Volume 61, Number 4

HGS Bulletin

Houston Geological Society

December 2018

The Future of Artificial Intelligence (AI) Applications in Geology

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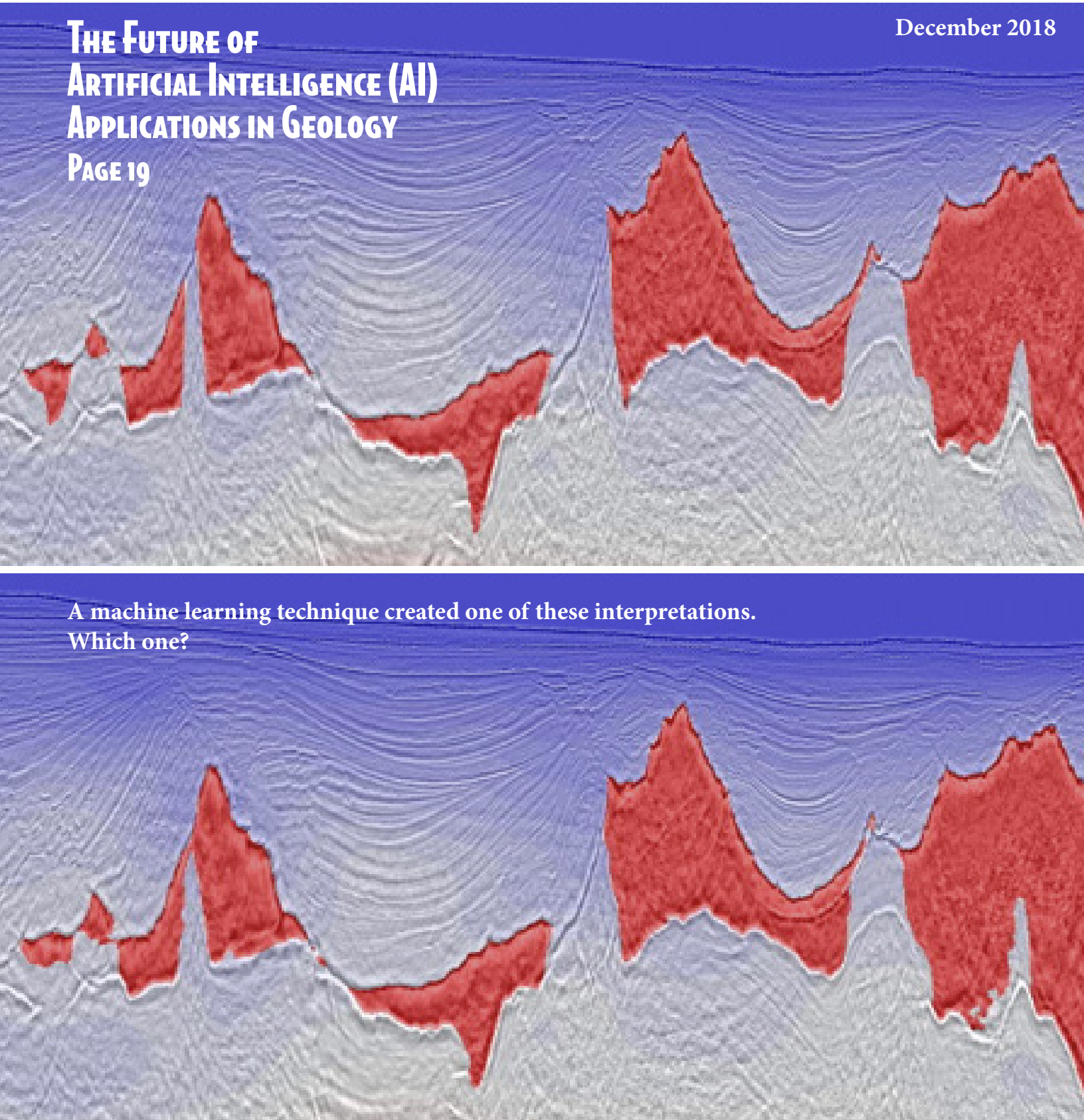

A machine learning technique created one of these interpretations.
Which one?

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Houston Geological Society

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In Every Issue

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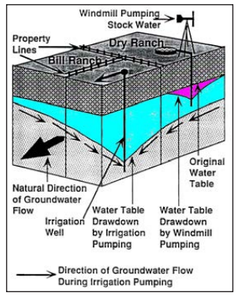
Technical Meetings

Other Features



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About the Cover: It is a single extract of preliminary seismic data from a large 3D survey. One of the images was created by a team of interpreters who worked for weeks developing the interpretation. The other image was generated completely by a machine that had been taught to interpret salt. The machine learning interpretation took a couple of hours.

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69th Annual Gulf Coast Association of Geological Societies 2019 GCAGS Convention

October 23-25, Marriott Westchase, Houston

Hosted by the Houston Geological Society and the GCSSEPM

General Chair: Mike Erpenbeck, Vice Chair: Larry Bartell, GCAGS President: Deborah Sacrey

Submit an Oral or Poster Abstract by March 4, 2019

Convention Themes

1. **Unconventional GOM Mudrocks and Shale Plays**
   Austin Chalk, Eagle Ford, Haynesville, Eaglebine and other plays
2. **Onshore GOM Conventional Plays, Discoveries, and Case Studies**
   Louisiana and Texas Wilcox, Miocene, Yegua, and other trends
3. **Offshore GOM Exploration and Production Studies**
   Cretaceous, Miocene, Deepwater Wilcox Plays, Risking, and Dry Hole Evaluation
4. **Over the Border: Mexico Geology and Exploration, and Caribbean Exploration**
   Mexico, Cuba, Belize, Trinidad, Offshore Central America, Regional Studies
5. **Structural Geology, Gravity, and Magnetic Case Studies**
   Ground Penetrating Radar Imaging, Use of Drones, and Lidar Imaging
6. **Gulf Coast Environmental Geology**
   Subsidence & Flooding Impact, Groundwater Quality, Public Education Outreach, Environmental Studies, and Professional Licensing
7. **Petroleum Engineers and Geologists Working Together for a Better Answer**
   Estimating Reserves, GeoModeling, Economics, Waterflooding, and Permeability Enhancement
8. **Seismic Technology and Salt Tectonics**
   Depth Migration, Subsalt Processing, AVO, Seismic Attributes, and Shallow Hazards
9. **Understanding Big Data and Computer Aided Interpretation**
   Machine Learning, Visualization, Augmented Intelligence, and Pattern Recognition
10. **The Road to Business Success**
    Deals, Financing, Starting Own Company, Young Professional Careers, and Consulting

