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Not So Boring Anymore**
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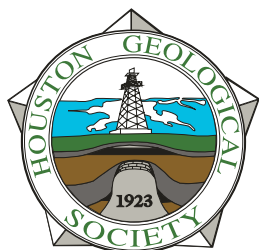
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The Bulletin

Houston Geological Society

Volume 68, Number 1

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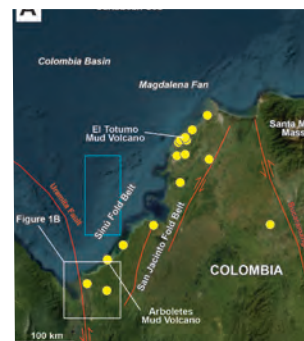
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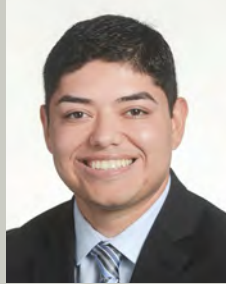
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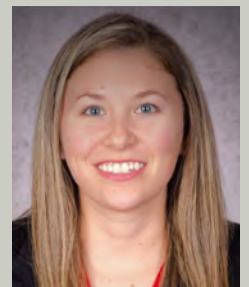
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Patty walker, HGS President 2025-26
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Let Me Introduce Myself

It is a true honor to write to you as President of HGS and to welcome everyone to what promises to be an exciting new year for our society. I look forward to connecting with more of our members, hearing your experiences across the industry, and learning how HGS can continue to be a partner in your career journey.

WHO IS YOUR NEW PRESIDENT

As I get to know each of you, I'd like to share a bit about my own path in geoscience. I graduated from Oklahoma State University in 1986 with both a bachelor's and master's degree from the Boone Pickens School of Geology.

My career began at ExxonMobil in Houston as a production geologist, followed by several exploration assignments. From 1997–2004, I worked as an independent consultant, providing asset evaluations for multiple companies, before rejoining ExxonMobil in 2004. Over the years, I was fortunate to work on diverse energy projects in technical and management roles that took me across six continents.

In 2013, I was named a senior principal geoscientist in upstream, and in 2015, promoted to chief geoscientist. After retiring in 2020, I remained active in the professional community through the American Association of Petroleum Geologists, serving in the House of Delegates and as a Trustee Associate of the AAPG Foundation. At HGS, I have previously served as Vice President and continue to contribute on the Finance Committee.

WHY PROFESSIONAL SOCIETIES MATTER

Throughout my career, I have often been asked by younger professionals whether it's worth investing time in professional societies like HGS. Their concern was always the same: with time in such short supply, where is the value?

My answer comes from my own experience. As a student at Oklahoma State, I was introduced to the value of professional societies by alumnus Herb Davis, who was deeply involved in the Oklahoma City Geological Society. He often sponsored students to attend luncheons and technical talks, emphasizing

the importance of building networks beyond one's employer or alumni circle. Just as importantly, he modeled the principle of paying it forward to the next generation. That lesson has stayed with me, and it's one I hope to inspire in all our members.

In today's rapidly evolving work environment—shaped by flexible schedules, frequent mergers, and emerging industries that rely on geoscience skills—the importance of strong networks has never been greater. HGS provides those opportunities: networking, mentoring, and technical training. I believe our society is uniquely positioned to meet these needs for our members.

This is your society, and I welcome your feedback and active participation. It only functions because of the volunteer efforts of all of you, assisted by our office staff.

*HGS provides those
opportunities:
networking, mentoring,
and technical training.*

GRATITUDE TO OUTGOING HGS LEADERS

I would like to extend my heartfelt thanks to our outgoing board members for their dedication and service.

- **President:** Penny Patterson, who kept HGS on a positive trajectory and leaves the society stronger than ever.
- **Vice President:** Catie Donahue, whose leadership in organizing the technical program and the joint HGS–GESGB Africa Conference last October was outstanding.
- **Editor:** Ted Godo, who rose to the challenge with distinction, personally contributing 12 articles.
- **Treasurer:** Glen Lowenstein, who provided the board with timely and detailed financial reports, ensuring our fiscal health.
- **Secretary:** Sophie Broun, who diligently documented board activities and helped streamline new membership approvals.
- **Directors:** Judy Schulenberg and Sharma Dronamraju, who strengthened continuing education, scholarship, and social networking efforts.



Lucia Torrado, HGS editor 2024-25
editor@hgs.org

Looking Ahead Together

It's a true honor to serve as editor of the Houston Geological Society *Bulletin*, and I want to begin by expressing my sincere gratitude to the HGS community for the warm welcome and trust. This society has long been a space where geoscientists of all backgrounds come together to share ideas, data, stories, and opportunities, and I'm incredibly proud to contribute to that tradition in this new role.

I'd like to extend my heartfelt thanks to our outgoing editor Ted Godo for his patience, mentorship, and steady encouragement as I step into the role of the HGS *Bulletin* editor. His guidance behind the scenes -always generous and grounded- has made this transition not only possible but truly meaningful. Thank you, Ted, for your support and participation in this publication.

ABOUT THE EDITOR

I would like to take this opportunity to briefly introduce myself. My name is Lucia Torrado, and I am a geologist originally from Colombia. After earning my B.Sc. in Geology in 2008 from the National University of Colombia and working for two years at Hocol, a subsidiary of the state-owned company Ecopetrol, I came to Houston to pursue graduate studies. I completed my master's and Ph.D. with the CBTH consortium at the University of Houston (you can read more about this in the Feature Article). My research focused on regional evaluation in the Caribbean and Equatorial Atlantic Margin, and I am currently an independent geoscientist seeking new opportunities.

While being a research assistant with the CBTH, I became a student member of the major geoscience societies, including the Houston Geological Society. Over time, I transitioned into an active membership, and over the years, I've served as an HGS volunteer, as secretary, and now have the honor of serving as editor of the *Bulletin*.

ENGAGING THE NEXT GENERATION WHILE HONORING EXPERIENCE

As I mentioned before, I first joined the HGS as a student who benefited from a free membership. What kept me involved,

however, was the opportunity to give back through volunteering. Not every student continues their involvement after graduation, and despite the dedicated efforts of groups like the NeoGeos, our younger demographic remains relatively small. In her first editor's letter, Caroline Wachtman included membership statistics that, I suspect, have not changed much since. This isn't unique to our society, it's a broader trend in professional organizations around the world. As our industry evolves, so too must our efforts to engage the next generation.

I encourage you to reach out to younger geoscientists and students—invite them to join, volunteer, and engage with HGS. Through the *Bulletin*, we aim to highlight the achievements of

younger professionals while also featuring the wisdom and experiences of our more seasoned members. By combining fresh perspectives with the depth of experience in our community, we can strengthen the HGS for years to come. My hope with the *Bulletin* is that we continue to foster a space not just for technical excellence, but also for mentorship, dialogue, and inclusion across all experience levels and backgrounds.

*the HGS Bulletin thrives
on the contributions
of its members.*

NEW AND RETURNING FEATURES IN THE BULLETIN

I will be bringing back the Pivot Profile series that former HGS *Bulletin* editor Caroline Wachtman created in her 2023-2024 term. The Pivot Profile spotlights geoscientists who have taken their technical training in new and unexpected directions, where these stories remind us that geoscience is not a fixed path: it's a foundation that can lead to innovation across industries.

I'm also introducing a new -and hopefully fun- section: Rock-Solid Guess (yes... pun intended!). Each month, we'll share an image and challenge you to interpret or identify what you're seeing. Think of it as a playful test of pattern recognition, curiosity, and your sense of discovery. You'll also continue to see Word Breccia, the word scramble puzzle that has become a staple of the HGS *Bulletin*: one that I admittedly used to spend far more time than I should trying to solve! Now that the roles are reversed, I hope you enjoy tackling it as much as I've enjoyed putting it together.

From the President

On behalf of HGS, I thank each of you for your hard work and dedication this past year.

GOALS FOR THE YEAR AHEAD

Our long-term goals span many presidents and boards, and consistency is key. We will continue to build on recent progress in four critical areas:

1. Financial stability and health.
2. Growing membership, particularly among early- and mid-career professionals.
3. Delivering an engaging technical program and continuing education opportunities.

4. Expanding opportunities for networking and volunteer involvement.

In addition, this year we will launch a long-awaited redesign of the HGS website. Modernizing our 15-year-old platform will greatly improve communication, event registration, and access to information. I look forward to sharing updates soon on this exciting milestone.

I am honored to serve as your President and look forward to seeing you at HGS events throughout the year. Together, we will continue to strengthen our society and our profession. ■

From the Editor

Finally, the HGS *Bulletin* thrives on the contributions of its members. Technical articles remain the backbone of the publication, keeping our community informed and connected to the latest developments in geoscience. At the same time, personal reflections, career stories, and insights from your own experiences add depth and perspective. By sharing your work, you help make the *Bulletin* a dynamic platform for a highly engaged technical audience and play an essential role in keeping our community vibrant and connected.

IN THIS ISSUE OF THE BULLETIN

The “Los Aburridos” Mud Volcano in Colombia

The Technical Article on the eruption of Los Aburridos mud volcano -located in my home country of Colombia- was inspired by my years in the CBTH consortium, where the Caribbean Plate remains a focus of regional studies and its connection to petroleum system processes. The article explores the eruption's implications for methane presence and potentially underexplored hydrocarbon systems in the northern South American margin. In fact, the inspiration extended to this month's cover: a Google Earth image of the Caribbean region. If you look closely, the answer to “Rock-Solid Guess” can also be found in the photo.

The CBTH Consortium: Honoring Two Decades of Regional Discovery

This year marks the 20th anniversary of the Conjugate Basins, Tectonics, and Hydrocarbons (CBTH) consortium, a program that has played a defining role in the academic and professional journeys of many geoscientists, myself included. With the CBTH, I gained invaluable exposure to regional basin analysis,

collaboration, and mentorship. So, it is with deep gratitude that I help commemorate the CBTH's legacy in this issue's Feature Article. Telling its story feels both like a tribute to a remarkable research initiative and a personal honor.

Pivot Profile: A TED Talk with Ted Godo

Who better to interview for the first issue of this new year, than Ted Godo, our outgoing editor? You can read the story of Ted's career from an impressive 45+ years as an oil and gas leader to starting up a consultant company— Geodog, in Pivot Profile. This interview highlights the skills geologists need to excel in starting a company, and Ted also recounts the pivotal moment that shaped the rest of his career.

2025 Student Expo Preview

The Student Expo Committee is excited to announce that the student poster session is returning this year! In this committee update, we highlight the growth of the Student Expo since its inception and how the event has evolved around the students' needs.

2025 Summer Intern Visits at the Houston Museum of Natural Science (HMNS)

Dorene West (Science Fair Committee Chair) and Penny Patterson (2024-2025 HGS President) visited four interns at the HMNS who were sponsored by the HGS. The visits included live demonstration of OpenSpace's interactive data visualization software and all of the interesting work that the intern did over the summer. ■



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“Los Aburridos” Mud Volcano of Colombia: Not So Boring Anymore

By Lucía Torrado, AGI Exploration LLC

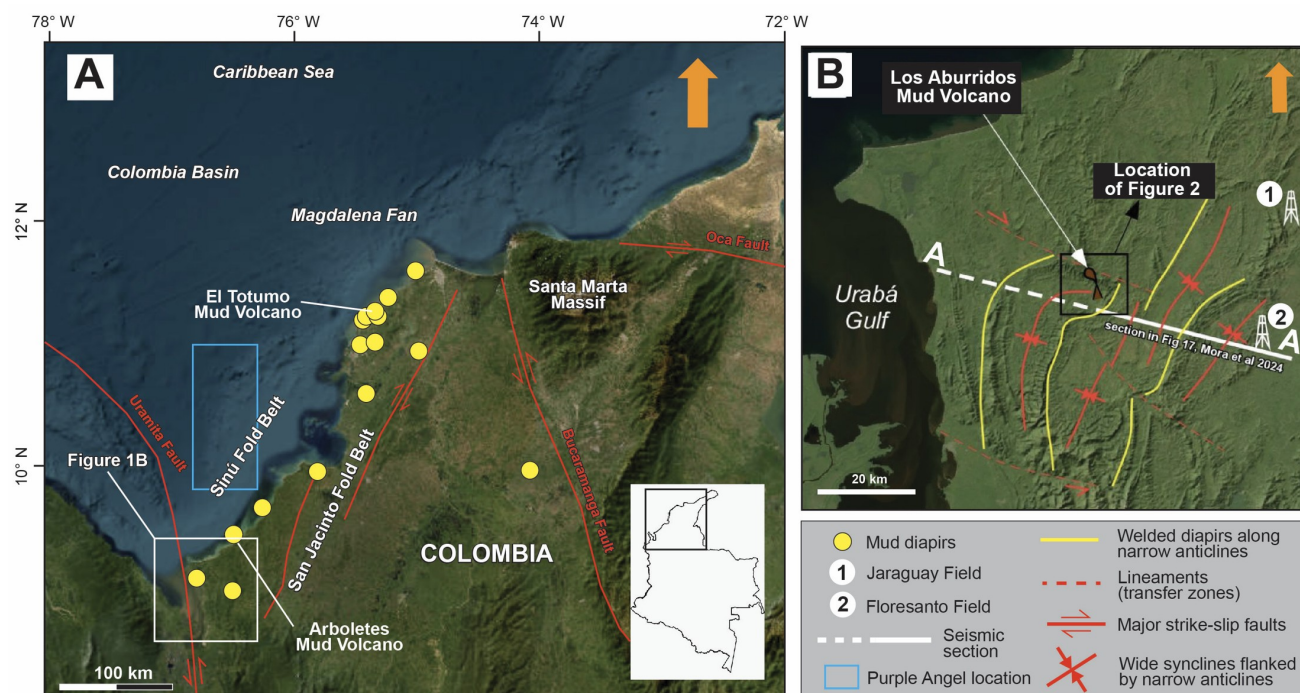


Figure 1. Location map of (A) most well-known mud volcanoes in the Caribbean coast of Colombia and (B) Los Aburridos (San José de Mulatos or Cacahual) mud volcano in the Urabá region of Colombia in the Sinú Fold Belt (modified from Mora-Bohórquez, personal communication, July 2025).

