Volume 62, Number 6

HGS Bulletin

Houston Geological Society

February 2020

Dr. Jessica Watkins
NASA Astronaut and Geoscientist

HGS Scholarship Night Speaker

February 10, 2020
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The Bulletin
Houston Geological Society
Volume 62, Number 6
February 2020

In Every Issue

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Technical Meetings

Other Features

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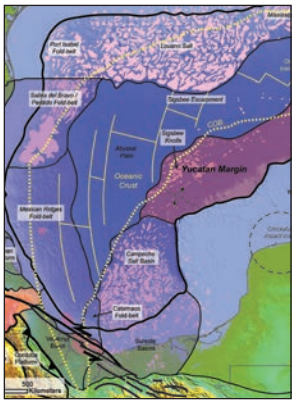

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About the Cover: The background photo shows the Curiosity Rover on Mars. The insert is a portrait of Astronaut Dr. Jessica Watkins, our 2020 Guest Night speaker. The photos were taken by NASA and supplied by Charles Sternbach.

FOR YOUTH DEVELOPMENT®
FOR HEALTHY LIVING
FOR SOCIAL RESPONSIBILITY

GIVING BACK

Annual Volunteer Day at YMCA Camp Cullen

Geological Society Members and friends are needed for our Annual Volunteer day at YMCA Camp Cullen!

February 15, 2020

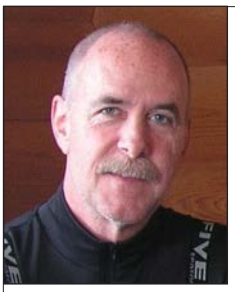
Do you have a burning desire to give back?
The HGS is teaming up with the YMCA to have a Volunteer Day on Saturday February 15th, 2020. The volunteer work we do that day will be at Camp Cullen, a YMCA summer camp located near Trinity, Texas.

We chose to help Camp Cullen this year for several reasons. First of all, most of the kids attending Camp Cullen are from the Houston area. Also, many campers are from underprivileged families and attend the camp free of charge. Last, but not least, there is a significant geology component to the camp's programs with an actual geologic field trip in the quarry, a geology lab with hand samples onsite, and a "gold" panning area for younger kids. HGS also conducts its Outcrop Family Campout here each year.

The work planned for our group this year is to work with other volunteers in the gold panning area to build a Saloon Façade, a Jail Façade, a Mine Shaft Entrance, and a Water Tower to complete the Old West look and feel of the area.

So, if you would like to do a good deed, spend a nice day in the Piney Woods, and perhaps help get kids interested in geoscience, please consider donating part of a Saturday to this effort. You don't need any special skills, just a willingness to help. Depending on where you are located in the Houston area, it takes about 1 to 1 ½ hours to get to the camp. We plan to start work at ~9am and will conclude by mid-to-late afternoon. Lunch, snacks and refreshments will be provided.

The YMCA has also agreed to provide a bus to transport our volunteers if we get a good crowd. If you want to help, please contact HGS member John Adamick at jadamick@stauroliteconsulting.com at your earliest convenience.



Jon Blickwede
president@hgs.org

Planning for HGS's 100th Birthday

This month, I've decided to take a detour from my exploration theme to highlight the fact that the centennial of the HGS is just around the corner and the preparations for celebrating this milestone are well underway. The HGS 100th Year Anniversary Committee is co-chaired by Charles and Linda Sternbach, who summarize the current plans:

"On August 8, 2023 HGS will officially celebrate its 100th Anniversary. This is a major event for HGS, and it's just the beginning. HGS leads the way for other geological societies in the Gulf Coast Association of Geological Societies (GCAGS), who will follow with their own centennials in the years after HGS. The committee anticipates that HGS will feature a variety of events, including:

- A public outreach event (similar to HGS Guest Night) at the Houston Museum of Natural Science the year before the centennial, to help build excitement and raise sponsorship awareness for the centennial itself
- A celebration party on the actual anniversary (Tuesday the 8th of August 2023)
- A two-day, standalone technical conference (probably September 2023) bringing together global experts on Gulf of Mexico (GoM) geoscience. Sessions will include structure and tectonics, sedimentation, petroleum systems, historical plays, technology and future opportunities. We will also focus a session on *What Do We Still Not Know About the GoM?*
- A two-day conference and field trip, in collaboration with the Petroleum History Institute, to visit historical sites and locations in the greater Houston area, in conjunction with the abovementioned technical conference
- HGS hosts GeoGulf (GCAGS annual convention) in Houston (October 2023).

In addition, we are exploring the potential of creating video tributes of past HGS presidents, great explorers and notable geoscientists. We are looking into special publications and ways to engage oil companies of every size, service companies, Houston area universities, museums, library collections, media and the general public."

If you are interested in helping with any part of the HGS Centennial, please contact Linda at linda.sternbach@gmail.com or Charles at carbodude@gmail.com.

I've recently been reading a little about the history of HGS, starting with *Rockhounds of Houston* by the pioneering Humble (now ExxonMobil) paleontologist Alva Ellisor, published in 1947. In it, I discovered some interesting bits of HGS trivia, including:

- The precursor to the HGS was the Houston Academy of Sciences, founded by Edwin T. Dumble, who was the first State Geologist of Texas (1888), and also founded the first commercial geological department in the US dedicated to the "winning of oil from the Earth" (1897, Southern Pacific Railroad).
- There were 73 charter members of the HGS when it was founded in 1923, including E.T. Dumble and other petroleum geoscience legends such as Alva Ellisor (who became the society's first vice-president), Everett DeGolyer, Sidney Powers, and Wallace Pratt ("Where oil is first found, in the final analysis, is in the minds of men.") Seven of the 73 charter members were women, all of whom were paleontologists.
- The first major task of HGS was to organize and run the 9th annual meeting of the AAPG which was held in Houston in 1924 and had 310 attendees and 91 presentations. All 91 papers were related to salt diapirs and ended up being published in the very first AAPG special volume (Powers, 1926).
- Technical presentations at HGS meetings commenced in 1929. Just as today, talks given in those early days of the society were focused both on local, Gulf Coast geology (e.g. *Deltaic Coastal Plain Character of Southeastern Texas*, D.C. Barton, 26 November 1929) and geologic topics from many parts of the world (e.g. *The North Germany Salt Dome Basin*, J. Brian Eby, 1 February 1933).

By the end of World War II, the HGS had become the largest local geological society in the world – which it has remained to the present day.

By the way, don't forget to attend this month's HGS Scholarship Night dinner meeting at the Norris Center on Monday, February 10. It promises to be a great evening, first and foremost to honor the 2019–2020 scholarship recipients from HGS's Foundation Fund and Calvert Memorial Fund. I will also be introducing the slate of candidates for the 2020-2021 HGS Board. And as a special feature, newly minted NASA astronaut and geologist Dr. Jessica Watkins will be our guest speaker. Hope to see you there! ■

References:

Ellisor, A.C., 1947, *Rockhounds of Houston: An Informal History of the Houston Geological Society*: Houston Geological Society, 99 pp. https://www.hgs.org/sites/default/files/ROCKHOUNDS%20OF%20HOUSTON.pdf

Powers, S. (ed.), 1926, Salt Dome Oil Fields: AAPG Special Volume 1

Pratt, W.E., 1952, Toward a Philosophy of Oil-Finding: *AAPG Bulletin* vol. 36, no. 12, p. 2231-2236.

GeoGulf 2020 Call for Papers

70th GCAGS/GCSSEPM Convention and Exposition
Sept. 30–Oct. 2, 2020 • Lafayette, Louisiana

Hosted by the Lafayette, Baton Rouge, and New Orleans Geological Societies

GeoGulf 2020 Session Themes

- "All Things Salt"—Tectonics, Oil and Gas, Seismic Acq., Proc., and Interp., Mining, etc.
- Machine Learning and Artificial Intelligence Applications
- GCSSEPM Special Session—Topic to be announced
- Gulf of Mexico Temperature and Pressure
- Smackover Session and Core Workshop
- GIS Technology and Applications
- Gulf Coast Environmental
- The Business Side—Legal, Unitization, Finance, Insurance, etc.
- Geoscience Applications of Drone Technology
- Geomechanics—Conventional and Unconventionals
- Carbon Capture / Underground Storage
- Shallow Hazards
- Success from Failure—Learning from our Mistakes
- And more—We are the place for Gulf Coast Geoactivities! We'll fit you in! Got an idea for a theme session, please let us know!

Professionals and Students: We welcome you to submit an abstract for consideration of oral or poster presentation of 250–300 words by February 3, 2020.