2019 Convention Oral and Poster abstracts of up to 300 words must be submitted to the Technical Chair, Linda Sternbach, by March 4, 2019. Send abstract and contact info in a Word document to linda.sternbach@gcagshouston.com. Authors will receive notification of acceptance by March 25, 2019

If you'd like to publish in the *GCAGS Journal*, the peer-reviewed journal of Gulf Coast geoscience, submit an extended abstract of at least 600 words, including 1–2 representative figures, to the *GCAGS Journal* Editor, Robert Merrill (rmerrill@catheart.com) by December 15, 2018.

www.gcagshouston.com

Cheryl Desforges
President@HGS.org

HGS Jammin'Geos

In general, Geoscientists are known to have a higher propensity to be creative than the general population. Clearly, it helps us in our jobs to be able to think three dimensionally and draw figures. But creativity comes in many forms. One is musical ability and creativity. HGS wants to tap into our member's musical ability and creativity. So, we are calling all musical geos to step forward!

This is the official call to service to be a HGS Jammin' Geo. If you individually play an instrument, or if you're part of a musical group, we want your musical talent to debut at our annual Spring Shrimp Peel!

You might be wondering how I got this idea. Recently I was having coffee with **Bill DeMis**. We were discussing participation in professional organizations. We both agreed it is important for networking and ultimately important to every geologist's professional development. So, the discussion turned to how we can relay that message to our colleagues. We decided that in order to attract more participation, we could make our events more fun. Bill pulled out his cell phone and showed me a picture of the AAPG Jammin' Geos at the recent Salt Lake City Convention. He said it was a very fun event with lots of people in attendance. He referred me to Rick Fritz, former AAPG Executive Director, for more details. So I started down the path to Rick to find out how the group started and how it functions. He said it was an organic idea that started in hotel rooms at annual conventions, then moved to larger rooms at the venue when there were too many attendees to fit into one hotel room. All the events are free, but there's a cash bar for attendees. Over the years Rick added a song book after he discovered that at the 1921 Annual AAPG Convention the attendees would often break out in song – always geology related songs. He said there is no need for the per formers to rehearse ahead of time, since each artist or group of artists play songs familiar to them. He hooked me with the idea that we needed to bring music back to HGS events by talented members displaying their musical talent.

This is the official call to service to be a HGS Jammin' Geo.

When Bill and I were talking, we lamented that we remembered a time when we were the "newbies" and the typical HGS monthly meeting had much higher attendance than today, and the social events were so popular that attendees were almost shoulder to shoulder. The annual Shrimp Peels during the late 1970s were cases in point. If you were a geo or a friend of a geo in Houston, you didn't want to miss them. Of course there was networking and many new people to meet, but there was also a lot of fun listening to a band and dancing - mostly line dancing. Those were the days the Shrimp Peel was on the north side of town at the old Knight's of Columbus Hall, which we eventually outgrew. Over the years the Shrimp Peel waned, and there were a few years that we didn't have one. But now the annual Shrimp Peel has returned and we want to make them even more fun with Jammin' Geos providing some of the entertainment! With over 3300 members, I suspect there are quite a few talented musical geos. All it takes to join is to express an interest by adding your name to a list of interested parties. The HGS Office will keep the list, so please share your contact information and desire to participate by either calling (713-463-9476) or emailing (Office@HGS.org) the office. The list will be used for communicating information and getting ideas, such as which songs to include in the song book. Of course, this spring you will need to show up at the Annual Shrimp Peel with your instrument, as well as with your group, if you're in one.

Big Deal Alert: The HGS YouTube Channel (**HGSGeoEducation**) was identified by Feedspot as one of the Top 15 Geology YouTube Channels on the web. The award was shared online via the Feedspot blog (https://blog.feedspot.com/geology_youtube_channels/) and via email to hgs.socialmedia@gmail.com on November 30, 2019, by the Founder of Feedspot, Anuj Agarwal. The HGS is listed as #8 out of 15, with the AGU and British Geological Survey holding spots 1 and 2, respectively. Rankings were based on criteria including total subscribers, views, and uploads, quality and consistency of videos, YouTube search ranking, and the Feedspot editorial teams' review. The list is a fantastic compilation of geological YouTube channels, and it is an honor for the HGS to be included among such good company. ***Congratulations to Linda and all those involved with capturing, preparing, and sharing the videos that the HGS is able to post.*** Be on the lookout for the digital graphic of the award that Feedspot provided to display.

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

SPONSORSHIP FORM

All event profits benefit the HGS Scholarship Funds.

Corporate Platinum Sponsor - $10,000
- Dedicated table with company logo
- 10 complimentary dinner registrations
- Drink Tickets for Icebreaker reception
- Formal recognition at event
- Company name & logo listed as sponsor on online registration page and in related HGS articles

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Individual Sponsor - $500
- 1 Complimentary dinner registration
- Drink Tickets for Icebreaker reception
- Formal recognition at event

Corporate Gold Sponsor - $5,000
- 6 complimentary dinner registrations
- Drink Tickets for Icebreaker reception
- Formal recognition at event
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Please submit company logo along with form and payment. Payment by credit card or check. Please make checks payable to *Houston Geological Society*. Email form to office@hgs.org.

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Jim Tucker
editor.hgs@hgs.org

Getting Involved

We have recently seen the benefits of getting involved in matters not generally in the range of our technical tasks . The excitement and potential trauma of the possible elimination of the Texas Board of Professional Geoscientists (TBPG) by scheduled sunsetting caused mobilization of several geoscience organizations within the state to counter board elimination. While we often focus on the same occupational tasks over and over, because it is what we like and are good at, the speed that concerned geoscientists mobilized last summer to inform the Texas Sunset Advisory Commission of the significance of licensing of geoscientists in Texas and the importance to the public. Videos of this committee's meetings and live feeds of upcoming meetings are at: https://www.sunset.texas.gov/meetings. The next meeting in Austin is December 12-13, if you want to see this board in action.