1. INTRODUCTION: MUD VOLCANOES IN THE CARIBBEAN CONTEXT

Mud volcanoes are prominent features across the Caribbean Plate, particularly along tectonically active margins where thick Cenozoic marine sedimentary sequences are subjected to intense compaction and overpressure (López-Ramos et al., 2022). Their formation is associated with fluid overpressure in fine-grained sediments, leading to the mobilization of mud and methane through faults and fractures. Diapirism in this region is driven by the expulsion of over-pressured pore fluids (primarily methane) generated during the microbial degradation of organic matter in the basin's shale-rich formations. These fluids, under confined conditions, find vertical escape paths along faults, triggering episodic eruptions (López-Ramos et al., 2022).

These features are notably prevalent in areas such as Trinidad and Tobago, the southern Caribbean margin of Venezuela, and Colombia's Caribbean coast, where they reflect dynamic tectono-sedimentary conditions. In Colombia, over 100 mud volcanoes have been documented (López-Ramos et al., 2022), forming part of a larger accretionary wedge complex influenced by the subduction of the Caribbean Plate beneath the South American Plate (Rodríguez, et al., 2021).

This paper reviews the geological framework of Los Aburridos

(“The Boring Ones” in English) mud volcano in the Urabá region of Colombia, recounts the latest eruption in November 11 of 2024, and discusses implications for hydrocarbon exploration in northwestern Colombia. While this study addresses selected aspects of mud diapirism along the convergent northwestern margin of Colombia, significant work remains to fully understand the origin of this phenomenon, its structural controls, and the hydrocarbon potential of mud diapir-associated plays in the southern sector of the Sinú Fold Belt.

2. GEOLOGIC SETTING OF LOS ABURRIDOS VOLCANO

Los Aburridos mud volcano (also known as San José de Mulatos or Cacahual) is located south of the Sinú Fold Belt (SFB), ~30 km west of the Jaraguay oil field, and lies within a structurally complex zone along the Urabá Basin of Colombia (Figure 1). Along with the South Caribbean Deformed Belt (SCDB), and the San Jacinto Fold Belt (SJFB), the SFB is part of system of accretionary prism developed during the oblique convergence between the Caribbean and South American plates, characterized by a combination of strike-slip motion, thrusting, and transpressional deformation (Mora-Bohórquez et al., 2024; Rodríguez, et al., 2021). High pore-fluid pressures generated within rapidly deposited Neogene forearc sediments (Figure 2a), contribute to widespread mud diapirism and volcanism throughout the Caribbean margin of Colombia (Mora-Bohórquez et al., 2024).

“Los Aburridos” Mud Volcano

Within this framework, mud volcanoes such as Los Aburridos, El Totumo, Arboletes, and Puerto Escondido (**Figure 1**) align structurally along deep-seated thrusts and transpressional fault systems inherited from Paleogene-Neogene tectonic evolution. These faults act as vertical conduits for over-pressured fluids and fine-grained sediments mobilized from depths of several kilometers (**Figure 2b**). The detachment surfaces associated with these features typically develop within clay-rich Miocene formations, which serve both as source and carrier beds for mud extrusion (**Figure 2b**) (López-Ramos et al., 2022; Rodríguez et al., 2021).

Regionally, mud volcanoes in northern Colombia are categorized into three structural domains based on their position relative to major faults: 1) Footwall of the Sinú Fault; 2) Footwall of the San Jacinto Fault; and 3) Hanging-wall of the San Jacinto Fault. According to López-Ramos et al. (2022), Los Aburridos volcano lies in the San Jacinto Hanging-wall domain, west of the Sinú Fault, where deep-seated Miocene detachments dominate (López-Ramos et al., 2022).

2.1 MUD COMPOSITION OF LOS ABURRIDOS VOLCANO

At Los Aburridos volcano, mineralogical and geochemical

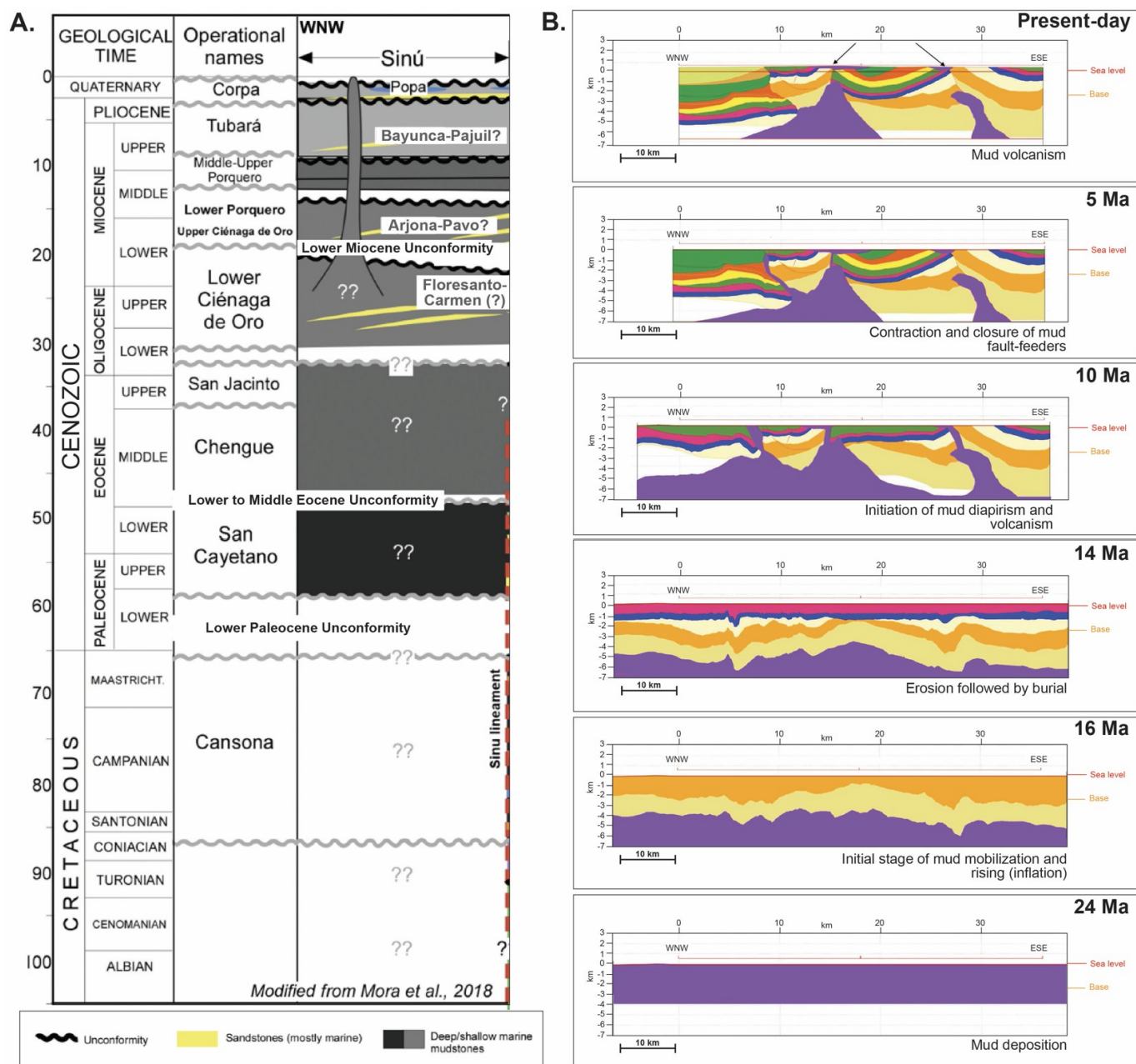


Figure 2. (A) Stratigraphic chart of the Sinú Fold Belt area; and (B) Kinematic reconstructions showing the evolution of mud mobilization, diapirism and volcanism along a structural section located a few kilometers north of Los Aburridos mud volcano (modified from Corredor, personal communication, July of 2025).

“Los Aburridos” Mud Volcano

analyses reveal a dominance of smectitic clays (particularly montmorillonite), with subordinate illite and chlorite (López-Ramos et al., 2022). X-ray diffraction (XRD) analyses of mud samples show a high proportion of smectite, suggesting derivation from fine-grained Miocene units. Geochemical data, including major and trace element concentrations (SiO_2 , Al_2O_3 , TiO_2 , La, and Sc), group Los Aburridos volcano into a compositional family typical of the northern Serranía de San Jacinto, distinct from the Sinú or Tubará zones further to the northeast (López-Moreno et al., 2022).

Detrital zircon U-Pb geochronology constrains the origin of the extruded material of Los Aburridos volcano to the Miocene, consistent with deep-sourced mobilization. The zircon ages obtained in Los Aburridos mud volcano (74 Ma single peak), seem to correspond to a particular zircon enrichment event (López-Ramos et al., 2022). Outcrop samples around Los Aburridos mud volcano from Lower-to-Middle-Miocene age of the Campano, Pavo, and Floresanto formations persistently show large zircon content (> 40 grains), with preferential ages between 74 to 78 Ma. The youngest detrital zircon ages (14-24 Ma) further support derivation from Miocene strata, consistent with the observed clay mineralogy and the inferred Miocene detachment level (López-Ramos et al., 2022; Mora-Bohórquez et al., 2024). This would

mean that Los Aburridos mud volcano crosses predominantly Miocene stratigraphic sequences (Figure 2b).

Biostratigraphic analyses using calcareous nannofossils and planktonic foraminifera extracted of ejected material from mud volcanoes and their host rocks in the Sinú Basin indicate ages ranging from Middle Eocene to Late Miocene (Trejos-Tamayo et al., 2022).

Therefore, Los Aburridos mud volcano is classified in the “Miocene detachment level” domain, where mud originates from deeper sequences formed during the Miocene as shown in the restorations (Figure 2b) and seismic sections (Figure 3). Compared to nearby volcanoes that tap older Eocene-Cretaceous sources, mud volcanoes like El Totumo and Flamenco, Puerto Escondido and Los Aburridos are interpreted to source mud from Miocene units of the Floresanto and Pavo formations (Figure 2a), likely buried to depths exceeding 1km (Figure 2b) (Corredor, personal communication, July 2024)

Gas samples from Los Aburridos mud volcano showed low concentration of hydrocarbons, and an overall composition of $\text{N}_2 \sim 77.9\%$ and $\text{O}_2 \sim 21.8\%$, values very close to the compositional reference for atmospheric gases (López-Ramos et al., 2022). The