Early abstract submissions will be reviewed within a day or two of receipt with acceptance/rejection notification. Submit via email, title, author(s) (with full contact information for each, including company or school, full address with zip code, email, and phone number), and abstract (preferably with 1–2 representative illustrations including reference from text and with captions) to General Chair, James J. Willis, james.willis@gcags.org.

All accepted presenters are expected to submit an initial draft of full paper or extended abstract for publication in the *GeoGulf Transactions* by April 1, 2020, to the *GeoGulf Transactions* Editor, James J. Willis, james.willis@gcags.org. Full information, instructions, size limitations, and helpful hints for abstracts, extended abstracts, and full papers will be posted soon at www.geogulf.org.

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 16, 2019. Once accepted for publication, the deadline for submitting a full manuscript is April 2, 2020. Full instructions for manuscript submissions will be posted online at http://www.gcags.org. Convention presentations of *Journal* submissions are encouraged, but not required.

Fang Lin
editor@hgs.org

Becoming a Truly Active Member

Fellow HGS members: I hope your 2020 has been going well. This month I want to encourage you to become a truly active member of our society. At any time of a year there are typically somewhere between 2000–3000 registered HGS members on book, including student members, associate members, active members and emeritus members. The majority of us pay our membership dues year after year, which is great and important. Thank you for doing that. However, the number of members who have participated in activities organized or co-organized by HGS throughout a year is only a small fraction of the total membership population. This means quite many members are only "active" on our membership roll. It also means that many of our members have not fully realized the benefits of being an HGS member, in my humble opinion.

So what do I mean by "becoming a truly active member"? What are the ways to become more active? In my mind, there are multiple ways to become a truly active member. First, one can register as an HGS volunteer. It's easy. Just send HGS office manager Andrea Peoples an email (Andrea@hgs.org) or call her (713-463-9476) to express your interest. HGS is always in need of volunteers given the wide variety of events that we host. Second, if you see something is missing in our current program which could benefit many of our members, feel free to bring it up and propose to organize a new event for HGS Board consideration. I believe many of our existing committees started that way. On the other side, if you do not have time to take a leadership role in organizing any event, you can still be a truly active member by participating in HGS meetings, conferences, and social events. Interested in technical learning? No problem, we have monthly dinner meetings and luncheons on a wide range of technical topics. Looking for something that you could bring along your family and children? We have field trips, camp-out events, shrimp peel, tennis tournament and many other activities. Early on in your life and career and just want to know more people? There are events designed just for you. Our neoGeos Committee organizes Geo Trivia Nights, Happy Hours and other activities for young professional earth scientists. Contact Casey Langdon (clangdo3@gmail.com) if you want to know more.

…you will be amazed by how quickly you can expand and diversify your professional network by attending HGS events. I think this is a unique advantage of becoming a member of a professional society like HGS.

In this month, a series of excellent events have been lined up for our members. On February 10, is our annual Scholarship Night. Not only will many outstanding geoscience students be recognized on that night, we are also privileged to have NASA astronaut and geoscientist Dr. Jessica Watkins as our guest speaker. Want to learn something about the Artemis program? This is a chance to ask questions. On February 12, Dr. Neil Bockoven, an award-winning geologist and journalist will talk about the Neanderthals and homosapiens. On February 24, Mr. Jack Kenning will discuss his research on a hot exploration area, southern Gulf of Mexico. February 26, Mr. Rudy Wilhelm will discuss a challenging topic around mapping hydrocarbon migration pathways. On the social events side, HGS 2020 Tennis Tournament will be held on April 25, 2020. If you are interested in competing in the games, it's the time to warm up. Want to help school children to learn geology? YMCA Camp Cullen event on February 15 is looking for volunteers. Want to meet other young earth scientists like yourself? you won't want to miss the Geo Trivia event on February 26. Last but not least, you just want a Spring recharge, the Shrimp Peel & Crawfish Boil on April 17 may help.

I am thrilled knowing all these events are coming our way and hope you feel the same. One thing that I would like to share with you, particularly those of you who do not have the opportunity to interact with many people outside your day-to-day job, like my job used to be, you will be amazed by how quickly you can expand and diversify your professional network by attending HGS events. I think this is a unique advantage of becoming a member of a professional society like HGS. Therefore, I encourage you to take advantage of what HGS offers. Sign up for some of the meetings and events, connect with your old friends, make new friends, and learn something new. Until next month. ■

HGS Scholarship Night & Dinner Meeting

HGS Foundation Scholarship & Calvert Memorial Fund
February 10, 2020
Speakers: Jessica Watkins, NASA Astronaut Candidate
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
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- 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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- Formal recognition at event
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- 1 Complimentary dinner registration
- 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.

Name of Card holder:_____ Card Type: _____

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Monday, February 10, 2020

HGS Scholarhip Night
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

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.

Taking the HGS Scholarship Night to Greater Heights with Astronaut Jessica Watkins!

By Charles A. Sternbach and Jeff W. Lund

The HGS Scholarship Night committee is excited to announce that we will have the pleasure of having Dr. Jessica Watkins, NASA astronaut and geoscientist, as our speaker for the 2020 HGS Scholarship Night planned for Feb 10, 2020! The event will be held at the Norris Conference Center, in City Centre starting at 5:30 PM. We anticipate a full house. Reservations can be made on the HGS.org webpage link. https://www.hgs.org/civicrm/event/info?id=2120

In recent years, our annual Scholarship Night has become a premier event for the HGS. This is a night where we take the time to honor outstanding students with promising futures. This year the HGS Scholarship Night committee asked; who can inform, uplift, and inspire the next generation scholarship winners? Our answer: Jessica Watkins. It is a time-honored tradition of the HGS to recognize astronauts who are also geoscientists and Jessica is among the next generation of astronaut leaders who will one day return to the moon or even walk on Mars.

Jessica Watkins has been selected by NASA to join the 2017 Astronaut Candidate Class. She reported for duty in August 2017. The Colorado native earned a Bachelor's degree in Geological and Environmental Sciences at Stanford University, and a Doctorate in Geology from the University of California, Los Angeles (UCLA). Watkins has worked at NASA's Ames Research Center and NASA's Jet Propulsion Laboratory, and was a collaborator on the Mars Science Laboratory rover, Curiosity.

Watkins was born in Gaithersburg, Maryland, but considers Lafayette, Colorado her hometown. Her parents, Michael and Carolyn Watkins, still live there. In college, she was a member of Stanford Women's Rugby as well as the USA Rugby Women's Sevens National Team. During her postdoc, she served as a volunteer assistant coach for the Caltech Women's Basketball team. She also enjoys soccer, rock climbing, skiing and creative writing. She graduated from Fairview High School in Boulder, Colorado. Earned a Bachelor's degree in Geological and Environmental Sciences from Stanford University in Stanford, California. Earned a Doctorate in Geology from the University of California, Los Angeles.

For her PhD research, Watkins studied the emplacement mechanisms of large landslides on Mars and Earth through orbital data analysis and field work. While at UCLA, she was a teaching assistant for various courses in earth and planetary science. At the time of her selection in June 2017, Watkins was a postdoctoral fellow in the Division of Geological and Planetary Sciences at the California Institute of Technology, where she collaborated on the Mars Science Laboratory rover, Curiosity, participating in daily planning of rover activities and investigating the geologic history of Gale Crater, Mars.

During undergraduate internships at NASA's Ames Research Center, Watkins conducted research supporting the Phoenix Mars Lander mission and prototype Mars drill testing. She also served as chief geologist for NASA Spaceward Bound Crew 86 at the Mars Desert Research Station in 2009. As a graduate student, Watkins participated in several internships at NASA's Jet Propulsion Laboratory (JPL), including analysis of near-earth asteroids discovered by the NEOWISE mission in 2011, tactical and strategic planning for the Curiosity mission in 2013, and system design testing for the upcoming Mars 2020 and Mars Sample Return missions the following year. In addition, she served as a science operations team member for a Desert Research and Technology Studies (Desert RATS) analog mission at NASA's Johnson Space Center in 2011 and participated in the NASA Planetary Science Summer School at JPL in 2016. Watkins reported for duty in August 2017 to begin two years of training as an Astronaut Candidate. Upon completion, she will be assigned technical duties in the Astronaut Office while she awaits a flight assignment.