The mobilization to inform this commission has resulted in the establishment of the Texas Geoscience Council (TGC, information at: https://www.txgeoscience.org), representing petroleum, water resource, engineering, soil science, and environmental geoscientists. Several HGS Members are on its board, and the HGS has contributed funds for its founding. Many HGS Members may not think about licensing in their day-to-day activities, but it is important to geoscientists dealing with public safety and health matters, and licensing is required to sign some reports.

The TBPG does regular oversight of licensees, and I have heard of licensees having their continuing education qualifications audited, and once got a call when I had forgotten to renew during a move, and had listed my Texas license on my LinkedIn page. Easily corrected, but I have never had this sort of diligence from the boards overseeing my California geologist license where I have paid licensing fees over the last thirty years. Plus, the TBPG reduces the licensing fee by 50% after you reach the age of 65.

The effectiveness of the group's activities was noticed by the AAPG and AIPG and Texas AIPG Members received the following letter:

> *This morning, the Texas Sunset Advisory Commission reached a decision to retain the Texas Board of Professional Geoscientists and to retain Professional Geologist Registration in Texas. The Commission determined that a Sunset Review of the TBPG will occur in 6 years, coincident with the review of the Professional Engineer Board of Registration.*
>
> *In addition, the Commission has recommended other changes TBPG policies.*
>
> *I wanted to extend a thank you to all who commented and participated in the review process, and to recognize the hard work of the Texas Section of AIPG, as well as the work of AEG, the Houston and Austin Geological Societies, ASBOG, and the numerous others who gave voice to their concerns and shared their expert opinions.*
>
> *If I failed to mention a specific professional group, please accept my apologies and feel free to share the proper thank you's to the individuals and societies that worked to insure that Professional Geologists Registration continues in Texas.*
>
> *With best regards,*
> *Aaron W. Johnson, Ph.D.*
> *Executive Director*
> *American Institute of Professional Geologists*
> *1333 W. 120th Avenue*
> *Westminster, CO 80234*
> *(letter reprinted by permission)*

The decision to sunset the TBPG lies with the Legislature during their upcoming session in 2019. The TGC is preparing an informational document that will be provided to all legislators in Austin in 2019. We will let HGS Members know when it is available if they want to meet their legislators in their home districts, which I encourage, as the legislative session is busy. You can find your state Senator and Representative at: https://fyi.capitol.texas.gov/Home.aspx. I occasionally speak at the Tuesday afternoon Houston City Council public sessions, and we all can participate as our lives allow.

Along the communications line, I recently saw this definition in my *GeoWord of the Day* email:

> **geologese** (ge-ol"-o-gese') (a) Literary style or jargon peculiar to geologists. (b) Geological language that is "progressing rapidly" toward the construction of "sentences in such a way that their meaning is not apparent on first reading" (Vanserg, 1952, p.221).

So, avoid the jargon we use daily to facilitate our communication with colleagues when you are talking to legislators and others. (If you want to receive the GeoWord daily, contact: http://www.agiweb.org/word/ .)

Have a safe month and volunteer for something. ■

The Houston Geological Society Continuing Education Committee Presents

Groundwater Hydrogeology

A Two-Day Short Course

by Dr. Christopher C. Mathewson, Regents Professor Emeritus, TAMU
Senior Training Specialist, TEEX

Monday-Tuesday, January 21-22, 2019 • 8 am

Pricing
$250.00

NO WALK-UPS ACCEPTED

Seating is limited to 49.

Registration: by January 15, 2019 or until the maximum registration of 49 attendees is reached.

Includes: Notebook, **Continuing Education Certificate–16 CEU**, Networking Lunch, Continental Breakfast, Coffee and Break refreshments.

This course is a fund-raiser for the Texas Geoscience Council, the state-wide umbrella coalition of geoscientific firms, professional organizations, and independent geoscientists, established on August 18, 2018 to "support the protection of the health, safety and welfare of all Texans through public education about geoscientific work and advocacy for professional geoscientist licensure in the Lone Star State.

Advisian
WorleyParsons Group

INTECSEA
WorleyParsons Group

Date: Monday-Tueday, January 21-22, 2019 • 8:00 am (Doors open at 7:00 am)
Location: WorleyParson, Suite 100, Energy Center II
575 North Dairy Ashford Road, Houston, Texas 77079
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

Course Description

This course exposes participants to the geological aspects of groundwater studies and relates the geology to practical aspects of groundwater investigations to develop basic problem solving and interpretative skills needed in the protection of human health and well-being. The curriculum consists of:

1. an introduction to the geology of groundwater systems and to the interpretation of the three-dimensional characterization of an aquifer system,
2. a discussion and hands-on exposure to techniques used in groundwater investigations,
3. techniques used in the characterization of groundwater systems
4. a discussion and demonstration of various well drilling and completion methods, and
5. an introduction to groundwater sampling and contaminant transport, with an emphasis on human induced errors in contamination evaluations.

Participants will gain hands-on exposure to groundwater hydrogeology theory and practice and the opportunity to learn about hydrogeological assumptions and errors that potentially impact public health, safety and well-being. Particular attention is given to the development of basic knowledge skills needed to evaluate and interpret groundwater systems and to assess human induced errors and complications in the interpretation and analysis process.

Course Objectives

The course objective is designed to present the basic geologic and porous media flow theory and concepts such that the participant can apply this information to the interpretation and analysis of groundwater systems. The course emphasizes the practical application of the theory and concepts of groundwater hydrogeology to the protection of the public health, safety and well-being. The teaching methods achieve this objective through hands-on activities throughout the course.

Topics Covered

- Course Administration and Introduction
- Hydrologic Cycle: Module 02
- Groundwater Systems: Module 03
- Groundwater Exploration: Module 04
- Environmental Drilling: Module 05
- Water/Monitor Well Design: Module 06
- Well Development and Testing: Module 07

Learning Objectives

Hydrologic Cycle

At the completion of the module, students will be able to 1) describe and understand the hydrologic cycle, 2) describe and understand moisture balance, 3) discuss severe meteorological processes and 4) Relate water rights

Groundwater Systems

At the completion of the module, students will be able to 1) define and recognize aquifer types, 2) understand and use environment of aquifer formation, and 3) relate geologic setting to predict aquifer characteristics

Groundwater Exploration

The educational objectives of this module are to introduce the student to groundwater exploration technologies and methods, including: 1) design and plan exploration and field operations, 2) apply aerial photography and photogrammetric techniques, 3) understand and apply various image analysis techniques and 4) use and assess geophysical investigation techniques

