate Subcommittee Field Hearing Addresses Effects of PFAS Chemicals in Michigan

Senator Gary Peters (D-MI), ranking member of the Federal Spending Oversight and Emergency Management Subcommittee, convened a field hearing titled "Local, State and Federal Response to PFAS Contamination in Michigan" in his home state on November 13, 2018. The hearing focused on the emerging health and environmental impacts of per- and polyfluoroalkyl substances (PFAS).

PFAS are a group of manufactured chemicals used in a variety of industries around the world. They are found in a wide range of consumer products such as cookware, stain repellents, and firefighting foam. Although PFAS have been produced in consumer goods since the 1940s, certain PFAS chemicals are no longer manufactured in the United States as a result of phase-out programs.

According to the Environmental Protection Agency (EPA), exposure to PFAS can lead to adverse human health effects. EPA established drinking water health advisories for PFAS in 2016, which have led to a recent increase in state regulation and litigation to limit their usage.

The subcommittee hearing sought to highlight how exposure to PFAS chemicals impacts Michigan communities and to inform potential federal actions to support local efforts to address PFAS contamination. Senator Peters called for a nationwide, federal regulatory standard for PFAS chemicals.

The hearing featured testimony from several expert witnesses, including health officials, environmental specialists, and Michigan citizens.

Carol Isaacs, director of the Michigan PFAS Action Response Team (MPART), outlined in her testimony several of the steps MPART has taken to address the PFAS crisis since November 2017 to address issues of PFAS contamination in Michigan. These steps included establishing new clean-up criteria for groundwater used for drinking water and taking nearly six thousand test samples at thirty-four identified PFAS sites.

Isaacs echoed Peters' call for a federal regulatory standard for PFAS. "A national standard would allow uniform understanding of PFAS chemicals by all and would also assist in better understanding the use and disposal of the PFAS chemicals."

The hearing also featured testimony from a Michigan resident named Sandy Wynn-Stelt, whose husband died from liver cancer in 2016. The full health effects of PFAS on humans are not well understood, but some studies have indicated that PFAS exposure, especially over long periods of time, may have a variety of health effects, including on the liver and kidneys. A year later, Wynn-Stelt's water tested positive for PFAS contamination and her blood registered at 750 times the national average. "This is time [sic] when myself and my neighbors need our government representatives to stand up for us," Wynn-Stelt said.

This field hearing follows two related committee hearings held in the House and Senate in September. Prior to those hearings, Senator Peters cosponsored two bills that seek to address the PFAS crisis (S. 3382 and S. 3381), which were introduced by Senator Debbie Stabenow (D-MI) on August 23, 2018.

Senator Peters achieved a small victory in his fight to combat PFAS contamination after he successfully included a provision in legislation to reauthorize the Federal Aviation Administration (FAA) that was signed into law last month. The provision introduced by Peters gives commercial airports the option to discontinue the use of firefighting foams that contain PFAS. ■

HGS Welcomes New Members

New Members Effective January 2019

ACTIVE MEMBERS	STUDENT MEMBERS
Bill Maloney	Kennetch Castro
Sara Fuller	Efren Mendez
Don Griffin	
Nicholas Ayre	

Welcome New Members

Remembrance

John Lawrence Boone
1950-2019

John Lawrence Boone was born in Charleston, South Carolina in 1950 and died of metastatic prostate cancer* on Wednesday, January 9, 2019 at his home in Houston. He earned a BS degree in 1973 and a MA degrees in geology in 1975 from the University of Texas, which led to careers in petroleum geology and hydrogeology. His keen mind led him to constantly read about discoveries and theories about the Earth's formation, its secrets, its resources, and the geology of places beyond Earth.

After graduation, his oil and gas career began at Getty Oil Company in Houston. He relocated to Corpus Christi where he worked for TXO Production Co., Tondu Corporation, and Everest Minerals. In 1986, the price of oil fell from around $30 per barrel to $10 per barrel. At this point, John changed the focus of his career to hydrogeological and environmental assessment at Conoco, Inc. GSI, RMT, ERM and Arcadis U.S., Inc. He was a past member of the American Association of Petroleum Geologists, the Corpus Christi Geological Society, the Houston Geological Society and the National Groundwater Association. John joined HGS in 1994.

He was passionate about history – from the Greeks and Romans to the Franco Prussian wars to World War II to Vietnam to today's tumultuous climate. He understood history and put it into the context of today's events. John was a man of many talents and interests. He piloted his V-tailed Bonanza, sailed, rode horses, bicycles and motorcycles, played classical guitar, ran, skied, wind-surfed, kayaked, canoed, hiked, worked out, played tennis and was an all-around handy man. John was a voracious reader of autobiographies, military history and history in general, politics, finance and geology books and publications. For many years, he and his wife, Marta, regularly attended performances presented by Chamber Music Houston, as well as those by the Houston Symphony and Austin Classical Guitar Society.

He is survived by his wife of 33 years, Marta and their daughter and son.

*Marta has a final request:
"Men, please have your PSA level checked regularly, for your and your family's sake."

This Remembrance was summarized from a very extensive Life Tributes, published in *Houston Chronicle* on Jan. 27, 2019

Remembrance

Arch Helton
1928-2019

Arch Wesley Helton was born in 1928 and died on January 27, 2019.