Jeff Lund, our Calvert Memorial Scholarship Fund Chairman reports that the Warren L. and Florence W. Calvert Memorial Scholarship came from a generous donation from former HGS member Warren Calvert in the late 1970's. Thanks to the generosity of HGS Members and various corporate sponsors we have been able to continue supporting promising future geoscientists in their studies. The Calvert Memorial Fund Scholarships are given to graduate students studying geosciences. The Calvert Memorial Scholarship Fund program consists of a passionate, five-person Board of HGS Members, listed below, dedicated to supporting students and the future of the geoscience field.

HGS Scholarhip Night *continued on page 11*

After the successful introduction of Geo Trivia Night in 2019, the NeoGeos will be starting the Spring Season in late February and continue through May for a total of four events. Geo Trivia Night was started to refresh the ever so common Happy Hour by introducing an event that brings together geoscientists for some good drinks, great conversations, and some healthy competition. The committee has viewed this event as a team-building opportunity for company geoscience departments as well as an opportunity for Houston geoscientists to network. Please come to join us on Wednesday, February 26th, 7pm – 9pm.

Second EAGE/HGS Conference on Latin America

19-20 NOVEMBER 2020 • CARTAGENA, COLOMBIA

Save the date!

- **Join us!**

WWW.EAGE.ORG

Wednesday, February 12, 2020

New Location: Craft Republic Houston • 11470 Westheimer Rd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

New 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.

Neil Bockoven, PhD

Three Paleo Human Mysteries

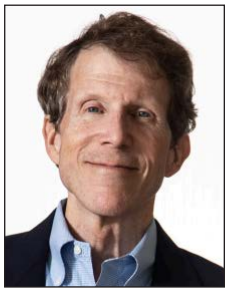
Mystery One: Did we mate with Neanderthals and have viable offspring? If so, what genetics did we get from them? Yes, we interbred, but apparently, only male Homosapien-female Neanderthal pairings survived or were fertile. From the Neanderthal genes we got enhanced viral immunity, but also predispositions for ailments such as lupus, Crohn's disease, type 2 diabetes, actinic keratosis, and depression.

Mystery Two: Neanderthals lived in Europe for more than 250,000 years. When we (Homosapiens) arrived on the scene about 45,000 years ago, they disappeared quickly – forever. What happened? Five major factors played a role in the Neanderthal demise: 1) Homicide by modern humans; 2) Disease brought by modern humans; 3) Competition for food and resources; 4) Our larger population absorbed their smaller one; and 5) Climate change brought on by the Campanian ignimbrite eruption.

Mystery Three: Why is an Australian aborigine genetically more similar to a Scandinavian than an African tribesman is to a member of a different African tribe? A small subset of the African population (with their relative lack of genetic diversity) left Africa about 70,000 years ago, and they populated the rest of the world.

In addition to answering these and other intriguing questions, we'll discuss the huge breakthroughs coming from ancient DNA analysis, and the different information we get from the three types of DNA. ■

Biographical Sketch



Neil Thomas Bockoven is an award-winning PhD geologist and journalist with 35 years of experience in industry. He has been featured in: Geological Society of America Bulletin, Association of Petroleum Geologists Bulletin, Virginia Journal of Science and many other scientific publications.

Neil worked as a geologist in Denver, Midland, Houston, New Orleans and Albuquerque. He attended The College of William and Mary, where he was a member of the state champion swim team, and received a Bachelor of Arts. He went on to The University of Texas at Austin, earning a masters and doctorate.

Neil has published articles on topics as diverse as the geology of huge volcanic calderas of the Sierra Madre Occidental Mountains of Mexico to sexual dimorphism in Astarte clams. His current interests center on the interaction between Early Modern Humans and Neanderthals during the Paleolithic Age, and the amazing related discoveries being made through archaeology and genetics.

HGS Shrimp Peel & Crawfish Boil

Friday April 17, 2020 12:00 – 6:00pm

Bear Creek Pioneers Park, Pavilion 6

3535 War Memorial Street, Houston, TX 77084

(Pavilion #6 is located off Bear Creek Dr.)

Boiled Shrimp
Cajun Crawfish
Corn & Potatoes
Beer & Beverages
DJ Music!

Ticket Cost

HGS Member- $30
Non-Member- $35
Walk-Ups- $45

Register online at WWW.HGS.org
www.hgs.org/shrimp_peel_2020

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

Music Sponsor $1000.00 - 4 Complimentary event tickets

Platinum Corporate Sponsor $1000.00 – 4 Complimentary tickets

Gold Corporate Sponsor $750.00 - 2 Complimentary ticket

Silver Corporate Sponsor $500.00 - 1 Complimentary 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

Monday, February 24, 2020

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

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.

Jack Kenning
University of Houston

Tectonic Evolution, Hydrocarbon Potential and Play Prospectivity of the Deep-water Yucatan Margin, Southern Gulf of Mexico

The stratigraphy, structure, and hydrocarbon potential of the deep-water Yucatan margin is less understood than other provinces of the Gulf of Mexico as the area has a minimal history of hydrocarbon exploration and as a result very few well penetrations. Along the margin of the deep-water northeastern GOM offshore Florida, the post-salt section records late Jurassic-Cretaceous gravity sliding of rafted blocks along a basinward-dipping layer of middle Jurassic salt, which is mostly analogous to the deep-water Yucatan margin. Understanding the tectonic development of the Gulf of Mexico and this linked history between the northern and southern margins of the Gulf of Mexico is essential for developing play concepts in frontier areas of the basin. This study uses a grid of PSDM 2D seismic profiles covering an area of approximately 120,000 km² to map the structure and stratigraphy of the analogous area of gravity sliding and salt tectonics along the less-studied, conjugate Yucatan margin to the south. Two primary structural domains can be defined based on their distinctive salt structures and style of deformation: an up-dip, late Jurassic-Cretaceous section of gravity slides, associated salt-rollers, and their normal faults rooted to a basinward-dipping salt detachment, and a distal area exhibiting large salt diapirs and salt pillow structures in an outer marginal trough collapse located adjacent to the continent-ocean boundary. Despite the presence of widespread oil slicks along the continent-ocean boundary, the thermal maturity level and locations of source rock kitchen areas have not been well defined. Thermal 1D modeling of six pseudo-wells positioned along-dip was performed using estimates of lithospheric thickness and heat-flow. Integrated 3D model results indicate the principal Tithonian-age source rock reached the oil window over most of the deep-water salt diapiric province since the Oligo-Miocene. Inherent model uncertainty was addressed using a range of thermal scenarios, demonstrating that deeply-buried, salt-related mini-basins along the marginal rift are very low-risk, while the uppermost slope is much higher-risk for maturity. Large, salt-related structural traps are located directly adjacent to oil kitchens within deep

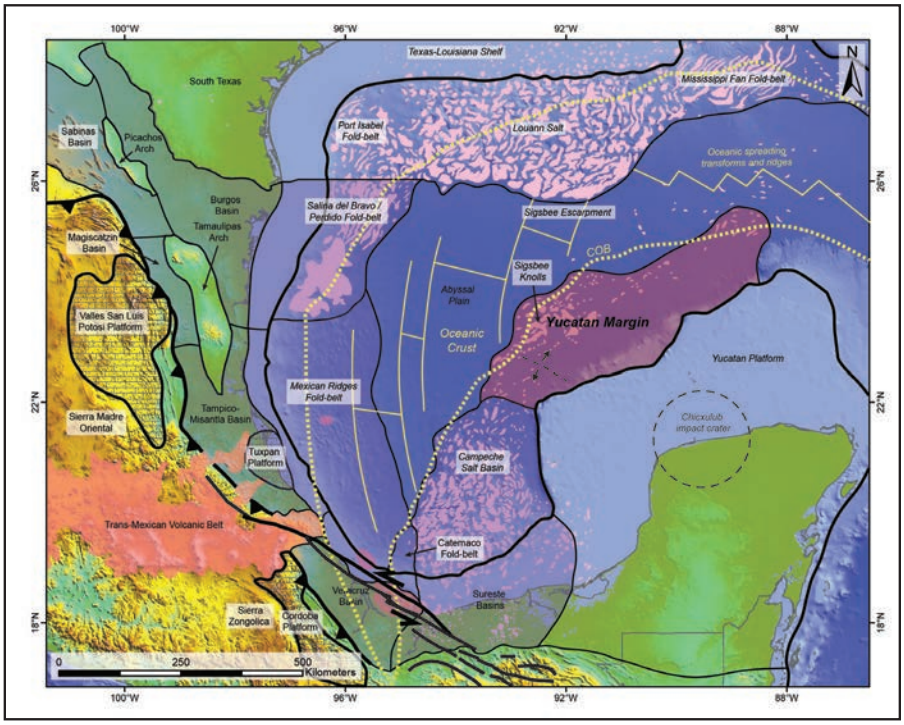
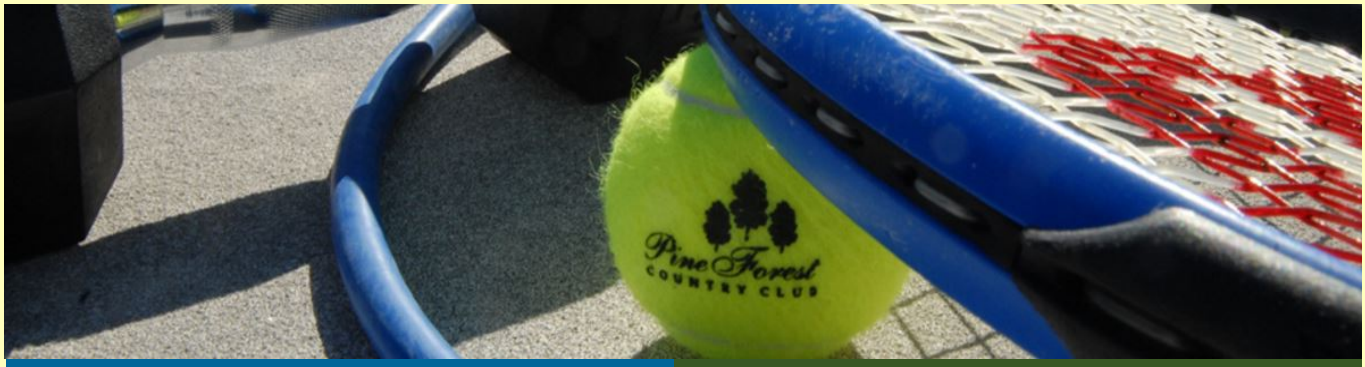