Environmental Drilling

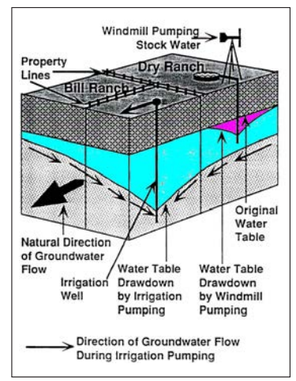
Students will learn about the various drilling techniques and their advantages and disadvantages in this module including the ability to 1) define the advantages and disadvantages of various drilling techniques and 2) evaluate drilling problems and operational safety

Water/Monitor Well Design

At the completion of the module, students will be able to 1) define the design parameters for various well purposes and uses, 2) estimate well performance and 3) assess design factors affecting well performance

Well Development and Testing

At the completion of the module, students will be able to 1) evaluate the degree of development of a well, 2) evaluate monitor/production well design and development techniques and 3) analyze external factors affecting well performance and aquifer test results



Target Audience

Geologists, geophysicists, and engineers preparing for initial licensing examination and experienced professionals wanting a review. This is a fundamental course particularly well suited as preparation for the ASBOG Hydrology Domain Exam.

Biographical Sketch

Christopher C. Mathewson has specialized in Engineering Geology at Texas A&M University, College Station, Texas since 1971. Professor Mathewson received a Bachelor of Science degree in Civil Engineering from Case Institute of Technology in Cleveland, Ohio, in 1963; and his Master of Science and Doctoral degrees in Geological Engineering from the University of Arizona in 1965 and 1971. Dr. Mathewson served as a commissioned officer in the National Ocean Survey from 1965 to 1970, working on ocean charting and marine geophysical surveys in the Pacific and on coastal hazards in Hawaii. At Texas A&M, he has carried out research on coastal and river processes, expansive soils, urban planning, surficial processes, groundwater resources and protection, natural hazard analyses and mitigation, archaeological site preservation and engineering geology of surface lignite mines.

He has presented over 400 papers, published over 90 technical papers, edited 4 technical volumes and is the author of a textbook in Engineering Geology. In addition, he is active in the profession, having served as President of the American Geoscience Institute – President of the Association of Environmental and Engineering Geologists – Chair of the Engineering Geology Division, Geological Society of America –Chair of the U.S. National Group, International Association of Engineering Geology, and the Environment, among many other society positions. Governor Perry appointed him to the Texas State Board of Professional Geoscientists in 2012. He has served on the Council of Examiners of the National Association of State Boards of Geology where he assists in the writing and review of the national Geologist Licensure Examination since 1992.

He has received many awards, including: the Faculty Distinguished Achievement Award in Teaching and the Robert C. Runnels Excellence in Advising Award from Texas A&M University – the Claire P. Holdredge Award, the Floyd T. Johnston Service Award, and the Karl and Ruth Terzaghi Outstanding Mentor Award from the Association of Environmental and Engineering Geologists and the Meritorious Service Award from the Engineering Geology Division of the Geological Society of America.

GULF COAST ASSOCIATION OF GEOLOGICAL SOCIETIES

CALL FOR PAPERS
for the
GCAGS JOURNAL

The peer-reviewed journal for Gulf Coast geoscience.

GCAGS JOURNAL

Open Access • Fast Track • No Page Charges

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).

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

FIRST ANNOUNCEMENT

Houston Geological Society
2019 Applied Geoscience Conference
1st "Subsurface Intelligence and Analytics" Conference

Call for Content Papers

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

HGS Technical Committee
Rebecca Morgan, Co-Chair
Jason Simmons, Co-Chair
With Subsurface Digital Industry Experts

Deadline for Submission: Nov. **16th 2018**

Sponsors:

BAKER HUGHES a GE company · Anadarko Petroleum Corporation · TGS · devon · IHS Markit

https://www.hgs.org/

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- hype or hope? 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, data storage, the changing workforce and digital transformation of the Geoscience disciplines. 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

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

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

Theme & Schedule	Main Topic	Topic Focus Areas
Opening	Opening and Keynote Address Session	
Theme 1	**Digital Transformation – The Changing Workforce**	This theme focuses on the digital workforce and the skill sets needed for transformation. The session could be also open to HR professionals and will allow **technical discussion on the necessary skills and competency for Digital Transformation and the fears around workforce replacement.**
Theme 2	**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?**
Theme 3	**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.**
Theme 4	**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?**
Theme 5	**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.**
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** . Abstracts submission deadline is **Friday, 16th November 2018**.

Important Dates

Registration open	31st August 2018 31st
Early bird deadline	December 2018 25th
Registration deadline	February 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

Sponsorship

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
1st "Subsurface Intelligence and Analytics" Conference

Guidelines For Abstract Submission

Please submit your abstract for either an oral presentation by sending it, as an email attachment to AGC2019@hgs.org . Submissions should be sent as soon as possible and no later than November 16th 2018.

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

- **Digital Transformation - The Changing Workforce**
- **Machine Learning and Data Analytics in Exploration and Production**
- **Automation – Reliability and Productivity**
- **Leveraging Cloud and Machine Learning to Transform Seismic and Geoscience Data Use**
- **Digital Transformation of the Geosciences – Hype or Hope**

Abstracts should be:

- Length should be 1 page (8½" x 11"), no more than 300 words, and may include diagrams in color or black and white, and references.
- Submit as MS Word documents with embedded graphics.
- Each file name should include the principle author's surname.
- Include contact information (email address) for the principle author in the abstract
- Indicate the speaker with an asterisk (*) after their name in the author list.

The principle author of submitted abstracts will be notified of the committee's decision no later than **December 14th 2018.**

Accepted Submissions

Each author of an accepted submission is requested to submit an EXTENDED ABSTRACT for their oral presentation by January 14th 2019.

The extended abstract may contain references, appendices, figures and maps. Please indicate if you **do NOT** wish this to be part of proceedings of the event.