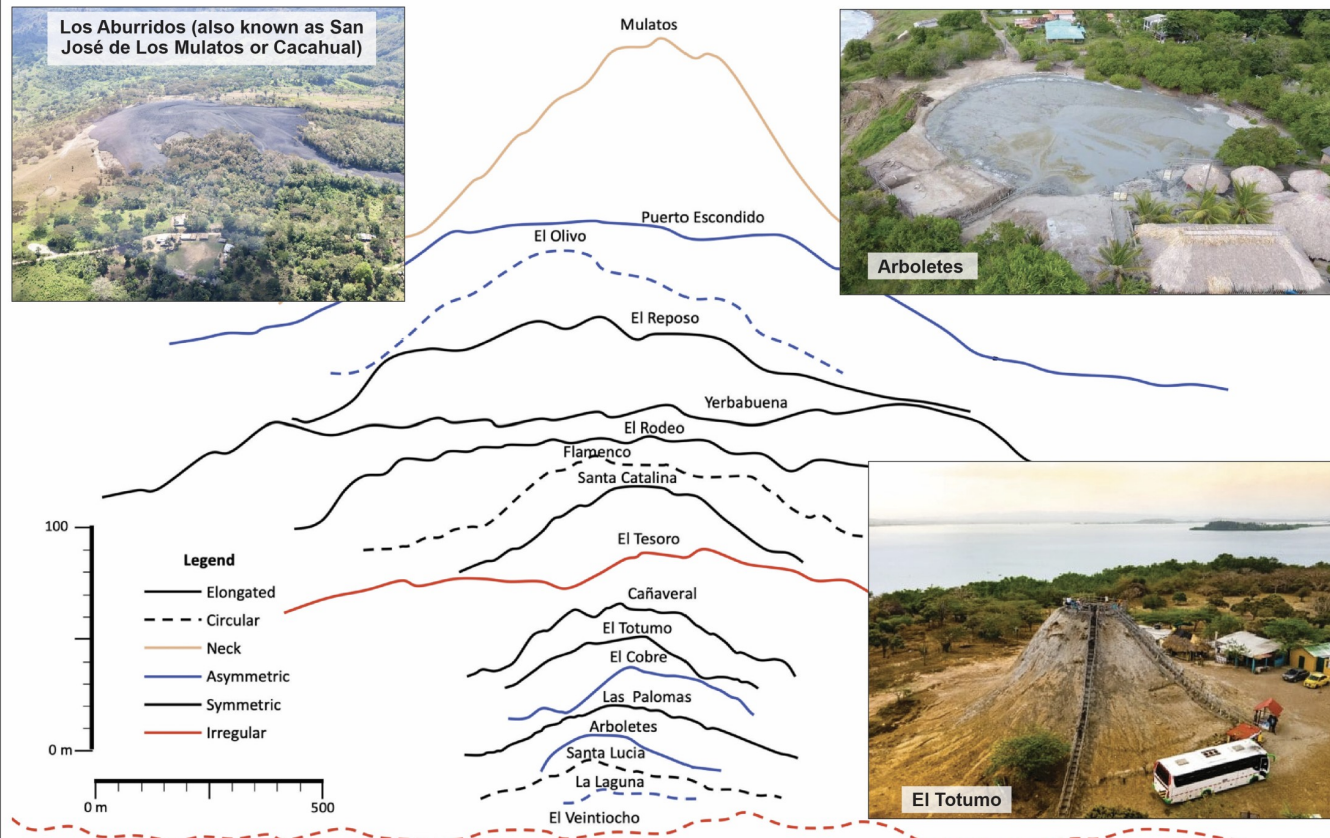


Figure 3. Average topographic profiles of mud volcanoes studied in the Colombian Caribbean margin based on measurements in Digital Elevation Models with 12m of resolution (modified from López-Ramos et al., 2020). Figure includes pictures of (A) Los Aburridos mud volcano, (B) Los Arboletes mud volcano in Antioquia region characterized by a low topography and wide vent, and (C) El Totumo mud volcano, a very popular tourist destination 30km north of Cartagena and Colombia's most famous mud volcano.

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natural gases found had a high concentration of methane (>80%), which may be related to the fractionation of hydrocarbons during the vertical migration process. There hasn't been any gas sampling from the most recent November 2024 eruption from Los Aburridos mud volcano, however, the explosion described in Section 3, suggest that the gas released had a significant methane component.

2.2 SURFACE EXPRESSION OF MUD VOLCANOES IN COLOMBIA

Mud volcanoes in northern Colombia exhibit distinct surface morphologies related to their eruptive behavior, sediment supply, and structural setting (López-Ramos et al., 2022). They are generally classified into three main topographic types:

1. Cones and Domes: characterized by elevated, symmetrical features with central vents, often formed through repeated eruptions of mud and clasts. Los Aburridos volcano is an example of this type of topography, as well as the famous El Totumo volcano (Figure 3).
2. Pools or Mud Flats: mostly shallow, low-relief features with broad mud spread and minor elevation. They can result from

slow mud extrusion or fluid seepage without building high topography (see Arboletes volcano in Figure 3).

3. Flow Fields: Characterized by irregular, lobate mud flows extending from a central or multiple vents. Typically associated with higher water content and low-viscosity mud.

Los Aburridos volcano specifically presents a well-developed conical morphology (classified among the cone/dome types, Figure 3), indicating a sustained over-pressured conduit and relatively high eruption recurrence. This morphology is typical of long-lived mud volcanoes and mirrors those observed at El Totumo and El Tesoro, where dome-like feeder structures have been proposed (Figure 4) (López-Ramos et al., 2022).

3. ERUPTIVE HISTORY OF LOS ABURRIDOS MUD VOLCANO

The earliest documented eruption occurred on October 17, 1972, when eyewitnesses reported a vertical flame column exceeding 100 meters in height, illuminating the surrounding area. This phenomenon was likely caused by the spontaneous ignition of methane gas released during the eruption. The eruption caused thermal damage to an estimated 20 hectares of crops and

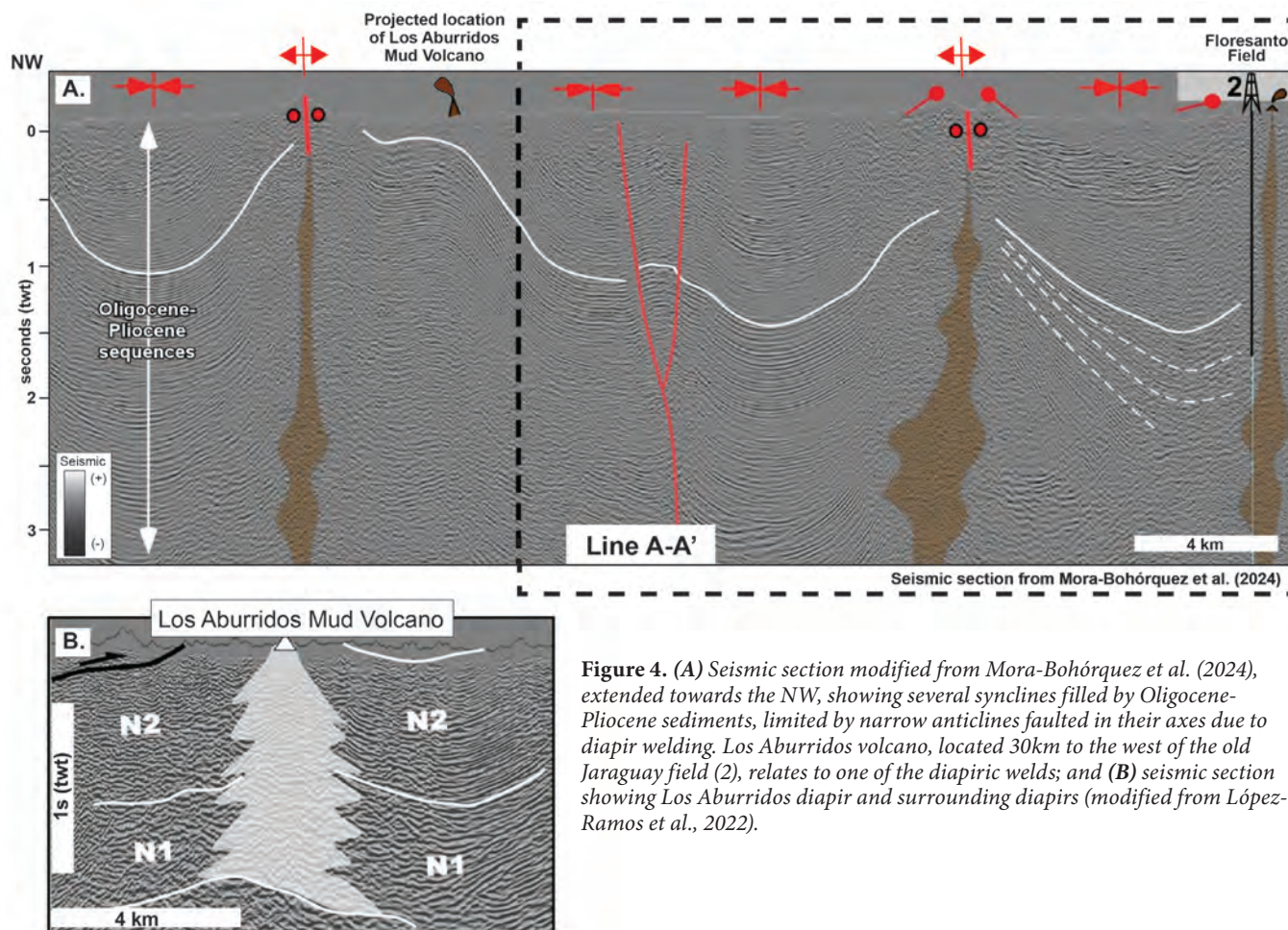


Figure 4. (A) Seismic section modified from Mora-Bohórquez et al. (2024), extended towards the NW, showing several synclines filled by Oligocene-Pliocene sediments, limited by narrow anticlines faulted in their axes due to diapir welding. Los Aburridos volcano, located 30km to the west of the old Jaraguay field (2), relates to one of the diapiric welds; and (B) seismic section showing Los Aburridos diapir and surrounding diapirs (modified from López-Ramos et al., 2022).

VIDEO 1



VIDEO 2



Figure 5. Captures from video footage of two unknown online sources at different locations during Los Aburridos (Cauchal) mud volcanic eruption of November 11 of 2024. The videos show a massive flare of methane mid-eruption precluded by an initial expulsion of considerable mud volume. Time stamps are located at the bottom right of each video capture.

“Los Aburridos” Mud Volcano

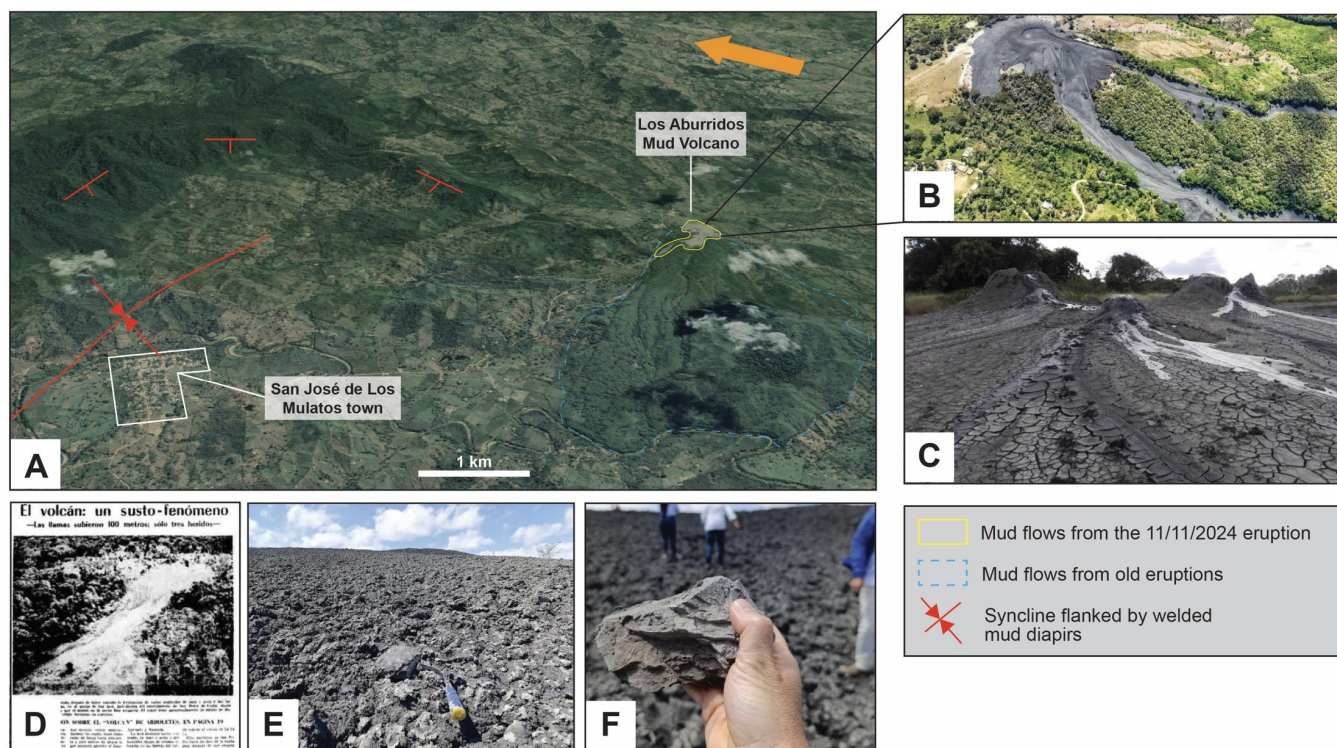


Figure 6. (A) Google Earth image showing mud flow deposits from the November 11, 2024 eruption and older mudflow deposits from Los Aburridos mud volcano. Also shown is Los Mulatos town within a wide anticline flanked by welded mud diapirs (Mora-Bohórquez et al., 2024); (B) Aerial photograph of mud flows from the November 11 of 2024 eruption; (C) Vents at the top of Los Aburridos volcano after the November 11 of 2024 eruption; Picture of (D) a newspaper cover featuring the 1972 explosion; (E) mud deposits from the November 11, 2024 eruption; and (F) hand specimen.

vegetation, injured at least three individuals, and damaged rural dwellings (El Colombiano, 2024).