Figure 1. *Map showing the main structural and basinal provinces of the Gulf of Mexico and its onshore areas in eastern Mexico. The deep-water Yucatan margin is located along the northern continental margin of the Yucatan Peninsula and is bounded by the Yucatan Shelf to the south, the deep-water Campeche salt basin to the southwest, and the abyssal Gulf of Mexico to the north.*

HGS International Dinner Meeting *continued on page 13*

2020 HGS Tennis Tournament

players: $65.00
non-players: $20.00



Saturday, April 25, 2020

8:00 am - 12:00 pm

Pine ForestCountry Club

18003 Clay Rd.

Houston, Texas, 77084

Sponsorship Opportunities:

The Big Four: $1,000.00

GOAT: $700.00

Grand Slam: $500.00

ATP World Tour Finals: $300.00

For more information visit www.hgs.org/events

HGS International Dinner Meeting continued from page 11

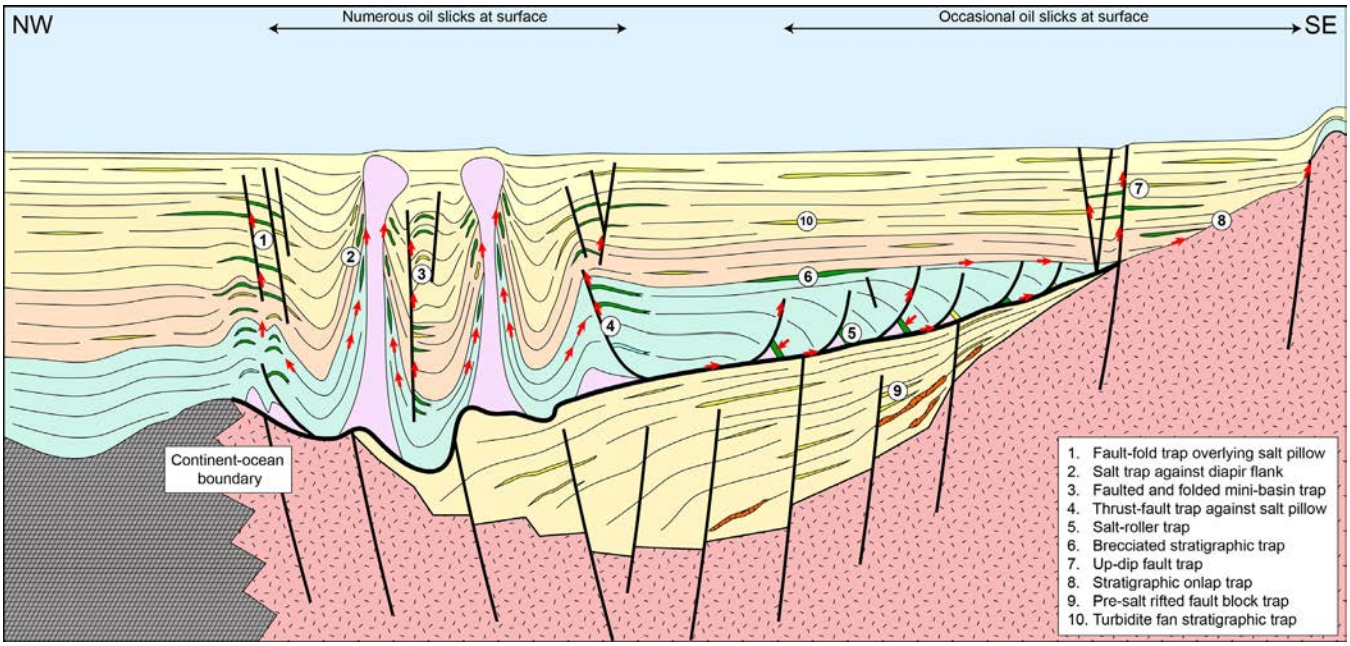


Figure 2. *Play schematic summary profile across the deep-water Yucatan margin illustrating a variety of potential structural and stratigraphic trapping configurations identified across the area from the seismic data. Potential routes for hydrocarbon migration from deep, thermally mature kitchen areas, via both vertical fault conduits, and through long-distance lateral migration are characterized.*

salt-withdrawal mini-basins, where accompanying vertical faulting allows for effective migration pathways – as supported by structurally-associated clustering of numerous oil slicks at the sea surface. Evidence suggests the possibility for long-distance lateral migration of hydrocarbons up-dip along the detachment, where reconstruction of the conjugate margins suggests a potential play fairway for Norphlet-equivalent aeolian reservoirs across the salt-roller province. While hydrocarbon modeling suggests the pre-salt is unlikely to be charged by the late Mesozoic petroleum system, if Triassic lacustrine source rocks are present in this section, as have been encountered along the northern Gulf Coast, significant parts of the syn-rift sequence are still predicted to be gas mature at present day. ■

Biographical Sketch

Jack Kenning is a PhD candidate and research assistant working in the Conjugate Basins, Tectonics, and Hydrocarbons (CBTH) research group at the University of Houston. His research focuses on the tectonics, structural development, and hydrocarbon prospectivity of the under-explored Mexican sector of the deep-water Gulf of Mexico. Mr. Kenning has prior experience working in the oil and gas industry for Anadarko Petroleum and ConocoPhillips. He has worked in both Europe and the USA in several roles ranging from international exploration, operations, unconventional development and research.

HGS Scholarship Night Meeting continued from page 7

In 2019, the Board awarded scholarships to fifteen individual geoscience graduate students, twelve of whom were first time recipients. The awardees included four PhD candidates and eleven M.S. candidates from eight universities. In 2019, we were fortunate enough to not only give more scholarships to students as well as largest monetary amounts in the history of the program. The Calvert Board is very excited to have Astronaut Jessica Watkins as our 2020 Scholarship Night speaker. We believe she is an outstanding member of the geoscience profession and a tremendous role model for all of the students.

Evelyn Medvin, our Foundation Chair, reports that the HGS Foundation Fund will award scholarships to top undergraduate geoscience students from 7 Texas Universities. Because of the generosity of our sponsor companies, we are able to provide $3500 scholarships to 6 of the students and $4500 to our Mabe Scholar, the top scholar of the group. Please come and meet your future employee!

The HGS scholarship Night committee would like to recognize John Tubb for his past chairmanship of this committee. Johns vision built a solid foundation upon which the committee continues to reach for greater heights. ■

2020 HGS-PESGB Africa Conference

September 15-16, 2020

Norris Conference Centers | Houston, TX

Call for Abstracts Deadline:
April 1, 2020

HGS-PESGB Africa Conference 2020
Africa – New Ideas, Plays and Innovation

Exploration in Africa has undergone several exploration cycles throughout its history. In many places where giant discoveries have been made, production is in decline and investment has not sustained the growth of the industry. The theme for the 2020 Conference is focused on what can be and what has been done differently. What ideas should be tested? What has industry learned that should guide us toward new ways of thinking about exploration and development in Africa? What are the potential new areas with hydrocarbon potential? What technology(s) can help unlock additional reserves in existing basins and help find new reserves in unexplored areas? How government can attract and promote investment in new and existing areas.