2019 Applied Geoscience Conference

March 5-6, 2019

Sponsorship Opportunities

Brand your company with the premier event designed for integrated asset teams. To sponsor, please contact Thomas Reed at thomasreed979@gmail.com or Andrea Peoples at **andrea@hgs.org** or **713.463.9476**

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Advertisement in Program Book	Full Page	1/2 Page	1/4 Page	1/8 Page	
Complimentary Full Registrations	4	3	2	1	
Complimentary Vendor Booth	✔	✔	✔		
Recognition by HGS in Program Book, onsite signage, post show highlights and thank you in HGS Bulletin	✔	✔	✔	✔	✔
Recognition in Conference Announcements and Website (logo with hyperlink)	✔	✔	✔	✔	✔

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

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

2019 Applied Geoscience Conference

March 5-6, 2019

1st Subsurface Intelligence and Analytics Conference

To sponsor, please indicate your sponsorship level _____ with payment (payable to HGS) to:

HGS, 14811 St. Mary's Lane, Ste. #250, Houston, Texas 77079, Attn: Andrea Peoples.
You may also email your completed sponsorship form to **andrea@hgs.org**.

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Anadarko

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

For more information please visit: www.hgs.org

Monday, December 10, 2018

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

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

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

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

Edward R. Jones, PhD
Academic Director of
MS Analytics Program
Texas A&M University

The Future of Artificial Intelligence (AI) Applications in Geology

The science of geology has a long history. It forms the basis for traditional geological metrics, such as predicting oil production from shale wells from geologic and completion rate parameters. In the past, calculations were driven from first-order geological principles developed using physical models. In some cases, these relationships were developed from established linear regression models.

Nowadays geologists are learning to make use of more advanced techniques originally developed for Artificial Intelligence applications, and now modified for solving geological and petroleum problems. These include cluster analysis, artificial neural networks, decision trees text mining, and many resampling methods such as random forests and ensemble models.

This talk describes the cross-over between some of the AI algorithms and modern geological metrics. The techniques are described in the contest of AI and then illustrated using problems associated with forecasting oil production from geological and well attributes. ■

Biographical Sketch

Dr. Jones is currently Executive Professor of Statistics at Texas A&M University and Academic Director of the MS Analytics Degree. In that capacity, he teaches data mining and text analytics, and provides expertise in business analytics and quality assurance to Fortune 500 Companies. His clients include the Department of Treasury, Chevron, IBM, Motorola, and Texas Instruments.

He received a PhD degree in Statistics from Virginia Tech and a BS in Computer Science from Texas A&M University – Commerce. He also has hands on experience developing statistical and data mining software for companies in Silicon Valley and IMSL, the International Mathematical and Statistics Library.

He has taught computer programming and has extensive experience programming in Python, SAS, Java and C.

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. Have fun.

November's winner is Alyssa Kirkendall, a second-year graduate student in San Antonio, and STGS Editor. She correctly identified the ink lettering set in the photo, commonly branded Leroy® by K&E. Congratulations Alyssa!

Wednesday, December 12, 2018
Black Lab Pub, Churchill Room • 4100 Montrose Blvd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

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

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

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

Blaine R. Hall

Geology at the Crossroads Big Bend Ranch State Park

Big Bend Ranch State Park (BBRSP), is the largest of the Texas State Parks covering an area of over 300,000 acres (~1200 square kilometers). The scenery is magnificent and the landscape varies from river lowlands, through deep canyons, across high plateaus, and up steep mountains. Ultimately all of this is controlled by the character and variety of the underlying geology and the processes that created it over millions of years.

But why a **Crossroads of Geology?**

Because, the park's southern boundary follows the Rio Grande from about 10 miles below Presidio through a series of Basin and Range grabens for some 40 miles down-river to Lajitas at the northwest corner of Big Bend National Park. Extensive Cenozoic-age volcanics and intrusives make up the Bofecillos Mountains in the central part of the Park, while the Solitario Dome covers the northeastern corner where early Cretaceous-age limestone mark the flank of the dome and Paleozoic-age chert, sandstone, limestone, novaculite, and shale are exposed in its core. And finally, in southeastern BBRSP early Cretaceous-age shale, marl, and limestone are exposed along the Fresno-Terlingua Monocline.

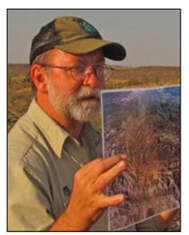
Furthermore, four of the major orogenic events that mark the development of North America converge in BBRSP.

1. The Ouachita/Marathon foldbelt extends through the Marathon Basin and can be seen in the interior of the Solitario Dome, where exceptional exposures of highly deformed Siluro-Devonian Caballos Novaculite occur.
2. The Laramide foldbelt is also represented in the Park, particularly where the lower Cretaceous Santa Elena, Del Rio, and Buda Formations are asymmetrically folded along the Fresno-Terlingua monocline.
3. Undoubtedly, the most dramatic geological event represented in the Park is the mid-Cenozoic volcanism that built up the Bofecillos Mountains as part of the very extensive Trans-Pecos Volcanic Province.
4. And finally, along the south edge of BBRSP, the route of the Rio Grande follows Basin and Range age sediment-filled grabens, marked by long, continuous normal to oblique slip faults exposed along very prominent fault scarps.

And Not the Least, the geology and climate have determined the character of the landscape, which in turn greatly influenced the cultural development of the area, and the cultural development through time determines the history of the region.

So, come on out to Big Bend Ranch State Park and watch for the evidence of all four events. Revive your appreciation for the geological enormity of time and scale and the resulting variety of landscape and scenic beauty, both natural and historical, here at the **Crossroads**. ■

Biographical Sketch



Blaine Hall joined Texas Parks and Wildlife in 2010 as an Interpretive Ranger at Big Bend Ranch State Park where he used a hands-on approach in explaining the natural and cultural history of the park. In particular, he helped visitors understand the geology of the park, how the geology controls the development of the park's landscape, and how the landscape has affected the cultural and historical development of the park. He was uniquely suited for this position because he was able to utilize his wide ranging industry experience, substantial teaching experience, and strong academic background. Blaine completed his BS in Geology at UT El Paso, received his MSc in Geological Oceanography from Dalhousie University, and carried out research in marine geology and geophysics while at Lamont-Doherty Earth Observatory of Columbia University. His industry experience began with Superior Oil in minerals exploration for Proterozoic placer gold (South African type) and Kimberlites

HGS Environmental & Engineering *continued on page 23*

HGS Environmental & Engineering Dinner *continued from page 22*

(Diamonds) in the Rockies, Canada, Kansas, and Arkansas. He then shifted to petroleum, beginning with studies of heavy oil reservoirs in California for Mobil Oil and continued with exploration and production programs in southern South America for Mobil while based in Buenos Aires. He went back to Argentina for Parker and Parsley and consequently, Pioneer Natural Resources. After leaving industry, Blaine returned to his native West Texas and spent the next ten years teaching Geology and Mathematics at Sul Ross State University. While at Sul Ross, he was also very active with the Chihuahuan Desert Research Institute where he developed a permanent exhibit on the geology of the surrounding Davis Mountains and presented workshops for teachers and many other youth and continuing education programs.