Arch graduated from the University of Houston in 1957 with a degree in Geology. He was a member of the Houston Geological Society and the Houston Association of Professional Landmen. He founded and operated two successful companies for over 50 years. He was known for his sense of humor and love of life. He enjoyed fishing, gardening and especially growing orchids. He is survived by his wife of 62 years Antoinette, their two children and three grandchildren.

Summarized from Life Tributes published in *Houston Chronicle* on Jan. 30, 2019

Remembrance

William "Bill" Donald Poynor
1931-2018

Bill was born June 23, 1931 in Weatherford, Texas. From the time he was a kid he had an interest in show business. While first attending Texas Christian University, he enjoyed performing with a friend in a duet act. He continued singing, mainly for weddings and church solos. He eventually pursued a major in his favorite subject, geology. Bill attended UCLA and received a BS degree in geology in 1957 and a MA in geology in 1960. He worked 13 years as a geologist for Atlantic Richfield in Los Angeles from which he moved to Houston. Beginning in 1973 and for a decade Bill worked for Anadarko Petroleum Company where he headed Anadarko's offshore division from its inception. From 1983 to 1996 he served in an executive capacity for companies including Mesa Petroleum Corporation, Hunt Oil Company, Sandefer Offshore Company and Midcon Offshore. As a 39-year veteran in the petroleum exploration and production industry, the Offshore Gulf of Mexico was his principal focus, with other areas of expertise including Gulf Coast Onshore, California, Alaska and the Rocky Mountains. Bill joined HGS in 2008.

He is survived by his wife of 63 years, Nancy, and their three children and spouses.

This Remembrance was summarized from the Life Tribute section in the January 27, 2019 *Houston Chronicle*.

Remembrance

Remembrance

Peter Cornay Smith
1928-2019

Peter Cornay Smith was born in New Orleans, Louisiana on June 6, 1928, and died on Wednesday, January 9, 2019.

He received his undergraduate degree in Geology from Tulane University in 1949 and a Master's in Geology from LSU in 1952. Peter spent his entire 33-year career with one company, Stanolind, which later became Pan American Petroleum, and thereafter Amoco (now BP). He began his career in New Orleans in 1953, as a Gulf Coast Geologist. In 1958, Peter relocated to Houston, where he spent the rest of his career. Peter joined HGS in 1959.

Pete is survived by his wife of 67 years, Hathaway "Frances", and his five children and their families.

Published in *Houston Chronicle* on Jan. 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 Black & White Prices Shown – Color add 30% to prices below					**Specific Page Color Ad Placement**					
No. of Issues	Random Eighth Page	Random Quarter Page	Random Half Page	Random Full Page	Inside Front Cover Full Page	Inside Back Cover Full Page	Page 2 Full Page	Outside Back Cover Half Page	Back of Calendar Full Page	Calendar Quarter Page
10	$950	$1,350	$2,550	$4,750	$8,000	$7,500	$7,050	$6,850	$6,650	$3,000
9	$800	$1,300	$2,500	$4,700						
8	$750	$1,250	$2,250	$4,300						
7	$600	$1,100	$2,200	$3,850						
6	$550	$950	$1,800	$3,500						$2,000
5	$500	$800	$1,600	$3,000	$4,700	$4,500	$4,350	$4,000		
4	$450	$650	$1,300	$2,500						
3	$300	$550	$950	$2,000						$1,000
2	$250	$400	$700	$1,500						
1	$150	$250	$450	$1,000	$1,500	$1,400	$1,250	$1,000	$1,250	$850
Professional Directory Section Business Card Ad: 10 Issues – $160 ($30 for each additional name on same card)										

Website Advertising Opportunities

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

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

Application to Become a Member of the Houston Geological Society

Qualifications for Active Membership

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

Qualifications for Associate Membership (including students)

1) Be involved in the application of the earth or allied sciences.
2) Be a full-time student enrolled in geology or in the related sciences.

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

Annual Dues Expire Each June 30. (Late renewals – $5 re-instatement fee)

Annual dues are $30.00; emeritus members pay $15.00; students are free.

Mail this application and payment to:

Houston Geological Society

14811 St. Mary's Lane, Suite 250 • Houston, TX 77079-2916

Telephone: 713-463-9476 Fax: 281-679-5504

Payment method:

❑ Check, ❑ VISA, ❑ MasterCard, ❑ American Express, ❑ Discover

Card # _____

Expiration Date: _____ Card I.D. _____

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

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

Name: _____

Address: _____

_____

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

Email: _____

Job Title: _____

Company: _____

Company Address: _____

_____

Work Phone: _____ ***Fax Number:*** _____

Circle Preferred Mailing Address: Home Office

Professional Affiliations: _____

❑ AAPG member No.: _____

Professional Interest:

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

❑ International E&P ❑ Gulf Coast E&P (onshore & offshore)

School _____

Degree _____ ***Major*** _____ ***Year*** _____

School _____

Degree _____ ***Major*** _____ ***Year*** _____

Earth Science Work Experience _____

_____

_____

_____

Applicant's Signature _____ ***Date*** _____

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

Name: _____

Signature _____ ***Date*** _____

Membership Chairman _____ ***HGS Secretary*** _____

revised 5/02/17

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