Technical Session Themes

1) Africa – New ideas in an old area
   a. Known plays to be tested in new areas
   b. Mapping known plays across multiple basins

2) Applications of New Technology
   a. Adding reserves in existing basins
   b. Reducing cycle time and costs in exploration
   c. Integration of multiple technologies to unlock future potential

3) Africa - New areas and ideas
   a. Frontier exploration plays
   b. New exploration plays in under explored areas

4) Africa – A new approach to increase investment
   a. Government participation and cooperation
   b. Corporate responsibility and ways to engage communities
   c. Sustainable solutions to Africa's energy needs.

Submit abstracts - Africa2020@hgs.org

Wednesday, February 26, 2020

HGS General Luncheon Meeting

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.
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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.

Rudy Wilhelm
rudy_wilhelm@yahoo.com

How Hot is the Kitchen? Hydrocarbon Migration Tomography

On 1 March 1993, W.G. Leach published a three-part OGJ article confirming that "The bulk of all oil and gas reserves in the South Louisiana Tertiary sands is concentrated near the top of abnormal pressure." But on 3 Nov 1997, Guzman et al. demonstrated in an OGJ article the usefulness of seismic velocity data for explorers by publishing numerous named examples of velocity slowdowns above some famous oil and gas fields in the GOM and onshore South Texas. This apparent contradiction spooked us. The puzzle has now been resolved using Hydrocarbon Migration Tomography (HCM) scans.

Today, the case studies presented will illuminate, for probably the first time, the HC migration pathways from their putative sources into and through famous oil and gas fields and costly dusters on the shelf, in deep water, and abroad. Explorers may experience a "come-to-Jesus" moment. ■

Biographical Sketch

Rudy Wilhelm holds a MS in Physics, a MS in Petroleum Engineering and passed Stanford University Mark Zoback's online Reservoir Geomechanics course. He used to be a Geophysicist at Shell Oil Co. More at www.oilvel.com.

Monday, March 2, 2020

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.
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James (Jim) M. Rine
Wayne State University

How a Carbon Tax Could Benefit U.S. NG Producers, But for How Long?

The analyses presented show how a Federal carbon fee could benefit US natural gas (NG) producers while meeting the COP21 goal of avoiding an increase in global temperatures of +2°C (3.6°F) above pre-industrial levels (Rine, 2019a). Absent a Federally mandated carbon tax, however, unilateral reductions in production by petroleum companies could result in costly opposition from stockholders and investors. The basis of the analyses are modeled responses to a 25-year national carbon fee & dividend (CFD) program beginning in 2025 at $10/metric ton (t) of CO_2 emissions and increasing annually by $10/t. The CFD program, if enacted nationwide, would within a decade begin the elimination of coal usage for electrical power generation while incentivizing carbon capture and storage (CCS) for NG. In theory, US NG producers with a CFD stimulated CCS program could not only attain an 80% drop in US carbon emissions by 2050 (for combined coal and NG usage), they could produce more NG than following a business as usual approach (BAU; **Figure 1**).

Also addressed are how growth rates of renewable energy and cost of commercial energy storage might impact US demand for NG (Rine, 2019b). Present day levelized costs of energy from new commercial-scale solar and wind powered facilities are already competitive with NG facilities. But growth of US renewable energy projected by the Energy Information Administration (EIA)

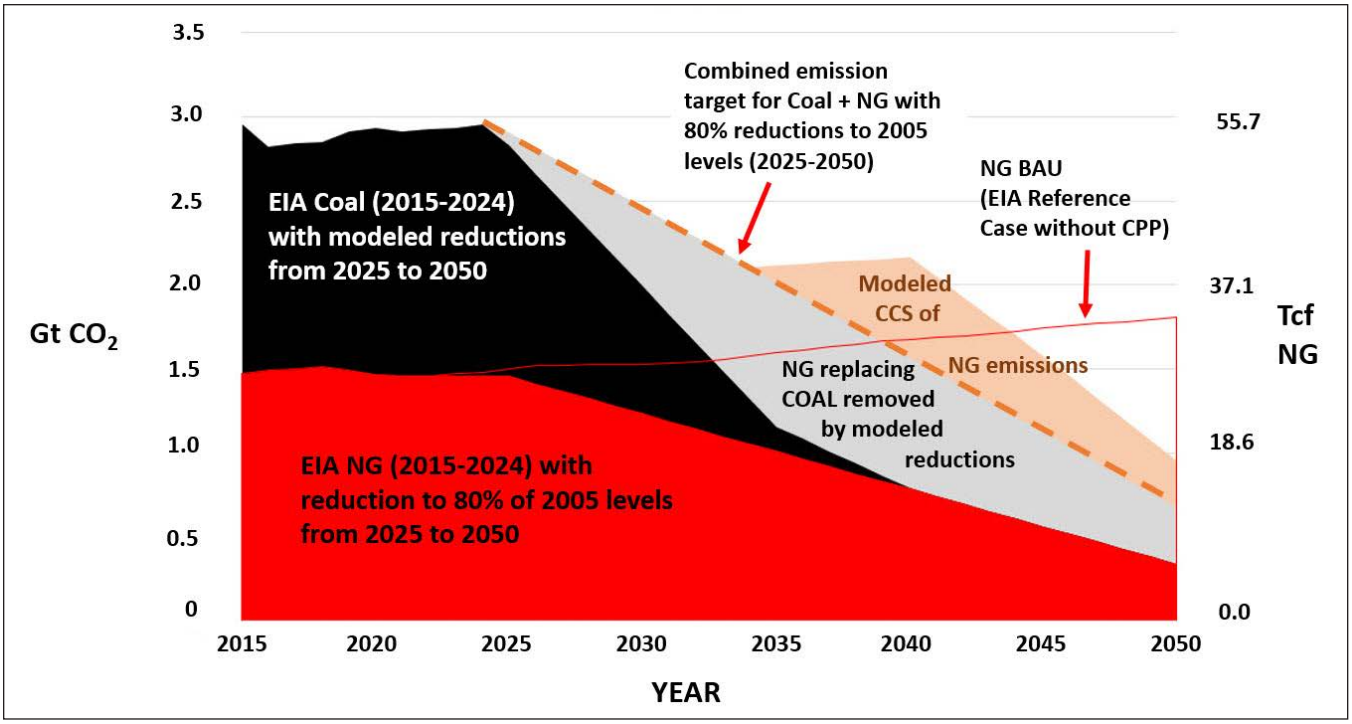


Figure 1. *Figure graphically illustrates the relative CO_2 emissions (in gigatonnes [Gt]) and consumption of natural gas (NG) and coal within the United States from 2015 until 2050 under the scenario proposed in Rine (2019a). Emissions levels between 2015 to 2024 are based on US Energy Information Administration (2017) projections without the Clean Power Plan (CPP). Emission reductions starting in 2025 reach 20% of 2005 levels by 2050. This scenario incorporates early termination of coal usage and utilization of carbon capture and storage (CCS) based on the Citizens' Climate Lobby (2014) model (**Figure 2**) but extrapolated to 2050. The NG emissions sequestered by CCS (pale orange) are not tallied with the total allowable emissions. From Rine (2019a).*