Since his retirement from TPWD in 2015, Blaine, now residing in Fort Davis, has continued studying the geology of Big Bend Ranch State Park and guiding the work of others there. He is helping direct the thesis research of Master's students from Sul Ross State University on differing aspects of the Cenozoic volcanism and tectonics in the park, as well as, special projects for undergraduate McNair Scholars. Blaine is also actively involved with UT Austin faculty and staff in studies of the lower Paleozoic units now exposed in the core of the Solitario, an uplifted and eroded intrusive dome in the park.

December 2018 GeoEvents

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Reservations: The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail office@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event.** If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**		**Members Pre-registered Prices:** Dinner Meetings members..... $40 Emeritus/Honorary members..... $40 Student members ..... $10 Nonmembers & walk-ups ..... $45 Except - Env. & Eng. ..... $30 Nonmembers & walk-ups ..... $35 Emeritus/Honorary members..... $15		**Don't wait, make your reservations online at hgs.org**	1
2	3	4 **HGS Board Meeting** *6 p.m.*	5	6	7	8
9	10 **Joint HGS General and TAMU Dinner Meeting** *"The Future of Artificial Intelligence (AI) Applications in Geology," Edward R. Jones, Page 19*	11	12 **HGS Environmental & Engineering Dinner Meeting** *"Geology at the Crossroads Big Bend Ranch State Parks," Blaine R. Hall, Page 21*	13	14 **HGS Office closed for Winter Holiday 12/1418-1/2/19**	15
16	17 **HGS Office closed for Winter Holiday 12/1418-1/2/19**	18	19	20	21	22
23 30	24 **HGS Office closed for Winter Holiday 12/1418-1/2/19** 31	25	26	27	38	29

March 5 – 6, 2019
HGS Applied Geoscience Conference
Subsurface intelligence and Analytics, Page 9

March 23 – 31, 2019
Explore the Solitario Flatirons with HGS Fieldtrip
Big Bend Ranch State Park, Page 18

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

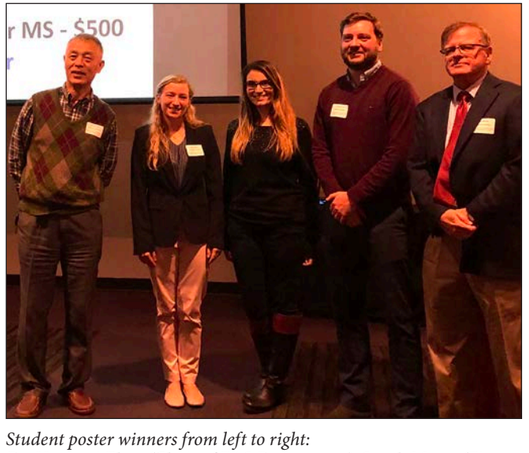
July 22 – 24, 2019
Unconventional Resources Technology Conference (URTeC 2019)
Denver, Colorado

HGS Sheriff Lecture

The annual Robert E. Sheriff Lecture was held at the 12 November 2018 Houston Geological Society evening meeting at the Norris Conference Center. This lecture series has been sponsored annually by the Department of Earth and Atmospheric Sciences at University of Houston and the U.H Geoscience Alumni Association since 1999. Department Chair Dr. Hua-wei Zhou began the meeting with a summary of the activities and recent statistics for the department. Dr. Gary Mavko then presented his lecture "Navigating Messy Rock Physics Problems", pointing out that serious concepts can be conveyed without a flood of equations.

Following the lecture and Q&A, presentation of the Distinguished EAS Alumnus Award was made to Dr. Sean Guidrey by Dr. Hank Chafetz, his former MS and PhD supervisor at the University of Houston. Dr. Chaftez briefly summarized the career of Dr. Guidrey since he completed his PhD at UH in 2001. Before the dinner and meeting, thirty-five UH students presented their work on well-designed posters to the meeting attendees. After the lecture, student awards for the posters were made to Jack Kenning (Advanced PhD), Crystal Saadeh (Advanced MS/1st Year PhD), and Sarah Meyer (Undergraduate/1st year MS).

This lecture and poster session is always a highlight of the annual HGS-UH Sheriff Lecture and we look forward to the future Sheriff events.



Student poster winners from left to right: Dr. Hua-wei Zhou (Chair of EAS Department), Sarah Meyer (First place undergrad), Cystal Saadeh (First place MS/First year PhD), and Jack Kenning (First place, advanced PhD), and Dr. Gary Mavko (left to right).

Presentation to Dr. Sean Guidrey by Professor Hank Chafetz, EAS Department.

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 (as of April 2, 2018)

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

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 (September 2018)

President Signs Bill Authorizing DOE Office of Science

On September 28, 2018 President Donald Trump signed the Department of Energy Research and Innovation Act (H.R. 589) into law after the House passed the bill by voice vote on September 13, 2018.

Originally sponsored by Chairman Lamar Smith (R-TX) of the House Committee on Science, Space and Technology, H.R. 589 establishes the Department of Energy's policies for science and energy research and development programs. The bill contains three main legislative components: Laboratory Modernization and Technology Transfer, DOE Research Coordination, and DOE Office of Science Policy. The directives include the first comprehensive authorization of policy for the DOE Office of Science, including the creation of Energy Frontier Research Centers, Energy Innovation Hubs, and a Solar Fuels Research Initiative. It also addresses challenges associated with DOE's operation of seventeen National Laboratories, which are managed by six different offices, by providing specific guidance and directives on energy science research coordination and reforms to streamline management.

The comprehensive legislation was about 11 years in the making according to the House Committee on Science, Space, and Technology. Chairman Smith said the bill will encourage public-private partnerships to promote economic growth and establish key research priorities to advance technology development.

After the bill's introduction in the House on January 20, 2017, H.R. 589 quickly passed the chamber four days later. On March 6, 2018, Senator Lisa Murkowski (R-AK) introduced a Senate bill with similar language (S. 2503), which the Senate Committee on Energy and Natural Resources approved favorably. The Senate passed the legislation by voice vote on July 23, 2018, after Senator Murkowski amended the bill to strike a fourth legislative component, Nuclear Energy Innovation and Capabilities, from the original text. The House agreed to the Senate amendment before passing the final bill on September 13, 2018.