A second major event occurred on July 19, 2003, producing a similarly dramatic nighttime display, often referred to locally as the “red sky” phenomenon. The eruption discharged two distinct mud flows: one engulfed approximately 100 meters of local roadway, and the other advanced across agricultural lands, burying vegetation and reportedly killing around 60 cattle. A number of rural homes within 100 meters of the vent were affected by the mud flows (El Colombiano, 2024).

The recurrence of these events could suggest episodic pressure buildup and discharge cycles within the regional mud-diapir system. These eruptions occur with little to no precursory seismicity or surface deformation, complicating early warning efforts (Publimetro, 2024; Semana, 2024b).

3.1 “LOS ABURRIDOS” EVENT OF NOVEMBER 11, 2024

On November 11, 2024, Los Aburridos mud volcano underwent two eruptive episodes within a three-hour period, as confirmed by the Servicio Geológico Colombiano (SGC). The first eruption, at approximately 16:30 local time, was marked by an explosive expulsion of methane-rich gas and large volumes of mud, accompanied by visible flames, likely caused by the spontaneous

combustion of released hydrocarbons (Figure 5). The second event, occurring around 19:30, involved a slower, more voluminous discharge of highly viscous mud but no combustion. The SGC emphasized the non-magmatic nature of the eruption, attributing it to fluid and gas overpressure within over-compacted subsurface clay, a mechanism characteristic of mud volcano systems (SGC, 2024).

Drone footage and field surveys documented mud flows up to two meters thick covering nearby vegetation and property, with visible fissures and vent structures forming at the surface (Figure 6c). The eruption prompted the evacuation of 109 families, driven by the risks associated with flammable gas, surface fissuring, and widespread mud inundation of surrounding infrastructure and agricultural land (El Espectador, 2024; El País, 2024; Semana, 2024b).

Unlike magmatic volcanoes, which are more widely known, mud volcanoes typically do not expel material at the same temperatures or in comparable volumes. However, as recent events have demonstrated, this does not mean they are harmless. While most mud volcanoes exhibit non-explosive behavior -such as slow bubbling or oozing of mud- explosive eruptions can occur, as was observed in this case (Figure 5).

“Los Aburridos” Mud Volcano

4. SIGNIFICANCE FOR HYDROCARBON PRESENCE AND MIGRATION

The San Jacinto Hanging wall domain, located west of the Sinú Fault in the northern Colombian Caribbean margin, presents compelling indicators of hydrocarbon potential. This domain is structurally defined by compressional deformation within the accretionary wedge complex of the Sinú-San Jacinto Basin and hosts numerous active mud volcanoes, including Los Aburridos, El Totumo, and Puerto Escondido (López-Ramos et al., 2022).

Los Aburridos mud eruption provides evidence for active methane migration within the Urabá Basin, raising questions about the presence of deeper hydrocarbon systems. The eruption dynamics, gas composition, and overpressure regime observed are consistent with characteristics found near hydrocarbon-rich provinces. Mud volcanoes have long been regarded as surface expressions of deep-seated petroleum systems, particularly in regions where hydrocarbon generation and migration are ongoing.

Active mud extrusion in this area is interpreted as surface evidence of mature petroleum systems operating at depth. The expelled muds, clasts, and hydrocarbon gases sampled from mud volcanoes along the Caribbean margin of Colombia display thermogenic characteristics consistent with oil-prone source rocks (López-Ramos et al., 2022). Isotopic analyses on gases such as CO₂ recovered from the different mud volcanoes like Los Aburridos, analyzed along the Serranía del Sinú show a clear mixture of gases of microbial to early thermogenic origin, consistent with a low degree of organic matter maturity recovered from nearby exploratory wells (López-Ramos et al., 2022). Clast lithologies transported to the surface by mud volcanism include organic-rich shales and siltstones, indicating exhumation from stratigraphic units buried to sufficient thermal maturity, primarily within the Miocene and older successions (López-Ramos et al., 2022).

Los Aburridos and nearby volcanoes within the San Jacinto Hanging-wall domain are geochemically and stratigraphically associated with a deeper detachment level located within the Miocene. These formations are known to contain potential source rock intervals and fine-grained sediments conducive to hydrocarbon generation. U-Pb detrital zircon dating of mud samples from Los Aburridos reveals a dominant age peak at ~74 Ma, correlating with Upper Cretaceous to Paleogene sediment provenance and further supporting the inference of vertical hydrocarbon migration from mature source intervals (López-Ramos et al., 2022).

According to Frost (personal communication, July 2025), the 3D seismic data acquired by BHP and Ecopetrol across the shelf area of the offshore Sinú Basin, -north of where Los Aburridos mud volcano is located-, reveal extensive toe-thrust structures exhibiting evidence of breached top seals at the crests. This is

likely associated with elevated pore pressures resulting from the rotation of porous and permeable, originally flat-lying basin floor fan deposits into steeply dipping, shallow anticlines. Efforts were made to identify traps with intact top seals protected by pore pressure regimes; however, most structures appeared to be breached. Further basinward, in the deep-water “Purple Angel” block (see location in **Figure 1**), 3D seismic interpretation identified Class II/III AVO anomalies, suggesting improved seal integrity. Although the exploration objective was oil, drilling to date has encountered only significant volumes of dry gas.

In summary, the San Jacinto Hanging-wall domain, displays multiple indicators a working petroleum system, with active mud volcanism providing direct evidence of subsurface hydrocarbon migration. The structural setting, thermogenic geochemical signatures, and detrital zircon provenance analyses collectively support its classification as a high-potential hydrocarbon-bearing region.

5. CONCLUSION AND RECOMMENDATIONS

The spatial distribution and structural control of Los Aburridos and its neighboring mud volcanoes reflect the interplay between regional compressive stress, inherited fault architecture, and fluid overpressure from the Sinú Fold Belt to the San Jacinto Fold Belt. The November 11, 2024 eruption of Los Aburridos mud volcano underscores the relevance of Colombia’s deep fluid migration and subsurface tectonism, but also serve as geodynamic and geochemical markers of the ongoing South American-Caribbean Plate interaction.

While the immediate effects of the eruption were localized, the event highlights broader implications related to subsurface fluid migration, methane emissions, and the potential for unexplored hydrocarbon accumulations. Isotopic studies and remote sensing of additional vents in the area are recommended to delineate the extent of the active hydrocarbon system. Moreover, continued monitoring of micro-seismicity and gas fluxes could help establish the periodicity of eruptions and the dynamics of fluid mobilization.

On the other hand, there remains a widespread misconception among the public and local authorities that mud volcanoes pose minimal risk, a belief that has enabled the expansion of residential, tourism, and transportation infrastructure in close proximity to these features. Historical accounts from the region document past eruptions involving both material damage and loss of life. Mud volcanoes are natural geohazards and should be treated as such through effective risk communication, education, and regulatory oversight.

Despite the relatively small scale of the eruption, the affected area was not insignificant. Had a similar event occurred at one

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of the region's more frequented “tourist” mud volcanoes, the consequences could have been far more severe. This underscores the need for a more comprehensive risk assessment and management framework.

6. ACKNOWLEDGEMENTS

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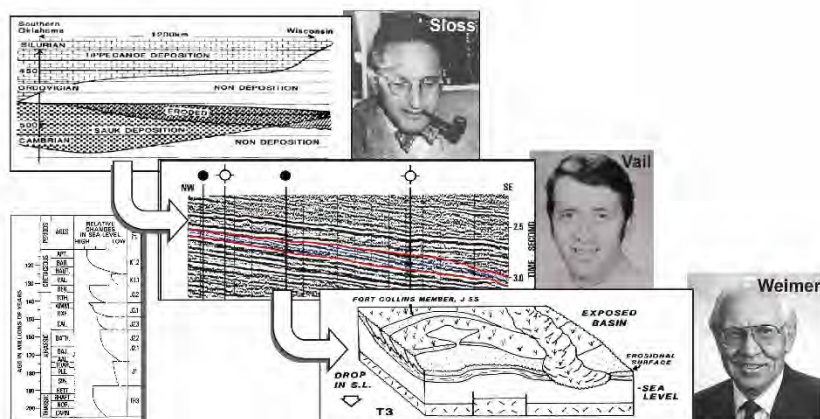
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Cycles and Sequences, So What?
A 21st century perspective in memory of Peter Vail, Bob Weimer, and Larry Sloss

Announcement and Call for Papers



With the recent passing of Pete Vail and Bob Weimer and the approaching 50th anniversary of the publication of AAPG Memoir 26, not to mention the recent retirements of the 1st generation that grew up with Memoir 26 and the rise of new generations of practitioners and innovative techniques, it is a propitious time to take stock of sequence stratigraphy in particular and applied stratigraphic analysis in general: where it came from, where's it going, and what's it good for...and to pass along hard-won practical lessons.

This year's conference features a hybrid program of short talks by practitioners who worked with Vail, Weimer, and Sloss, as well as those who

have applied and expanded their concepts, hands-on exercises, discussions, case-study talks, and panel discussions that illustrate each of four focus areas:

- **Historical Perspectives** on the development of present-day integrated stratigraphic analysis since Sloss (e.g., incorporation of high-resolution age control and seismic, expansion to non-marine systems, etc.).
- **Regional- to basin-scale** concepts and applications (e.g., cycle chart uses and abuses, tectonic influences, systematic changes in reservoir-target age across a basin, etc.).
- **Play- to field-scale** concepts and applications (e.g., incised valleys, resource plays, sub-unconformity plays).
- **Practical applications** and tools for energy and other resources (groundwater, GCS/CCUS, H₂ storage) and planets.

This program will offer opportunities to examine classic data sets in a series of collaborative exercises, affording a shared experience to focus discussion of foundational concepts...and assumptions...considering more than 50 years of application, experience, and innovation. We welcome industry and academic practitioners who have tested, applied, improved, and expanded these concepts, students and practitioners who would benefit from understanding their development and application, and researchers looking for new opportunities to advance these concepts.

We invite a diverse set of papers illuminating the history of integrated stratigraphic analysis and the near-term and long-range future, especially those that explore the practical application of such analyses to hydrocarbon and critical mineral exploration, groundwater, geothermal, and emerging resource exploitation, and the interpretation of the geological history of Earth and Mars. Student posters and presentations are encouraged.

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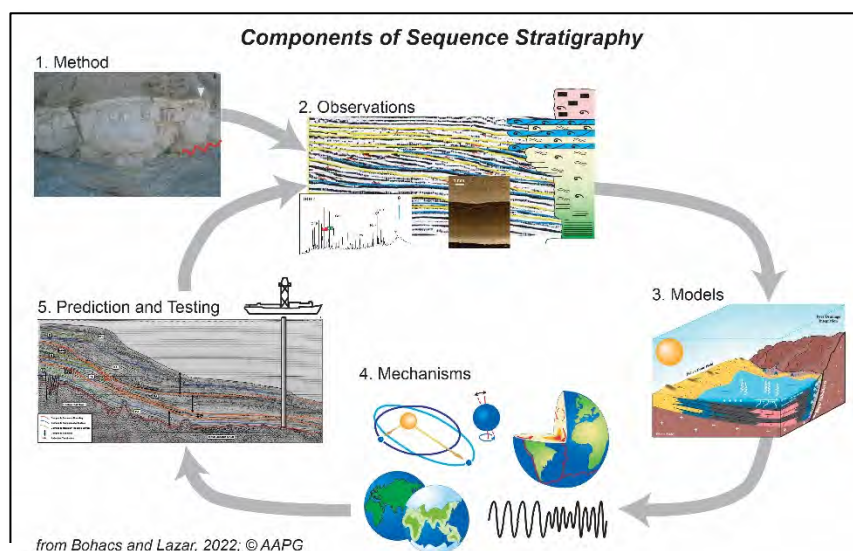
June 1, 2025	Expression of interest: Provide title of presentation and brief abstract
June 30, 2025	Preliminary Program Announced
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A Vision that Took Root: Commemorating 20 Years of the Conjugate Basins, Tectonics, and Hydrocarbons (CBTH) Consortium

By Lucía Torrado with contributions from Paul Mann, Alejandro Escalona, Ruth Beltrán, Kyle Reuber, Adam Goss and Jeff Storms