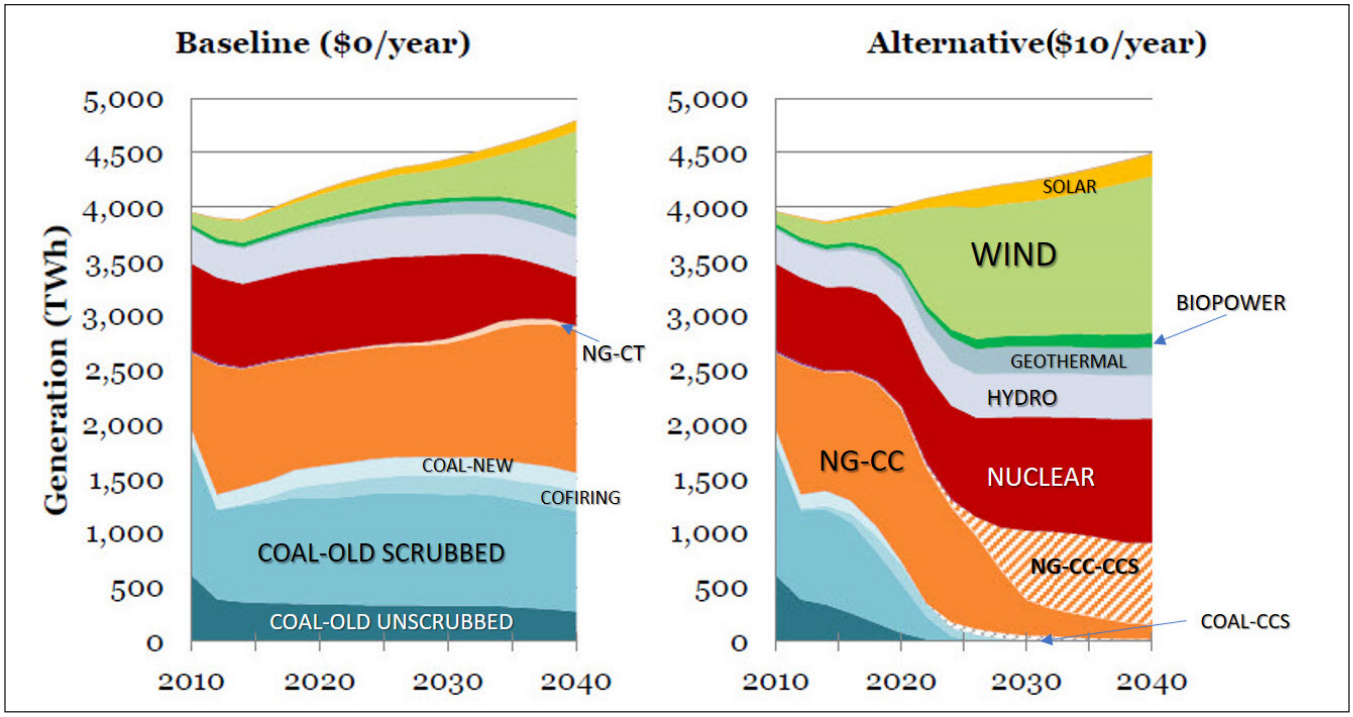


Figure 2. *Citizens' Climate Lobby (2014) modeled United States electrical power generation for the period between 2010 to 2040 without a carbon tax (baseline [$0/yr]) and with a carbon tax (alternative [$10/yr]). The alternative modeled a carbon tax starting at $10/t CO_2 in 2015 and increasing $10/t annually until 2035. The Citizens' Climate Lobby (2014) model replaces NG combined cycle (NG-CC) with NG CCS. Figures are modified from Citizens' Climate Lobby (2014). NG-CT = combustion turbine. From Rine (2019a).*

for 2025 to 2050 (~130%) is a fraction of the growth necessary to replace fossil fuel usage by 2050. Other studies of past growth in renewable energy calculated that between 2004 and 2010 there was a growth of approximately 300%. Assuming the EIA projected growth through 2024 is correct (~160% from 2015 to 2024), growth in renewable energy would have to exceed 700% from 2025 to 2050 to completely replace energy produced from NG and coal. This unprecedented growth requirement indicates there will be continued need for energy from NG during this period. The competitiveness of commercial- or municipal-scale battery storage versus NG powered peaking plants is difficult to predict because of the large variability in both the levelized costs of energy from gas peaking plants and storage costs for batteries. Present-day estimates for low-cost battery storage could replace high-cost NG peaking plants immediately after instituting a CFD plan. Whereas a low-cost NG peaking plant may still be competitive decades after the initiation of an annually increasing carbon fee. ■

References Cited

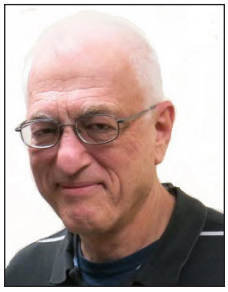
Citizens' Climate Lobby, 2014, The economic, climate, fiscal, power, and demographic impact of a national fee-and-dividend carbon tax, accessed March 14, 2019, https://citizensclimatelobby.org/remi-report/.

Rine, J.M., 2019a, How action on climate change could benefit US natural gas producers, but not without federal mandates, AAPG Bulletin (archives, ahead of print).

Rine, J.M., 2019b, How a Carbon Tax Could Benefit US NG Producers, But How Much and for How Long?, AAPG Annual Convention and Exhibition (ACE 2019), San Antonio, TX, poster presentation, accessed December 18, 2019, http://www.searchanddiscovery.com/pdfz/documents/2019/42392rine/ndx_rine.pdf.html

US Energy Information Administration, 2017, Annual energy outlook 2017 with projections to 2050, accessed December 18, 2019, https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf.

Biographical Sketch



James (Jim) M. Rine earned a PhD in 1980 at the University of Miami where his research on modern shallow marine siliciclastic muds received the 1985 SEPM outstanding paper award with R. N. Ginsburg. Rine's other published research includes shallow marine and deltaic sedimentation, groundwater hydrogeology, porosity characteristics of siliciclastic mud rocks, and the relationship of the petroleum industry to climate change. Jim, who currently is an adjunct professor within the Department of Geology at Wayne State University, has spoken numerous times to HGS over the past three decades.

Wednesday, March 11, 2020

New Location: Craft Republic Houston • 11470 Westheimer Rd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

New 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.

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David Bardsley, PG
Ellingson-DTD
david@horizonaldrill.com

Horizontal Well Used for Coal Ash Basin Dewatering

Coal combustion residuals (CCRs), or coal ash, are a byproduct of burning coal. The ash has a variety of constituents including silicon, iron, and aluminum oxides along with trace amounts of heavy metals such as arsenic, selenium, mercury, boron, and chromium. Power plants are the main generator of CCRs and normally the ash is beneficially used or stored onsite in landfills or impoundments.

According to the Environmental Protection Agency, there are over 1,000 active coal ash sites in the United States. Many coal ash basins will require dewatering before remediation and/or closure activities can occur. This presentation details the design, construction, and results of a 650-foot long dewatering well installed in a 9-acre closed ash basin using horizontal directional drilling methods. The CCR materials at the site were characterized as fly ash (10 – 100 µm) and bottom ash (5 – 38 mm). Design challenges included well screen and casing selection and drilling/installation methodology. Well installation challenges included geometry of the landfill and unexpected site conditions encountered during well completion.

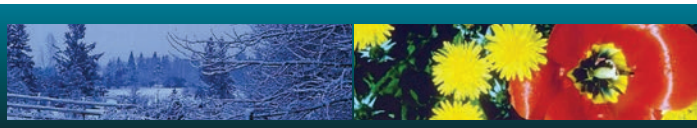
Once installed, the horizontal well performed better than anticipated. The level of water in the basin was drawn down by ~18 feet in less than four months and CCR-related constituents in the surrounding groundwater declined considerably. ■

Biographical Sketch

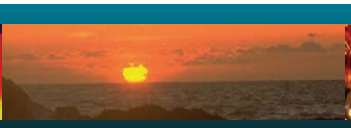
David Bardsley P.G. has over thirty-five years of environmental drilling experience working in a variety of settings across the United States. Mr. Bardsley earned a Bachelor of Science degree in Geology and Geophysics along with a Communications Minor (1984) from the University of Missouri-Rolla. He started his career as a drill rig helper advancing through various technical and managerial positions in both small and large drilling companies. He was an early leader in the use of horizontal drilling to solve environmental and water supply challenges and has authored/co-authored over twenty papers on horizontal environmental drilling methodology. David has been directly involved in the design and oversight for the installation of hundreds of horizontal environmental and water supply wells.

He is a licensed well driller in Texas, Arizona and Louisiana and holds RG/PG certifications in Texas, Missouri, Louisiana and Tennessee. Mr. Bardsley is a strong proponent of education and has served as a short course instructor at Battelle environmental conferences and University of Wisconsin Madison along with presenting environmental drilling training to students at University of Arizona and University of Louisiana Lafayette.