House Natural Resources Committee Field Hearing Discusses Nexus of Energy and Education

The House Committee on Natural Resources held a field hearing, entitled "Energy and Education: What's the Connection," on August 29, 2018, in Roosevelt, Utah. Chairman Rob Bishop (R-UT-1) led the hearing, which considered testimony from two panels of local stakeholders and aimed to explore energy development on federal lands as a potential revenue source for public education.

According to the Republican committee staff, overly burdensome federal leasing and regulatory requirements have "discouraged greater development, resulting in lost revenue for the federal government and States and jeopardizing greater investment in education."

Chairman Bishop, who spent 28 years as a classroom teacher before entering politics, began the hearing by outlining the importance of the hearing's theme to the lives of Utahans. Utah is currently ranked last in educational expenditures per pupil according to a Department of Education report released in January 2018. In fiscal year 2015, Utah spent $6,751 per student compared to $20,744 in New York, though Chairman Bishop noted that spending does not always equate to quality education. Chairman Bishop noted a correlation between states with large amounts of public lands, mostly in the western United States, and lower per capita student spending. Approximately sixty-three percent of land in Utah is owned and managed by the federal government, leaving fewer sources of potential local revenue for education, according to Chairman Bishop.

The first panel featured Spencer Stokes from the Utah State School Board; Jeff Hanke, a social studies teacher at Union High School; and two students. The second panel featured Shaun Chapoose, a Ute Tribal Councilman, alongside two county commissioners and representatives from the Western Energy Alliance and the Utah School and Institutional Trust Lands Administration.

The panelists largely agreed with Chairman Bishop's call to open up federal lands to energy development for the purpose of increasing funding to public schools. Stokes called for the state to manage or take back federal lands directly. He noted that the large swaths of federal land in areas such as the Uinta Basin – a major oil- and gas-producing region – make it very difficult for the state to obtain revenue from energy production for education.

Chapoose urged the group to consider other reasons for low education budgets in Utah, citing Utah's low property taxes as an under-tapped source of revenue. He suggested that the meeting members and Utah politicians were unfairly blaming the federal government for the misallocation of educational funding.

Government Update *continued on page*

Government Update continued from page

"Funding our schools is not a federal land or energy problem. It is a property tax problem. It is also a problem with how state revenues are distributed," Chapoose said. "Chairman Bishop and some members of the committee want you to believe that federal lands are the problem. That's not true."

House Passes Bill to Establish Every Kid Outdoors Program
On September 12, 2018, the House passed the Every Kid Outdoors Act (H.R. 3186) to provide fourth grade students and accompanying individuals with free access to federally managed public lands and waters, including historic sites such as national parks.

Introduced by Representative Niki Tsongas (D-MA-3), H.R. 3186 codifies the already-existing "Every Kid in a Park" initiative launched in 2015 by President Barack Obama under the Department of the Interior. Seven of the Department's bureaus would be tasked with jointly administering the program, including the National Park Service, the U.S. Fish and Wildlife Service, the Bureau of Land Management, the Bureau of Reclamation, the U.S. Forest Service, the National Oceanic and Atmospheric Administration, and the U.S. Army Corps of Engineers.

Because the bill would codify the existing Every Kid in a Park program, the Congressional Budget Office (CBO) estimates that implementing the program as outlined in H.R. 3186 would result in no additional costs to the federal government. The program is currently funded through the National Park Service's budget for youth engagement programs and from private donations and volunteer hours.

A companion bill was introduced in the Senate (S. 1522) by Senator Martin Heinrich (D-NM) and referred to the Committee on Energy and Natural Resources, Subcommittee on National Parks, on July 19, 2017.

To date, over 350,000 fourth graders across the country have participated in the "Every Kid in a Park" initiative, covering more than 2,000 federally managed sites.

House Passes Bipartisan Legislation to Lease Unused Space in the Strategic Petroleum Reserve
The House passed the Strategic Petroleum Reserve Reform Act (H.R. 6511) on September 25, 2018 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 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). Congress first authorized the SPR in 1975 to help prevent a repeat of the economic disruption caused by the 1973-1974 Arab oil embargo and reduce the impact of crude oil shortages, allowing the president to draw down the SPR in the case of a "severe energy supply interruption."

In December 2016, the House Energy and Commerce Committee requested a Government Accountability Office (GAO) examination of DOE's management of the SPR. GAO released a report on its examination in June 2018, recommending that DOE take several steps to modernize the SPR, ensure that the agency periodically reexamines the size of the SPR, and consider a full range of options for handling excess storage capacity.

H.R. 6511 was introduced by Representatives Joe Barton (R-TX-6) and Bobby Rush (D-IL-1) on July 25, 2018 following a legislative hearing on July 24, 2018 discussing a draft of the legislation. According to testimony from Daniel Evans, DOE's management and operations contractor at the SPR, the bill is meant to help the reserve deal with congressionally mandated crude oil sales, which will leave the SPR with about 300 million barrels of unused storage space by the end of fiscal year 2027. Evans notes that when the mandated sales are completed, the SPR inventory level will be reduced to about 405 million barrels and it will be unable to fully deliver its current mission requirement of 4.4 million barrels per day to the commercial marketplace for a period of ninety days, due to a lack of sufficient inventory distributed among the SPR's sixty storage caverns.

Representative Rush explained that the U.S. energy portfolio has changed dramatically since the SPR was first established and we are now in a position to examine important questions regarding the size, configuration, and necessity for the SPR moving forward. He also highlighted the legislation as a way to maximize taxpayers' return on investment, asserting that it will bring in extra revenue by leasing storage space to friendly foreign allies and private companies.

After passage in the House, the bill was sent to the Senate and referred to the Committee on Energy and Natural Resources, awaiting further consideration by the chamber.

Bill Encouraging Private-Public Nuclear Energy Collaboration Signed into Law
On September 28, 2018 President Donald Trump signed NEICA, the Nuclear Energy Innovation Capabilities Act (S. 97), into law after the House passed the bill by voice vote on September 13. 2018. The bill, sponsored by Senator Mike Crapo (R-ID), encourages partnerships between the Department of Energy (DOE) and private companies to develop new nuclear energy technologies.