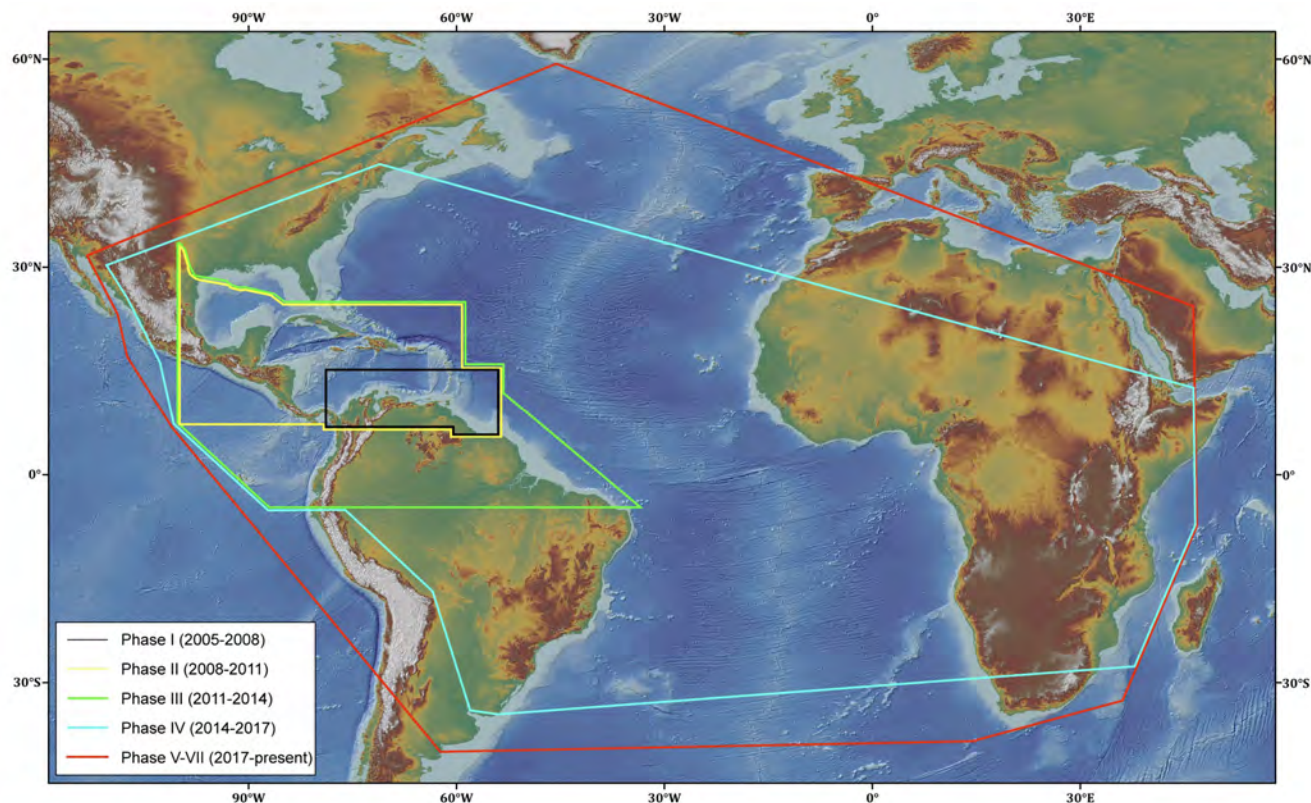


Figure 1. Map illustrating the primary research focus areas of each CBTH consortium phase since 2005.

The first time I met Paul Mann (Principal Investigator of the CBTH consortium) was on a rainy Tuesday afternoon in Houston, during one of those classic Gulf Coast downpours that seem to fall sideways. By the time I made it to the University of Houston's Earth and Atmospheric Sciences building, my umbrella had already surrendered to the wind, turning inside out in defeat. Stepping into the lobby, I was just a little unsure of what to expect... I was there to meet who I was hoping would be my thesis co-advisor. We had exchanged a few emails in the weeks before; I had shared that I was working in the Llanos Basin in Colombia under the supervision of Janok Bhattacharya, and he was in the process of relocating the CBTH consortium from the University of Texas at Austin to Houston. The conversation felt half like an interview, half like an unexpected opportunity unfolding. A conversation that ultimately led to an eight-year collaboration that shaped the course of my career.

Through the CBTH consortium, I completed both my master's and doctoral research, presented our work at numerous conferences -including AAPG and SEG annual meetings and multiple Sheriff

Lectures- and contributed to peer-reviewed publications. My experience, which mirrors that of many others in the project, offered the opportunity to engage with a community that bridges rigorous academic science and applied industry insight. In this article, you will also hear directly from my colleagues, whose experiences further illustrate the impact of the CBTH on both scientific and professional geoscience communities, including the Houston Geological Society.

Even after several years, I still keep in touch with Paul and consortium current and former members. Writing this article to commemorate the CBTH's 20th anniversary is both a professional milestone and a personal reflection. It feels especially meaningful to share these stories in the September issue of the *Bulletin*— the same month where two decades ago, a PhD dissertation became a regional basin research powerhouse.

WHAT IS THE CONJUGATE BASINS, TECTONICS AND HYDROCARBONS (CBTH) CONSORTIUM?

The Conjugate Basins, Tectonics and Hydrocarbons (CBTH)

A Vision that Took Root: Commemorating 20 Years



Figure 2. Paul Mann (CBTH Principal Investigator) together with CBTH graduate researchers and sponsors at the year-end sponsors' meeting hosted by Woodside Energy in September 2024

project at the University of Houston is an industry-funded research consortium that creates GIS-based digital and atlas syntheses of seismic and well data to evaluate the regional hydrocarbon potential of vast areas shaped by the Mesozoic breakup of Pangea. Since its inception on September 1, 2005, the project's geographic scope has spanned (**Figure 1**):

1. The known hydrocarbon basins of onshore regions and the lesser-studied offshore basins of the Caribbean and northern South America (including Venezuela, Colombia, Trinidad, Suriname, Guyana, and northern Brazil);
2. The U.S. and Mexico sectors of the Gulf of Mexico;
3. The rifted-passive margins of Central America, eastern North America, and western Europe; and
4. The South Atlantic conjugate margins in South America and West Africa.

The roots of the CBTH trace back to the three-year DM2 industry consortium led by Dr. Lesli Wood (UT-BEG) and Paul Mann (UTIG). From the start, Paul brought a clear vision for building an international research network that could bridge academic science and industry exploration. Over time, the project -organized in three-year phases- has evolved in focus, responding to the needs, feedback and interests of its sponsoring companies. Paul emphasized that sponsor feedback is critical, noting that it helps guide the project's direction so the team can produce work that directly supports exploration efforts.

Since 2005, the CBTH has received funding from 31 oil and gas

companies, including current sponsors CNOOC International, Chevron, Petrobras, TotalEnergies, and Woodside Energy (**Figure 2**). The project's academic impact is substantial: 23 PhD dissertations, 47 Master's theses, 12 Bachelor's theses, 853 conference presentations, and 151 peer-reviewed publications: numbers that reflect both research productivity and his commitment to training the next generation of geoscientists.

The CBTH's data library -built and expanded under Paul's oversight- includes 2D and 3D seismic, well logs, outcrop measurements, and an extensive archive of published studies. These datasets are integrated into structural, isopach, and paleogeographic maps, all available in digital format to sponsors. While the Caribbean and Gulf of Mexico remain major areas of focus, the CBTH continues to advance projects in Brazil and West Africa, cementing its reputation as a globally recognized resource for hydrocarbon basin research.

THE BEGINNINGS: FROM ALEJANDRO ESCALONA'S PH.D. DISSERTATION TO A REGIONAL BASIN RESEARCH POWERHOUSE

When I reached out to Alejandro Escalona (former co-Principal Investigator of the CBTH consortium) about collaborating with this article, he replied almost immediately. His eagerness to contribute, even years after his formal involvement ended, speaks volumes about the project's lasting impact and continued significance in his life and career.

The Conjugate Basins, Tectonics, and Hydrocarbons (CBTH) consortium -previously known as the Caribbean Basins, Tectonics, and Hydrocarbons- was born from a vision shaped at the intersection of academic curiosity, tectonic complexity, and the underexplored potential of the Caribbean region.

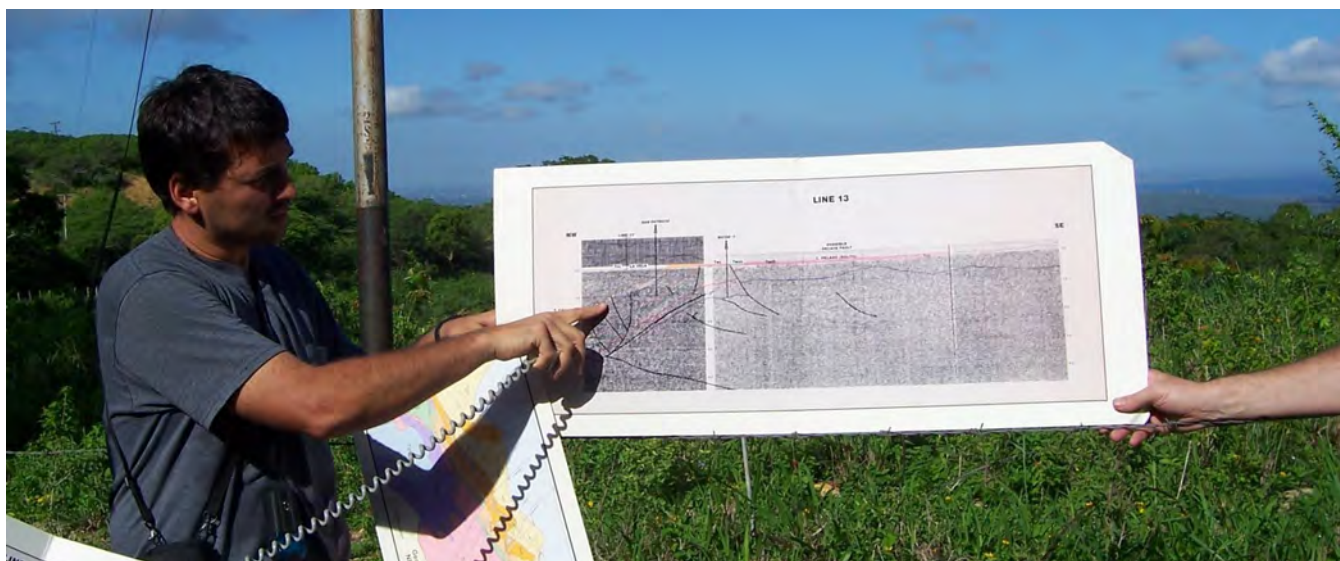


Figure 3. Alejandro Escalona (former CBTH co-Principal Investigator) at a field trip in his native Venezuela in 2004.

The idea of the consortium emerged in late 2003, shortly after Alejandro completed his PhD at The University of Texas at Austin under the mentorship of William Fisher and Paul Mann. His dissertation focused on regional-to-reservoir scale characterization of Eocene reservoirs in Venezuela's Maracaibo Basin, where a significant component of this work involved revisiting Caribbean Plate models initially developed by the UT Institute for Geophysics and the PLATES consortium (Figure 3).

"At the time, Paul Mann was collaborating with Lesli Wood on mass transport complexes in offshore Trinidad," Alejandro recalled. "That work got us thinking: why not build a regional basin project for the Caribbean? One where plate tectonic and paleogeographic models were fundamental to better understand the relationship to the hydrocarbon-rich onshore basins of northern South America, and the underexplored offshore basins of the Caribbean."

Armed with conceptual models derived from Alejandro's dissertation and Paul's regional expertise, the team embarked on a three-day trip to Houston. They knocked on doors at nearly 20 oil and gas companies in a bid to secure sponsorship. Six sponsors were needed to launch the consortium with sufficient momentum. "To our surprise, when we returned to Austin, six faxes were waiting for us," Alejandro said. "It was a clear signal that the industry was hungry for high-resolution, integrative regional work."

From there, the CBTH consortium rapidly evolved. The team reprocessed legacy Gulfex data, compiled unpublished research, and relied heavily on digital tools like ArcGIS and Landmark to create integrated maps and databases. Support from the PLATES consortium proved essential in refining the Caribbean tectonic model.

"We weren't just building a research project: we were building applied geoscience infrastructure," Alejandro explained. Slowly, the CBTH started to obtain more sponsorship and collaboration with government agencies, and national oil companies in the Caribbean. "Students got deeply involved too, and many went on to work with sponsors directly. That was a huge part of our success."

In 2007, Alejandro relocated to Stavanger, Norway, to help establish geosciences education and research at the University of Stavanger (UiS). This move indirectly helped the CBTH project transition from the University of Texas to the University of Houston, where it continued under the leadership of Paul Mann. Over the next 15 years, Alejandro remained involved as co-principal investigator, collaborating closely with students and faculty on both sides of the Atlantic. GIS specialist Lisa Watson also moved to UiS, extending

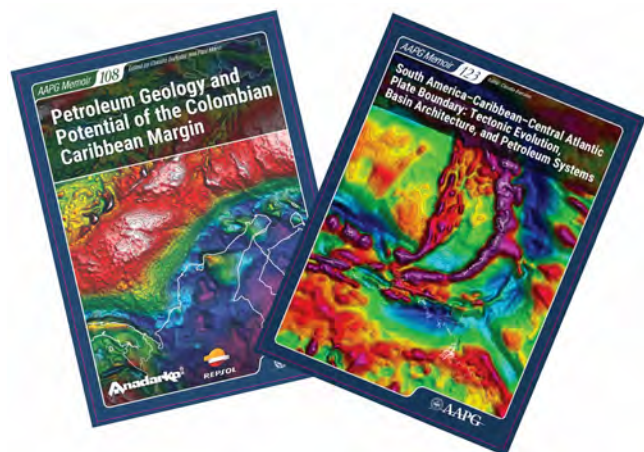


Figure 4. Covers of AAPG Memoir 108 (left) and Memoir 123 (right), featuring contributions from CBTH researchers.