February 2020



Sunday	Monday	Tuesday	Wednesday
	Reservations: The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail office@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event**. If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**		
2	3	4	5
9	10 **HGS General Dinner Meeting** *"Scholarship Night," Astronaut Jessica Watkin, Page 7*	11 **HGS Board Meeting** *6 p.m.*	12 **HGS Environmental & Engineeering Dinner Meeting** *"Three Paleo Human Mysteries," Neil Bockoven, PhD, Page 9*
16	17	18	19
23	24 **HGS International Dinner Meeting** *"Tectonic Evolution, Hydrocarbon Potential and Play Prospectivity of the Deep-water Yucatan Margin, Southern Gulf of Mexicos," Jack Kenning Page 11*	25	26 **HGS General Luncheon Meeting** *"How Hot is the Kitchen? Hydrocarbon Migration Tomography," Rudy Wilhelm, Page 15* **NeoGeos GeoTrivia Night** *Liberty Station, 7 p.m., Page 8*



GeoEvents

Thursday Friday Saturday

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	**Don't wait, make your reservations online at hgs.org**	**1**
6	**7**	**8**
13	**14**	**15** **Annual Volunteer Day at YMCA Camp Cullen** *Page 2*
20	**21**	**22**
27	**28**	**29**

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

March 9 – 13, 2020
CERAWeek
Houston, Texas, USA

April 17, 2020
HGS Shrimp Peel & Crawfish Boil
Houston, Texas, USA, Page 10

April 25, 2020
HGS Tennis Tournament
Houston, Texas, USA, Page 12

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

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

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

September 15-16, 2020
2020 HGS-PESGB Africa Conference
Houston, Texas, USA, Page 14

November 19-20, 2020
Second EAGE/HGS Conference on Latin America
Cartgena, Colombia, Page 8

Why I Do Volunteer Work for Houston Geological Society

Janet Combes

What inspired you to become a volunteer for the Society?

I am a strong supporter and longtime believer in encouraging science in children's activities – the museum committee and the start-up of Earth Science Week were the first of many HGS projects I got involved in. I also like to share what I have learned and learn from others. I have participated in conventions and HGS meetings in organizing and in giving presentations.

In what way did you find your volunteering experiences rewarding and meaningful for you and for the community that we live in?

When I am at children's activities, the grins, the energy, the enthusiasm, the questions and discussions are invigorating and reinforce my love of the science. I often get asked if I work at the museum while I am volunteering – and I say "Yes, but I get paid in grins." When I am at professional meetings, training courses or conventions, the dynamics of sharing information and getting new ideas from discussions is stimulating. And to quote John Tubb "I would encourage all members to volunteer for HGS activities. Throughout the ups and downs in our industry, the HGS has been steadfast in its dedication to the geoscience community and this has largely been due to the passion of our volunteers."

When did you join the HGS? What are some of the committees that you have worked on and/or Board positions that you have held? What other professional societies are you a member of?

I joined the HGS when I moved to Houston in 1995, transferred from Amoco Tulsa Research to a Houston Exploration group.

Over time my volunteer activities with the HGS included:

- 1997-2019 HGS Museum of Natural Science Committee volunteer guide
- 1999-2001 Earth Science Week Committee logistics co-Chair
- 2000 Coalbed Methane short course: case study presentation
- 2002-2004 Director of the Board
- 2003-2010 Northsider's Committee initiator / member
- 2003 and 2005 CAST (Science Teachers of Texas annual conference) HGS Chair/co-Chair
- 2001-2019 Earth Science Week Committee
- 2004-2019 HGS outreach booth at HGMS show Chair
- 2010-2019 HGS outreach booth at Sally Ride Festival Chair

HGS does a lot to support and recognize volunteer efforts. Awards, great and small, give me good feelings. The HGS has honored me with awards during my membership:

- 2001 Rising Star Award
- 2006 and 2010 President's Award
- February 2006 Volunteer of the Month
- 2008 Distinguished Service Award
- 2016 Honorary Lifetime Member

In 2003 I received the Texas Earth Science Teachers Association Recognition award. The ECH (Engineering, Science, & Technology Council) awarded me the Excellence in Education award in 2007.

I am a member of other professional societies: AAPG, SIPES, SEG, SEPM, AWG, and GSA. Some of my volunteer efforts with these groups include:

- 1991 GSA Annual Meeting session co-chair
- 1993 SEPM-GCS 14th Annual Research Conference Program Advisory Committee
- 1993-1995 SEPM Building & Headquarters committee
- 1993 & 1998 Petroleum Research Fund proposal reviewer
- 1994 SEPM Executive Director Search chair
- 1995 GSA Annual Meeting abstract reviewer
- 1995 & 2006 AAPG Convention session co-chair
- 1996: Organizing Committee/session chair: International Mining Technology Symposium: Coalbed Methane Development & Application, Xian, China
- 1997-1999 GSA Editor, Sedimentary Geology Division newsletter
- 1998 SEPM Nominations
- 1999-2002 AAPG House of Delegates
- 2007-2009 Thesis committee for University of Houston M.Sc. geology student
- 2008 GCAGS/GSA Houston planning committee – chair, Teachers events.

I have judged science fairs: 1992-1994 Tulsa Monte Cassino School; 1993-1994 Tulsa Science/Engineering Fair judging committee chair; 1994 national science fair; 1998-99 & 2004-06 Houston Science/Engineering Fair. I have judged many convention sessions: AAPG Annual Conventions – 1991, 1992, 1993, 1994, 1999; GSA – 1991 Annual Meeting; and 1992 SEPM Mid-Year Conference.

I have presented multiple talks at various conventions and one for teachers – Earth Science Leadership Institute, Denver Earth Science Project, Tulsa in 1994. I have published 21 abstracts from presentations, 22 papers or extended abstracts as author or co-author, 11 in-house Amoco publications as co-author.

Where did you grow up? What made you decide to become a geologist? Are you the only geoscientist in your family?
I grew up in New Orleans, attended the oldest girls school in the United States and lived a block from the Mississippi River. I started collecting rocks about first grade. Growing up in New Orleans, rock collecting was hard to do as the only rocks were the gravel pits for road construction. However, my grandparents lived in the Missouri Ozarks and I would focus on the rocks on every summer visit. Over the years on summer vacations, my parents drove us from the Rockies to the Appalachians to Florida and to the Ozarks – and I remember staring out the windows at all those rocks! A great-uncle was a rock hound and he started giving me rocks he found. In school, I liked science, although geology wasn't offered. My father worked for Chevron as a drilling engineer, so I was familiar with the fact that geologists could get jobs.

I am the only geoscientist in a family with 3 drilling engineers, 1 chemical engineer, 1 bio-chemical engineer, 1 aeronautical engineer, 1 transportation engineer, and 1 chemical engineer in college – out of 5 siblings and 5 in-laws and 9 nieces and nephews.

What universities did you attend? Where did you do your college field work?
I attended Louisiana State University for my BSc in geology in 1970-1973. LSU college field camp was in Colorado, just south of Colorado Springs. The students organized carpools to drive all that way and then the camp started out slow on the hikes since everyone had to adjust to the altitude. There was one cabin off to one side that was for the girls – females had only been allowed at camp for a few years.

I attended the University of Houston, 1975-1978, for a MS in geophysics. I worked in the industry while I was getting my MS and on until 1984, when I went to the University of Texas Austin for a PhD in geology (1990). My dissertation was Depositional Systems and Tectonic/Eustatic History of the Oligocene Vicksburg Episode of the Northern Gulf Coast. The sequence stratigraphy approach was first published during this time.

What is your favorite college or early career experience/story?
When I started LSU in the fall of 1970, I had about half the funding for tuition and room and board from an Alumni Fellowship Scholarship. I applied for a geology department scholarship to make up the difference. Although my dad was a petroleum engineer, I am the oldest of six children and I wanted to take care of as much of the cost as possible. I was told – sorry, all the geology scholarships are for "young men in the science". Oh, well. However, that semester one company, Pennzoil United, changed the wording by removing the male requirement and the geology department reassigned various scholarships so that the Pennzoil funding was available for me. I was really happy then and looking back that was a big step for a conservative southern school to open the door for a female geologist in 1971!

Number of years in the industry? What countries has your career taken you to?
My first summer job was in 1973, then I started graduate school after that summer and put it off for a couple of years. In the meantime, I had contract work for the Louisiana Mineral Board and the USGS in Baton Rouge. When I moved to Houston in 1975, I started a full-time career and enrolled at University of Houston night classes to get a MS in geophysics. I worked in the industry for six years after getting my MS, then while I was working on my PhD I had jobs as a teaching assistant, as a technologist and summer jobs throughout my PhD time. After getting my PhD, I worked a year for the Kansas Geological Survey in hydrogeology, then returned to the industry working for several companies, then as a consultant for an overall total of about 45 years. I have worked projects from every continent except Antarctica – mostly from Houston on computers. I have been across the USA and to China, Canada, and Mexico.

What part about being a geologist brings you the most joy? In your opinion, what has been the best/most interesting technological advancement within the geoscience industry?
I think of the interpretation process, integrating geological and geophysical information, as solving 4-D puzzles! This is exciting and joyful. Drilling a successful well really makes it great. The BEST technological advances have involved 3D seismic and all the fancy processing and attribute analyses, computer interpretation and mapping, the ongoing development of AI work.