According to the Senate Committee on Energy and Natural Resources' report issued after consideration of the bill, nuclear power today relies on light-water reactor technology developed in the 1950s. Economic challenges created by large light-water reactors have resulted in renewed interest in advanced non-light-water reactors from the commercial sector. NEICA establishes the National Reactor Innovation Center (NRIC) to facilitate advanced reactor research. The Congressional Budget Office (CBO) estimates that the implementation of this legislation will cost the federal government $340 million over fiscal years (FY) 2018 through 2022.

"The passage of this legislation underscores the strong bipartisan commitment in Congress that nuclear energy must be maintained as a reliable, safe, clean and efficient part of our national energy portfolio," Senator Crapo said. "S. 97 will eliminate barriers to innovation within the private sector and strengthen collaboration with our national labs to maintain American preeminence in nuclear energy."

Several other bills to advance nuclear energy including S. 2795, H.R. 4979, H.R. 4084, and S. 512 have been introduced in recent years, but NEICA is the first to pass both chambers of Congress.

Earlier this month, on September 6, 2018 Senator Lisa Murkowski (R-AK) introduced a separate bill (S. 3422) that would establish advanced nuclear reactor goals and provide for the full operations of a fast neutron reactor by 2025. S. 3422, the Nuclear Energy Leadership Act, was also referred to the Committee on Energy and Natural Resources and currently awaits further consideration.

House and Senate Committees Hold Hearings on PFAS Chemical Exposure
Both the House and Senate held separate subcommittee hearings this month to address 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, including in firefighting foam and many household products.

According to the Environmental Protection Agency (EPA), exposure to PFAS can lead to adverse human health effects. Studies indicate that PFAS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Though PFAS have been employed since the 1940s, a 2016 EPA drinking water health advisory has led to a recent increase in state regulation and litigation to limit their usage.

The House Energy and Commerce Subcommittee on Environment held a hearing on September 6, 2018, entitled "Perfluorinated Chemicals in the Environment: An Update on the Response to Contamination and Challenges Presented." The hearing aimed to initiate a governmental dialogue on PFAS and included seven witnesses from environmental advocacy groups and federal and state agencies and departments.

"[This hearing] means taking stock of what the government knows about PFAS, what efforts to contain its contamination have promised [sic], and what is preventing people from being helped with cleanup or avoid contamination of the air, soil, and water," Subcommittee Chairman John Shimkus (R-IL-5) said.

In his opening statement, Dr. Peter Grevatt, director of the Office of Ground Water and Drinking Water at the EPA, identified protecting America's drinking water as one of the EPA's top priorities. According to Dr. Grevatt, under the Toxic Substances Control Act, the EPA has issued significant new use rules (SNURs) for PFAS chemicals to guard against their reintroduction into products. Under the Safe Drinking Water Act, the EPA has monitored the presence of six PFAS since 2012 to understand the occurrence of these chemicals in drinking water systems. The EPA is also working to push research forward on PFAS to better understand their health impacts.

The Senate Homeland Security and Governmental Affairs Subcommittee on Federal Spending Oversight and Emergency Management held their respective PFAS hearing three weeks later on September 26, 2018. The hearing, entitled "The Federal Role in the Toxic PFAS Chemical Crisis," featured two of the same witnesses, Dr. Grevatt and Maureen Sullivan, the deputy assistant secretary of defense for environment at the Department of Defense (DOD).

Instead of leading the hearing as the top-ranking majority member, Subcommittee Chairman Rand Paul (R-KY) yielded to Ranking Member Gary Peters (D-MI) to lead the meeting because of Senator Peters' personal connection to the subject: according to the Environmental Working Group, Michigan has the most known PFAS contamination sites in the United States.

Sullivan said during introductory marks at the Senate hearing that the DOD has been leading the way to address the use of PFAS. After the EPA advisory in 2016, the DOD tested 524 drinking water systems that serve two million people on DOD instillations worldwide. The DOD then followed recommendations to provide bottled water or additional treatment in those locations.

Prior to the two hearings, Senator Debbie Stabenow (D-MI) introduced two bills on August 23, 2018, that seek to address the PFAS crisis.

S. 3382, the PFAS Detection Act of 2018, would require the U.S. Geological Survey to perform a nationwide survey of PFAS contamination. S. 3381, the PFAS Accountability Act of 2018, would encourage federal agencies to coordinate with states on cleaning up PFAS pollution. Both bills have support from senators on both sides of the aisle. ■

Government Update

Remembrance

Michael (Mike) Alexander
1930-2018

Michael (Mike) Alexander, 88, passed away on October 26, 2018. He was born in Syracuse, NY, grew up in Mt. Vernon, NY, graduated from high school there, and went to sea at age 17 in the Merchant Marines. Mike was fortunate to win a scholarship to Colorado School of Mines, enabling him to work his way through school by means of various summer and campus jobs. He graduated in 1952 as a Geophysical Engineer and began his 38-year career with Humble Oil (now ExxonMobil) as trainee on a seismic field crew. After various office assignments, a "temporary" assignment finally brought him to Houston in 1966. He was assigned to a digital seismic processing team, and then to a newly-formed gravity/magnetics section. After retirement in 1991, he began a second career as a geophysical consultant, primarily with IGC in Houston. While working in New Orleans, Mike married Barbara Wilkins. Barbara died in 2009. Mike is survived by two sons and daughter-in –laws and two grandchildren. He also leaves behind his precious friend Margie Abel and first cousins Jeanne Hansen, Joan Taylor and Peg Guy.

He enjoyed outdoor activities, especially running and hunting.

This is a summary of his life that was published in *Houston Chronicle* on Nov. 11, 2018

HGS Welcomes New Members

New Members Effective November 2018

ACTIVE MEMBERS
Tom Byrd
Pete Frazier
William Gough
Elizabeth Hardesty
Cory Hungate
Jerome Kendall
George Losonsky
Carolyn Lowe
David Montoya
Scott Payton
Thomas Plumridge
Kirsten Siebach
Rose Telus

ASSOCIATE MEMBER
Tiffini Kennedy

EMERITUS MEMBERS
James Holmes
Lindsay Tade

STUDENT MEMBERS
Samsideen Ajala
Olawade Ariyibi
Andrew Braun
Joshua Cecil
Haydon Clason
Jieying Ding
Joshua Hardt
Ninjie Hu
Katy La Fleur
Cindy Lazo
Cullen Sharkey
Brock Smith
Peter Steele
Lin Xiong

Welcome New Members

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*** _____

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