A Vision that Took Root: Commemorating 20 Years



Figure 5. Paul Mann (CBTH Principal Investigator) at the 2007 AAPG Annual Convention and Exhibition.

her contributions, and the CBTH benefited from the expertise of Ian Norton – former ExxonMobil scientist and key PLATES contributor–, who frequently visited Stavanger to collaborate.

“Our work on the Caribbean plate model and paleogeography is now published multiple recognized journals such as AAPG’s *Memoirs* 108 and 123,” Alejandro noted (**Figure 4**). “It’s one of the most complete syntheses we’ve ever produced.”

Today, Alejandro is no longer formally involved with the CBTH project, but he remains closely tied to Caribbean tectonics. His current focus is the Norwegian continental shelf, but the roots of that first regional initiative still run deep. “My heart still lives in the Caribbean,” he said. “Whenever I get the chance, I return to those questions. They never really let go.”

THE EVOLUTION OF THE CBTH: IN THE WORDS OF PAUL MANN, PRINCIPAL INVESTIGATOR

Paul recalls the early years of the CBTH, which formally began at UT Austin during the 2005–2008 startup phase with co-leader Alejandro Escalona. Their initial focus was on Venezuela and Trinidad and Tobago, coinciding with the Bolivar offshore survey. Even in this early stage (**Figure 5**), Paul’s leadership style was hands-on: coordinating seismic data access, guiding student projects, and ensuring results were delivered in a form that industry partners could immediately apply.

In the second phase (2008–2011), the focus shifted westward to Colombia as exploration expanded from mature onshore basins to the slope and deep-water of the Caribbean Sea. With Alejandro’s move to the University of Stavanger in Norway, Paul oversaw the CBTH’s operations across two universities, fostering international collaboration and maintaining consistent research momentum.

The third phase (2011–2014) marked the CBTH’s relocation to the University of Houston, where Paul strengthened ties with company sponsors, data providers, and the Houston Geological Society, capitalizing on Houston’s position as a global hub for the energy industry. “Being in Houston gave us unparalleled access to industry expertise and datasets,” he noted. This period also showcased his ability to secure high-value seismic and well data, greatly expanding the scope of Caribbean studies and extended its reach into the rifted margins of the Gulf of Mexico.

During the fourth (2014–2017) and fifth (2017–2020) phases, the CBTH completed major projects in the Caribbean and both the Mexican and U.S. sectors of the Gulf of Mexico. Paul encouraged the team to look outward, initiating studies on the conjugate rifted margins of the South Atlantic in South America and West Africa. This expansion prompted a formal name change from its original Caribbean-focused title to “Conjugate Basins, Tectonics and Hydrocarbons,” while retaining the CBTH acronym that had become well known to sponsors and collaborators.

The sixth (2020–2023) and current seventh (2023–2026) phases, Paul has guided the CBTH’s concentration on the South Atlantic conjugate margins, with research targeting productive and emerging basins in Guyana, Equatorial Brazil, Campos-Santos, Uruguay, Argentina, Morocco, Mauritania, Liberia, Nigeria, Equatorial Guinea, and Namibia. Throughout these shifts, he has remained focused on the CBTH’s core mission: integrating seismic, well, and geological data into a unified GIS database to deliver tectono-sequence analyses, depositional models, petroleum system evaluations, paleogeographic reconstructions, and plate reconstructions.

Recent work under his leadership includes the development of regional basin models for Guyana and the Campos-Santos basin, designed to help de-risk deep-water exploration. “Our goal is to provide science-based, region-wide syntheses that directly improve exploration outcomes,” Paul said. His approach blends scientific rigor with practical application, ensuring that the CBTH’s research remains relevant and impactful.

Under Paul’s leadership (**Figure 6**), the CBTH has thrived not only because of its technical capabilities, but also because of his ability to connect people, ideas, and data sources across continents. Colleagues note his skill in building lasting collaborations between academia and industry, creating an environment where graduate students can work directly with world-class datasets and learn from active exploration challenges. His commitment to training the next generation of geoscientists is evident in the project’s strong academic output and in his personal mentorship style, which blends scientific rigor with a clear vision for applied impact (**Figure 7**).



Figure 6. (A) Thanksgiving celebration at the CBTH lab in 2017; (B) Researchers at the CBTH lab in Fall of 2016. Left: Delaney Robinson. Right, from back to front: Lucia Torrado (HGS Editor), Pin Lin, and Lily Zhang; (C) Visit by Paul Mann (CBTH Principal Investigator) and the CBTH consortium to TotalEnergies' offices in 2018; and (D) CBTH annual year-end sponsor meeting held at the University of Houston, September 2015.



Figure 7. (A) The University of Houston team, champions of the 2017 AAPG Imperial Barrel Award, supervised by Paul Mann. From left to right: Delaney Robinson, Walter Reed, Eric Lunn (former CBTH researcher), Andrew Steier (former CBTH researcher) and Leiser Silva; (B) First-place poster award at the 2017 AAPG Annual Convention and Exhibition. Left: Lucia Torrado, former CBTH researcher and HGS Editor; Right: Paul Mann, CBTH Principal Investigator; (C) First, second and third-place poster award winners at the 2013 AAPG Annual Convention and Exhibition. From left to right: Bryan Ott (former CBTH researcher), Paul Mann (CBTH principal investigator), Luis Carlos Carvajal (former CBTH researcher), and Lucia Torrado (former CBTH researcher and HGS Editor); and (D) From left to right: Paul Mann, and first- and third-place poster awardees Henry Campos and Rocio Bernal (both former CBTH researchers), at the 2011 AAPG Annual Convention and Exhibition.



Figure 8. (A) Kyle Reuber (former CBTH researcher) at a the CBTH year-end sponsor meeting, September 2012; (B) Former CBTH researchers Rasheed Ajala (left) and Andrew Steier (right) at the 2016 HGS-PESGB Africa Conference; (C) CBTH researcher Ruth Beltrán at the 2024 Sheriff Lecture; and (D) Former CBTH researcher Luis Carlos Carvajal (right) presenting to industry sponsor Adam Goss (left) at the 2015 GCAGS Conference (now GeoGULF).

RUTH BELTRAN'S STORY AS A PHD CANDIDATE WITH THE CBTH

When Ruth began her PhD studies with the support of an oil company scholarship, one of the key requirements was joining a world-class research group. For her, the choice was clear. The CBTH (Conjugate Basins, Tectonics, and Hydrocarbons) consortium stood out, not only because of its strong reputation in the oil and gas industry, but also for the kind of high-impact, data-driven research it is known for. Since joining in the Fall of 2022, Ruth has been part of a highly technical and collaborative team working at the frontlines of Earth science and energy exploration.

“The CBTH helped me ask the right questions and apply the right tools to answer them,” Ruth reflects. The consortium’s focus on understanding some of the world’s most important oil and gas basins, many of which contain globally significant fields, aligned closely with her research goals. The group is known for its scientific output, including peer-reviewed publications and frequent presentations at major geoscience conferences: clear signs of the strong mentorship and training it provides.

Through the consortium, Ruth has received hands-on experience working with state-of-the-art seismic data, well logs, gravity and magnetic datasets, and advanced basin modeling tools. This training has deepened her understanding of extensional basin systems around the world and prepared her to contribute meaningful research to both academia and industry.

She admits that she entered the program with limited experience in deep-water exploration. But working alongside Dr. Paul Mann and the CBTH team helped her quickly find her footing. The group’s collaborative culture—marked by open discussions, brainstorming sessions, and constructive critique—shaped her approach to research. “We constantly test our ideas through peer review and industry feedback, which pushes the quality of our work and keeps it grounded in real-world relevance,” she says.

Her current research centers on the deep-water Campos Basin offshore Brazil. The first chapter of her dissertation, currently under review for the journal *Tectonics*, focuses on the deep crustal structure of this rifted-passive margin. Ruth integrated 3D seismic

A Vision that Took Root: Commemorating 20 Years

data with gravity and magnetic datasets to examine the thinning of the continental crust and its transition to oceanic crust. She has already presented this work at several key conferences, including the Sheriff Lecture (**Figure 8**), IMAGE, and GEOGULF 2023.

Looking ahead, Ruth is eager to return to the industry and apply the knowledge and experience she's gained through the CBTH. She values the power of open collaboration, not just within companies but across the broader scientific and energy communities. "I believe in sharing knowledge, not just within companies, but across the wider scientific and energy communities," she says. Her experience with the CBTH consortium has reinforced her belief in what's possible when academia and industry work together toward a shared goal.

A STORY OF SCIENCE, COLLABORATION, AND DISCOVERY: KYLE REUBER'S PATH THROUGH THE CBTH

During his time as a University of Houston PhD candidate with the CBTH, Kyle experienced significant learning, collaboration, and growth as a scientist. This opportunity allowed him to explore complex geological systems while working closely with a global network of geoscientists and mentors.

From Kyle's perspective, the CBTH program offered a unique environment that blended academic rigor with applied research. Under the guidance of experienced faculty and through feedback from industry collaborators, he had the chance to evaluate hypotheses related to regional tectonics and basin evolution in some of the most geologically dynamic regions on Earth. The support Kyle received from Paul and his employer at the time, ION Geophysical, enabled him to focus his research on seismic interpretation, geospatial analysis, and subsurface modeling: tools vital to understanding petroleum systems and the tectonic histories of conjugate margins.

Paul placed strong emphasis on the development of presentation skills, a critical ability cultivated by all consortium students. Kyle described how these skills were honed through weekly tectonics seminars, consortium meetings, and industry sponsor presentations (**Figure 8**). "These opportunities allowed me to test my research hypotheses, think more broadly, and stay up to date with the latest advances in both academia and the energy sector," he explains. The interdisciplinary collaboration and the process of defending his ideas became one of the most rewarding aspects of his time in the CBTH.

Moreover, Paul actively encouraged students to engage in events that included student-focused networking, industry exposure, and

professional development. As a result, Kyle co-chaired technical sessions, served as a committee member, and presented student posters at several Houston Geological Society conferences. He also participated in the HGS International Explorationists dinners, events he valued for their combination of strong technical content and networking opportunities.

Reflecting on his experience, Kyle expressed gratitude for his tenure in the CBTH consortium. "It introduced me to an industry-based community of mentors and peers, laid a foundation for scientific excellence, and gave me a clear vision of how research can bridge academia and industry," he said.

INDUSTRY PERSPECTIVE: A DECADE-LONG COLLABORATION WITH THE CBTH

Adam Goss' involvement with the CBTH consortium began more than a decade ago, when he served as technical lead for BHP's Mexico and later Trinidad exploration programs. At that time, BHP was a corporate sponsor during the consortium's early research phases, which focused on Caribbean and Gulf of Mexico tectonics (**Figure 8**). These studies challenged long-standing paradigms of crustal and basement architecture, heat flow, and terrane boundaries, laying the groundwork for new internal concepts regarding source rock distribution and maturation, reservoir provenance and quality, and the timing of structural trap formation.

As Adam advanced to New Ventures Manager and later Director, his team relied heavily on the steady stream of technical innovation generated by the CBTH. He also benefited directly from the program's talent pipeline, hiring several of its alumni into BHP's Exploration teams. On the value of the program, Adam stated, "The CBTH's research consistently provides insights that shape our exploration strategies."

When Adam later joined CNOOC International, he collaborated with leadership in London and Beijing to reestablish the company as a primary CBTH corporate sponsor, a decision motivated by his strong appreciation for the consortium's contributions. Over the last several years, he has observed firsthand how the CBTH deliverables provide a sustained technical competitive advantage. As reflected in the perspectives of principal researchers, students, alumni, and long-term partners, the consortium continues to track evolving trends and deliver research that provides the oil and gas industry with valuable insights for exploration. Regarding the CBTH's broader impact, Adam emphasized, "The technical knowledge and deliverables from the CBTH give our teams a clear advantage in decision-making and project execution". ■

ROCK SOLID GUESS!



HINT: This precious gemstone is found in only one place... and its location is hidden somewhere on this issue's cover. *Photo Credit: Daniel Virgadola @Exotic Crystals Creations*



HINT: Ted Godo's favorite outcrop. *Photo Credit: Ted Godo*

WORD BRECCIA – A GEOLOGY WORD JUMBLE

Unscramble the words below and rearrange the circled letters to find the answer to the clue.

LDNIAS RAC _____○○

VANOLCO _____○_____

PMEUL ____○____

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HINT: Hidden in this issue's cover photo, the answer is _____, also known as the "C" of the ABC'S.