What is the coolest/ most unique rock or mineral in your personal collection?
My favorite rock is one of the first fossils I collected – a crinoid stem piece in chert from Flat Creek in the Missouri Ozarks. I remember finding it in the gravel bar and putting it in the middle of the picnic blanket and when we were packing up to go back to town, someone shook out the blanket. I refused to leave until we found my fossil… ■

HGS Welcomes New Members

New Members Effective January 2020

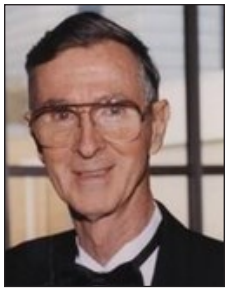
EMERITUS MEMBERS
Mark McCuen
Eric Yerkovitch

STUDENT MEMBERS
Kyungho Jeon

Welcome New Members

Remembrance

Sabin W. Marshall
1928-2020

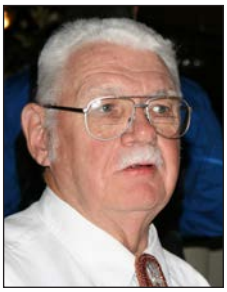


Sabin William Marshall passed away peacefully in his sleep during the early morning hours of Wednesday January 8, 2020. Sabin was born on October 15, 1928 in Houston, attended Lamar High School and was a proud graduate of The University of Texas at Austin with BS in Geology, class of 1952. He enjoyed a long career as a geologist with Texas Gas Transmission and was an active member of the Houston Geological Society, serving as its President in 1975. Following an European tour of duty with the US Army, Sabin married the love of his life, Mary, in 1958 and together they raised four children. Sabin and Mary were founding members of St. Thomas More Catholic Church, where he served as an usher for many years. Sabin was a devoted family man, playing catch in the backyard, coaching little league, taking us to Astros games in the Dome, Indian Guides, and serving as a Scoutmaster. He taught us about fairness, doing the right thing, paying yourself first but always making room for charity, and having compassion for others. Sabin loved the outdoors and travel, taking the whole family on a tour of the country by car every year with the trusty pop up camper in tow. Sometimes we all got along. Other times we didn't, but what an experience, what a gift he gave us. Yellowstone, the Dakotas, Grand Canyon, Monticello, Mt. Vernon, Colorado, New York City, the KOA in Phoenix, and last but not least, driving from Houston to San Francisco and back. His fondness for camping didn't rub off on his children in adulthood but we're all grateful for the opportunities he gave us – to see the country, to meet people different from ourselves and experience things we weren't used to; scary but wonderful at the same time. Life is like that. He knew that long before we did, but he had the wisdom to let us find it for ourselves. The gift a father gives his children. Sabin was predeceased by Mary, his wife of 59 years. He was survived by their four children, six grandchildren, and one step-granddaughter. ■

Summarized from the Life Tributes section of the Houston Chronicle published on January 12, 2020

Remembrance

Christopher C. Mathewson, PhD, PE, PG
1941-2020



Dr. Christopher C. Mathewson died on the evening of January 21, 2020 at his home in College Station, Texas. He was 78 years old. Chris was a Regents Professor Emeritus in the Department of Geology & Geophysics at Texas A&M University. Upon receiving his doctorate in geological engineering, Chris began his career at Texas A&M in 1971 where he remained for more than forty years specializing in engineering geology. Chris developed the engineering geology program at Texas A&M which at one time was the largest such program in the world. Even though Chris did not attend Texas A&M as a student, he was an Aggie through and through and received several awards and honors from the university.

Chris received his BS in Civil Engineering in 1963 from Case Institute of Technology, his MS in Geological Engineering in 1965 from the University of Arizona, and his PhD in Geological Engineering from the University of Arizona in 1971.

In addition to his teaching duties at the university, Chris was involved in research and development projects related to applied geology and the protection of health, safety, and well-being. As an example, his research of the impact of surface coal mining on groundwater contributed to environmental protection activities employed by the mining industry. Chris presented over 400 papers, published over 90 technical papers, and edited four technical volumes. He authored a textbook on engineering geology.

In addition to his duties at Texas A&M, Chris was a practicing geologist and engineer. He was licensed in both geology and engineering in Texas as well as in several other states. He consulted on myriad projects in both engineering and geology.

Chris was one of the early driving forces for licensure of geoscientists in Texas and he worked diligently for many years for passage of the Texas Geoscience Practice Act which was enacted in 2001. In 2012, Chris was appointed to the Texas State Board of Professional Geoscientists by Governor Rick Perry and he served there through 2017.

Chris was a longtime member of several professional organizations which included the Association of Environmental and Engineering Geologists, the American Association of Petroleum Geologists, the American Geophysical Union, the American Institute of Mining, Metallurgical and Petroleum Engineers, the American Institute of Professional Geologists, and the American Society of Civil Engineers. He was a Life Member and Fellow of the Society of American Military Engineers, a Fellow of the Geological Society of America, and a Life Member of the American Society of Civil Engineers. He was past president for both the American Geoscience Institute and the Association of Environmental and Engineering Geologists. For the latter organization, he served as the editor of its bulletin from 1981 to 1987. He served in the National Association of State Boards of Geology (ASBOG) where he was a subject matter expert in the organization's Council of Examiners and where he developed the fundamentals of geology component of the national geologist licensure examination.

Over the years, Chris received many honors and awards for his professional and educational activities. During his time at A&M, he received several awards and honors from the university. In 2006, he was named a Regents Professor by the Texas A&M Board of Regents. In the same year, Chris was given the Robert C. Runnels Excellence in Advising Award by the College of Geosciences. In 1986, he received the Faculty Distinguished Achievement Award in Teaching from The Association of Former Students of Texas A&M University.

Remembrance *continued on page 26*

Remembrance continued from page 25

His service in professional organizations garnered him the Floyd T. Johnston Service Award in 1995 from the Association of Environmental and Engineering Geologists, the Karl and Ruth Terzaghi Outstanding Mentor Award from the Association of Environmental and Engineering Geologists in 2008, the Pete Henley Mentor Award from the Texas section of the Association of Environmental and Engineering Geologists in 2007, the Charles R. Sherman Award from the National Association of State Boards of Geology in 2011, and the James Hutton Lifetime Service Award from the National Association of State Boards of Geology in 2019. For his textbook Engineering Geology, the Association of Environmental and Engineering Geologists awarded him the Claire P. Holdredge Award. Marquis Who's Who presented Chris with the Albert Nelson Marquis Lifetime Achievement Award in 2019.

The Association of Environmental and Engineering Geologists Texas Section Scholarship Fund introduced a scholarship named after Chris in 2011. This scholarship is awarded to outstanding students who demonstrate ability, potential, contribution, character, and participation in environmental and engineering geology.

After retirement as a professor at Texas A&M, Chris remained active in teaching courses for various agencies through the Texas A&M Engineering Extension Service. In January of 2019, Chris taught a two-day course on Groundwater Hydrogeology as a fundraiser for the Houston Geological Society. This course was an example of his generosity and dedication to the geoscience profession since he did not charge for his time and effort.

Chris taught thousands of undergraduate and graduate students during his time at Texas A&M and was responsible for a host of them becoming geoscientists. He had a heart of gold which is reflected by the great love that his former students have for him. He was an educator supreme who will not be forgotten. His many colleagues, friends, and former students will miss him greatly.

Chris is survived by his wife Janet, daughter Heather, son and daughter-in-law Glenn and Jennifer, and three grandchildren. A funeral service was scheduled for Chris on January 30, 2020 at 1:00 pm at A&M United Methodist Church, 417 University Drive, College Station, Texas. A Life Celebration reception followed at 2:00 pm at the church. ■

After the successful introduction of Geo Trivia Night in 2019, the NeoGeos will be starting the Spring Season in late February and continue through May for a total of four events. Geo Trivia Night was started to refresh the ever so common Happy Hour by introducing an event that brings together geoscientists for some good drinks, great conversations, and some healthy competition. The committee has viewed this event as a team-building opportunity for company geoscience departments as well as an opportunity for Houston geoscientists to network. Please come to join us on Wednesday, February 26th, 7pm – 9pm.

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.

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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.**

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Qualifications for Active Membership

1) Have a degree in geology or an allied geoscience from an accredited college or university; or
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Qualifications for Associate Membership (including students)

1) Be involved in the application of the earth or allied sciences.
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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.

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