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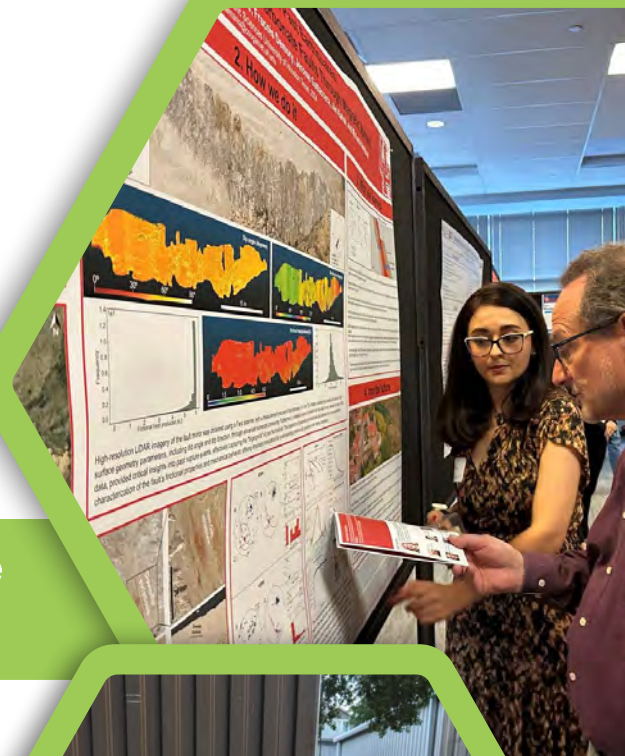
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Pivot Profile

From Corporate to Independent: A “TED” Talk with Ted Godo

By Lucia Torrado



As the outgoing editor of the Houston Geological Society Bulletin, Ted deserves more than just a quick note of thanks. Even though I already knew of his background, I wanted to hear directly from him. After all, he had done such a fantastic job with the Bulletin, and I felt it was only right to highlight him in this first issue and the return of Pivot Profile.

Ted's career is both long and inspiring. He spent more than 35 years at Shell and 5 years at Murphy Oil, a tenure that speaks for itself in an industry where change is constant. But he recalls one very specific moment that shaped the trajectory of his growth.

The story begins in 1979, when Ted was based in Shell's Houston office. Those were the days where all geologists' work involved evaluating and annotating paper logs and filing them in personal cabinets. Seismic interpretations were also done on paper copies, interpreted with colored pencils at a drafting table where all event intersections with time values were hand-copied onto blank base maps and then hand-contoured. All reports were handwritten and submitted to the typing pool for documentation filing. Ted spent considerable time in Oklahoma and Arkansas doing fieldwork and collecting outcrop samples in thrust sheets, experiences that set the stage for his first promotion as team leader while working in the Utah overthrust belt.

THE PIVOTAL MOMENT, SEVEN YEARS INTO TED'S CAREER

Then came 1986. Transferred to New Orleans, Ted suddenly found himself leading a team of 16 geologists and geophysicists. On paper, it was a step up. In reality, it was overwhelming. With yearly offshore lease sales, Ted found himself in a new environment as a team leader. His role involved managerial paperwork, conducting personal reviews, keeping staff focused on their technical tasks, and providing technical assistance. He admits he preferred technical work to management and, at that time, had little exposure to salt tectonics or to AVO, an emerging seismic

technique. More importantly, Ted had been working onshore in hard rocks and wasn't very familiar with seismic “bright spots” (or DHI's), developed in Shell by Mike Forrest and used in lease sales from 1968 onward. The AvO component of amplitude evaluation, - although the theoretical concepts of AvO began in the 1960s-, only gained wider recognition in the 1980s.

In this unfamiliar territory, Ted felt unsure as a team leader. He recalls the day that changed everything:

“The defining moment came in a team meeting in late 1986, where I was at the front writing on the greenboard, outlining what the team needed and setting priorities. A geophysicist on the team raised his hand and said that this new AvO idea needed more work. Not understanding what he meant, I quickly turned to the greenboard and wrote ‘we need more ABO.’”

He had written the letter “B” instead of the “V” for “versus.” The room chuckled nervously, and Ted asked, “What?” Once it was explained, the realization hit. He remembers thinking: what kind of team leader am I if I don't even know the fundamentals of what my team is working on?

Instead of pretending otherwise, Ted walked into his boss' office and asked to be reassigned to a team where he could learn. His boss, puffing on a cigar, told him: “I see you walking down the hall, and you look like a shadow of a man.” Ted's reply was just as honest: “I guess you would agree with me then.”

That turning point -one he tells with equal humility and humor- shaped the rest of his career. As he puts it:

“That 1986 event significantly shaped my growth by prompting me to acknowledge my deficiencies and concentrate my learning and development across all geoscience specialties, ultimately enhancing my basin-wide understanding and enhancing my ability to find oil as an explorationist.”

NO PAUSE BETWEEN CHAPTERS

Later, after retiring from Shell as chief geologist, Ted barely paused before beginning a new chapter. On Monday morning,

*Exposure to
different companies'
interpretation methods
allowed me to grow
more technically and
experience a wider
range of problem-solving
approaches*

after his last day at Shell, he was at Murphy Oil, serving as senior geologic advisor. The role took him across the globe, reviewing new venture opportunities (especially along the West African coast), and working directly in the offices of smaller European companies. He thrived on comparing interpretations, testing new approaches, and seeing how other teams framed problems.

“Exposure to different companies’ interpretation methods allowed me to grow more technically and experience a wider range of problem-solving approaches,” he explained. He also emphasized how meaningful it was to broaden his network, noting how those professional courtesies and connections continue to enrich his work today.

“FOLLOW YOUR PASSION”

The move from a large company to independent work was not just a career shift: it was a mindset shift. Instead of relying on the stability and training structure of a major corporation, Ted drew on his own maturity, technical depth, and judgment built over decades. He emphasized the importance of adaptability, humility, and the willingness to keep learning, even after 40 years in the field.

When asked about advice for young professionals in today’s uncertain energy landscape, he stressed two things above all: passion and the ability to learn. He cautioned against starting out in consulting, noting that it requires deeper knowledge and a strong network. Instead, he recommends beginning at a major oil company for the structured training, courses, and mentorship. He even smiled while reminiscing about the old tradition of the “Dutch Uncle”—a mentor who gave tough but caring guidance, adding with a laugh: “The ‘Dutch Uncle’ is likely hard to find in today’s world, even at Shell.”

I closed this interview by asking him: what advice would you give to our younger self? “Follow your passion” Ted replied firmly. For him, passion wasn’t an abstract idea. It was a lightning bolt moment in childhood. “My passion to be a geologist hit me like a

rock at 9 years old in my fourth-grade science class,” he said.

Though he once considered art and design, geology never let him go. “Given my skills in art, including cartooning and industrial plan drawing, I considered pursuing employment opportunities in those fields instead. But I took geology courses in college, and my passion for learning in this field overwhelmed the other potential choices” he recalled. Ted describes the timing of his entry into the industry as lucky: graduating in 1979, when jobs were plentiful and opportunities came quickly. But he is just as quick to acknowledge how hard downturns hit others, sharing the story of a colleague who was let go after just a few months but persisted by working as a mud-logger and GIS expert until finally landing a geology role. To Ted, that persistence is as important as passion.

FINAL THOUGHTS

Looking back, Ted points to maturity and perspective as his most valuable tools. “Failures became valuable learning opportunities,” he said, and listening -especially to different opinions- became central to his decision-making.

Equally valuable was the expansion of his professional network. Working alongside different companies and experts broadened his perspective and introduced him to new ways of thinking. He recalled how the relationships built in those years often carried forward, creating connections that strengthened his career long after the projects ended.

Now, with decades of experience behind him, Ted finds fulfillment in giving back. “I have accomplished everything I wanted to and now enjoy sharing knowledge and mentoring everyone I can, from my grandkids to aspiring geologists,” he said. His voice carries not pride so much as gratitude, a sense of meaning in passing along lessons learned the hard way, and in inspiring others to chase their passions just as he chased his. ■

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FRIEDEMANN BAUR, HGS member since October 2024

Dr. Friedemann Baur's path into geology and, ultimately, basin modeling, was shaped by a desire for a career that combined outdoor work with scientific rigor. Growing up in western Germany and attending a Waldorf school, he was immersed early in a holistic learning environment that emphasized creativity, nature, and experiential learning. His academic interests led him to geology, but it wasn't until an industry internship in Brazil that he realized the practical applications

of his geological education in the oil and gas sector. A pivotal moment followed when Carolyn Lampe from Integrated Exploration Services (IES) presented on basin modeling, sparking a lasting fascination. This interest culminated in a master's thesis, a role at IES, and eventually a PhD in basin modeling and geochemistry, solidifying his technical foundation in petroleum systems analysis.

Throughout his career, Friedemann has moved fluidly across roles in software development, exploration, appraisal, and development. At IES, he approached software development from a geologist's perspective, helping to integrate complex structural tectonics into basin models. During his time at BP, he contributed across three distinct assignments, applying basin modeling, seismic interpretation, stratigraphy, and geochemistry to assess petroleum systems. In his development role, he focused on well planning, an area outside his primary expertise but one that deepened his understanding of primary data sources beyond seismic. These experiences converged when he joined Chevron, where he returned to his core passion for basin modeling within both exploration and R&D contexts. As he notes, "A key commonality among these roles is the focus on understanding the subsurface and its geological processes."

Among his most notable contributions is the development of a new kinetics model to improve API gravity prediction in PetroMod. Understanding that accurate API gravity prediction is critical to evaluating petroleum systems, he set out to create a model that could better simulate fluid properties in numerical basin models. "It took several unsuccessful attempts before I found a working solution," he explained, emphasizing the iterative nature of the work. Through this work, Friedemann has demonstrated how targeted innovation in geochemical modeling can significantly enhance the predictive power of basin analysis tools.

Outside of work, he finds balance through his passions for visual arts, electronic music, and motorsports- interests he actively pursues in Houston. As a new member of the Houston Geological Society, Friedemann is eager to deepen local professional connections, noting that organizations like HGS offer unique opportunities to learn about geology and network with like-minded people. ■



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Energy companies are dealing with large amounts of continuously growing data and poorly connected workflows across multiple applications. Companies are looking to leverage AI and Machine learning for better comprehensive analysis for green and mature fields. This talk covers latest AI tools that geologists and petroleum engineers can use to compliment and augment their scientific workflows. I will also share practical approaches to leverage AI tools for improved data discovery, address data quality issues, leverage data driven techniques and widely proven ML techniques for subsurface modeling and reservoir monitoring.

Monday 29 September | 5:30 – 8:30

Spaghetti Western, 1608 Shepherd Drive, Houston, TX 77007

Cost: \$45 Members, \$55 Non-members, \$40 Students

Includes buffet dinner and two drink tickets

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Sashi Gunturu



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SIPES HOUSTON
ENERGY ENTREPRENEURSHIP

SIPES: Beyond Physics in Geophysics

Physics is an essential component of geophysics but there is much that physics cannot know or address. The laws of physics are applicable everywhere, and thus a single negative example is sufficient to falsify any scientific hypothesis. It is therefore natural to assume that a geophysical method must similarly be valid every place to be credible. However, geological correlations are not universal, local geological relations can be incorporated into seismic analysis, and a given methodology may work locally, even if it is not valid anywhere else. Thus, geophysics can go beyond physics by putting the GEO back into the equation. As a general rule, the more geological information that can be properly incorporated into a geophysical prediction, the better.

For the past quarter-century, explorationists have successfully empirically used seismic multi-attribute regression analysis and neural networks to make predictions that physics alone cannot achieve. More recently, deeper neural networks are being employed to perform a variety of geophysical functions. This machine learning has great promise, and as it is entirely data driven can readily go beyond physics, but can also be readily misapplied and abused when used to directly make predictions, especially given the usual paucity of local training data.

An alternative approach is to use machine learning to uncover relationships that may not have been foreseen because they were not readily apparent or addressed using physics alone. Once these relationships are found and understood geologically and geophysically, they can be used to predict rock and fluid properties from seismic data.

Application of science guided machine learning (and machine-learning guided science) is demonstrated in a variety of case examples from Mexico, China, and the Permian Basin. ■

Date & Location:

Thursday, September 18th
Petroleum Club

Time:

Wine Served 11:00am
Lunch Served 11:30am

Purchase Ticket:



Speaker:

John Castagna
University of Houston

John Castagna holds the Sheriff Endowed Chair in Exploration Geophysics at the University of Houston. After receiving his PhD from the University of Texas at Austin, he worked 15 years for Arco Oil and Gas in various capacities, and the past 30 years as a professor. His main research interest is predicting rock properties from seismic data.

Emerging Plays and Activity Highlights Around Select Lower 48 Basins

As core inventory in primary zones continues to deplete across the main basins and plays, operators looking to add additional economic inventory locations to their portfolio are testing a variety of zones, both old and new, with varying degrees of success. Whether it's testing out new benches in old areas, testing old benches in new areas, or extrapolating learnings and play concepts from one basin to another, this talk will dive into some of the "up and coming" plays that operators are focusing on in the Permian, Mid-Continent, and beyond. ■



He has worked on numerous deals in the middle market across every basin and play in the lower 48.

Prior to joining Detring Energy Advisors, Bryan worked as a geologist for Tapstone Energy and Chesapeake Energy where he evaluated both conventional and unconventional plays of the Midcontinent.

BIOGRAPHICAL SKETCH

BRYAN BOTTOMS joined Detring Energy Advisors in August 2019 and currently serves as Director of Geology for the firm.

Bryan holds a BS (2012), BA (2012), and MS (2017), all from the University of Arkansas. Bryan is a registered Professional Geologist in the state of Texas.

Houston Geological Society
STUDENT EXPO
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September 15-16, 2025
Houston, TX

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5:30 – 8:00 p.m.

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Students \$40 • Non-Members & Walkups \$55

New location – Spaghetti Western

1608 Shepherd Drive, Houston, TX 77007

Park in lot behind restaurant

Includes buffet dinner and two drink tickets

<https://www.hgs.org/civicrm/event/info?id=2666>

Event Contact: Andrea Peoples

HGS General Dinner Meeting

Sashi Gunturu

HGS General Dinner Meeting

AI for Geoscientists: Leverage AI Tools, Cloud and Edge Computing for Faster Energy Data Insights

Energy companies are dealing with large amounts of continuously growing data and poorly connected workflows across multiple applications. Companies are looking to leverage AI and Machine learning for better comprehensive analysis for green and mature fields. This talk covers latest AI tools that geologists and petroleum engineers can use to compliment and augment their scientific workflows. I will also share practical approaches to leverage AI tools for improved data discovery, address data quality issues, leverage data driven techniques and widely proven ML techniques for subsurface modeling and reservoir monitoring. ■

BIOGRAPHICAL SKETCH

SASHI GUNTURU is the Founder & CEO of Petrabytes Corporation that provides Data & AI solutions for the energy sector. With



strategic partnership with Amazon Web Services, Petrabytes is enabling energy companies to process massive amounts of data at scale to generate faster, actionable insights. Prior to Petrabytes Corp, Sashi worked as an independent project consultant with Reservoir Technology

Group at Baker Hughes and in different roles with Geomechanics International including upstream software development and consulting. Sashi received his MS in Petroleum Engineering and MS in Computer Science from University of Tulsa, Oklahoma, USA and Bachelor of Technology in Chemical Engineering from Andhra University, India.

Houston Geological Society
STUDENT EXPO

VOLUNTEERS NEEDED

Calling all HGS members to volunteer to judge a student poster session being held at the Student Expo.

POSTER JUDGES
SEPTEMBER 15
8AM - 9AM
COFFEE PROVIDED

SIGNUP: JUDGE@STUDENTEXPO.ORG

NORRIS CONFERENCE CENTER, CITYCENTRE, HOUSTON, TX



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Thursday, October 23, 2025
The Golf Trails of the Woodlands

SEPTEMBER 2025

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 	2	3	4	5	6
7	8	9	10	11	12	13
14	15 HGS Annual Student Expo https://www.hgs.org/civicrm/event/info?id=2625	16	17	18 SIPEs Luncheon <i>SIPEs: Beyond Physics</i> <i>in Geophysics</i> Page 39 https://sipeshouston.org/events/ HGS NeoGeos Happy Hour - Trivia Night! Page 18 https://www.hgs.org/civicrm/event/info?id=2648	19	20
21	22	23	24 HGS General Luncheon Meeting <i>Emerging Plays and Activity Highlights Around Select Lower 48 Basins</i> Page 40 https://www.hgs.org/civicrm/event/info?id=2665	25	26	27
28	29 HGS General Dinner Meeting <i>AI for Geoscientists: Leverage AI tools, Cloud and Edge Computing for Faster Energy Data Insights</i> Page 41 https://www.hgs.org/civicrm/event/info?id=2666	30			RESERVATIONS The HGS prefers that you make your reservations online 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, contact the HGS office at OFFICE@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.	

INSTRUCTIONS TO AUTHORS

Materials are due by the first of the month for consideration to appear in the next month's publication. Submissions should be emailed to editor@hgs.org. The Editor reserves the right to reject submissions or defer submissions for future editions.

Text should be submitted as a Word file. Figures or photos may be embedded in the document or submitted separately. The following image formats are accepted: tif, .jpg, .png, .psd, .pdf.

Feature submissions, e.g., Rock Record, should be approximately 600 words. Technical papers should be approximately 2000 words or less (excluding references).



THIRD ANNUAL HGS SPORTING CLAYS SHOOT



FRIDAY, NOVEMBER 21, 2025

7:30AM - 1:30PM

WESTSIDE SPORTING GROUNDS

10120 PATTISON RD., KATY, TX 77493

EARLY BIRD SPECIAL! ENDS 9/17/25

\$900 /4 Person Team

\$225 / Individual

Includes 4-man cart, 12 or 20 gauge ammo

Gun Rentals are available from the venue

**\$50 / 4 Person Flurry Competition, includes
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Door Prizes, breakfast, lunch and
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Energizing Geoscience Careers

Houston Geological Society Student Expo

Since its inception in 1998, originally under AAPG, the Houston Geological Society (HGS) Student Expo ('the Student Expo') has grown into one of the premier geoscience recruiting events in the United States, continuously adapting to meet the evolving needs of the industry and the next generation of geoscientists. Founded by Martha Lou Broussard—recently honored with the Houston Geological Society's Distinguished Service Award—the Student Expo has consistently provided numerous opportunities for students and industry leaders to connect and advance their careers within Houston, Texas, the Energy Capital of the World. In an increasingly digital world, especially post-pandemic, the Student Expo stands out by emphasizing human interaction and face-to-face networking, which was something deeply missed within the geoscience community.

ACCESSIBILITY, GROWTH, AND HYBRID OPPORTUNITIES

Over recent years, accessibility has become a central theme for Student Expo volunteers dedicated to providing as many opportunities as possible for students nationwide. From 183 student participants in 2021, attendance surged dramatically to over 300 in 2024, representing students from 34 states and 70 different universities. With student attendance rising by 65% in just four years, this highlights the Student Expo's strong reputation and growing student interest in geoscience careers, even as the industry experiences consolidation and changes in energy trends.

TALENT ATTRACTION AND RETENTION: NAVIGATING THE CHANGING ENERGY LANDSCAPE

Recruiting companies and sponsors consistently leverage the Student Expo as a critical tool for not only hiring, but also for engaging with young professionals. The Student Expo gives recruiters a unique opportunity to gauge trends and perspectives directly from students and young professionals. This insight helps everyone better adapt to evolving industry needs.

STUDENT READINESS AND INDUSTRY ALIGNMENT

The Student Expo provides unique coaching opportunities designed to refine essential soft skills, such as communication, interviewing, and presentation capabilities so students can best demonstrate their strong technical capabilities. The industry has continuously shown its readiness and enthusiasm to bring in the next generation of skilled students, demonstrating adaptability to evolving technological demands, including increased use of artificial intelligence and a sharper focus on renewable energies that are all underscored by a strong, technical, geoscience foundation.

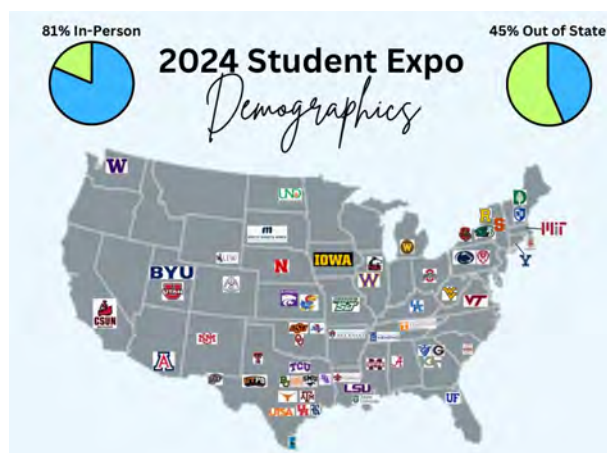
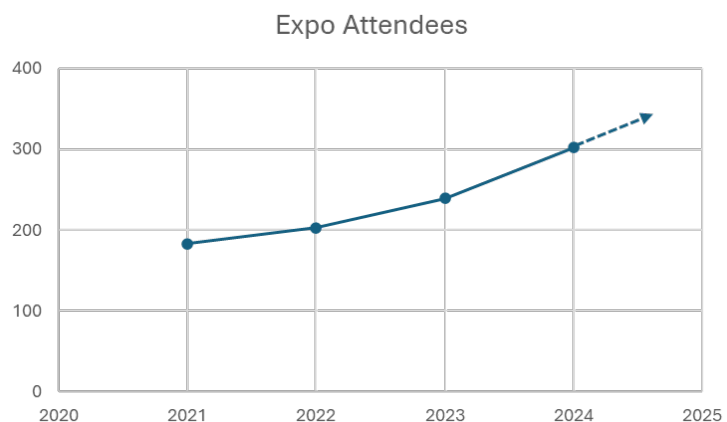
POSTER PRESENTATIONS RETURN!

One of the most anticipated developments for the 2025 Student Expo is the revival of student poster presentations, emphasizing the event's educational and professional value. Poster sessions serve as platforms for students to showcase their research, exchange knowledge, and engage directly with potential employers, reinforcing community-building within geoscience. The return of poster presentations will offer students an additional opportunity to further network with companies, while also gaining valuable feedback on their research.

WHY HOUSTON? CONTINUITY, COST-EFFECTIVENESS, AND ACCESSIBILITY

The Student Expo was started in Houston, where the city remains an ideal hub for this premier recruiting event, rooted in its status as the Energy Capital of the World. Consistency and focused outreach to students from diverse educational backgrounds, solidifies Houston's appeal and contributes to the Student Expo's ongoing success. This also allows every student, regardless of university location, to have access to a concentrated career fair where they can meet recruiters that otherwise may have been unable to travel to more distant events.

Student Expo continued on page 9



Student Expo

MEASURING SUCCESS BEYOND JOBS

Ultimately, the HGS Student Expo tries to reach as many students and universities as possible. However, success for the event extends beyond employment statistics. It's not just about helping students find the next job, but also helping them build the skillsets for success and to feel more confident with networking and interviews. A small portion of attendees are within their undergraduate studies, and the event helps them get a better idea of what the recruitment process looks like, such as how to pitch

themselves, what skillsets are the most sought-after, highlight available scholarship opportunities...etc.

2025 Student Expo Committee Members: Andrew Stearns (Chair), Julian Chenin (Vice-Chair), Amanda Johnston (Former Chair), David Lankford-Bravo, Cecilia Ramirez, Ben Dotson, Joshua Novello, Katie Fry, Jonathan Membreno, Philomena Gan, Martha Lou Broussard (Founder), and Sushanta Bose. ■





Introduction to Bore Hole Image Log Interpretation with Manfred Frass

November 6, 2025, 8am - 5pm CST

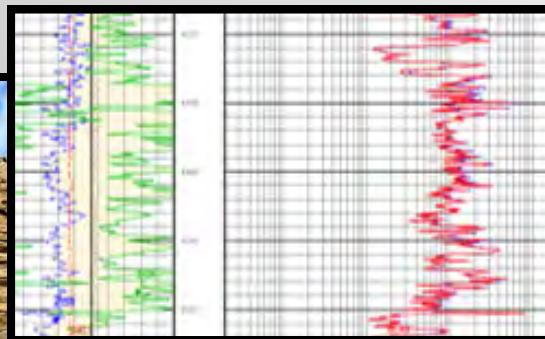
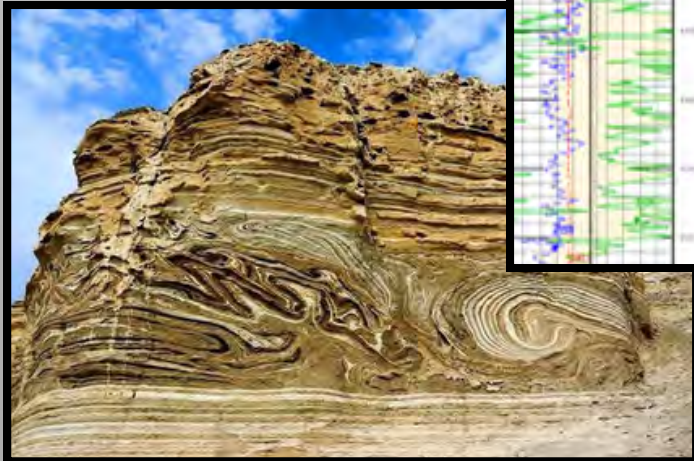
Stratum Reservoir: 5200 North Sam Houston Pkwy W #500

- HGS Members \$280.00
- HGS Student / In Transition Members \$50.00
- Emeritus \$140.00
- Non-members \$350.00

Course Description

This course gives the participants an overview and basic skills for interpreting dipmeter and formation image log data. It covers key concepts in selecting logging tools, optimizing data acquisition. Participants will explore structural and fracture interpretation and in-situ stress analysis.

- Explain the basic principles of formation image log data interpretation, including the purpose and benefits of using different formation image logging tools.
- Compare the various current formation image logging tools by discussing their theory, applications, advantages, and limitations, as well as strategies for optimizing data acquisition.
- Apply structural dip and fracture analysis techniques to interpret subsurface geological features and assess in-situ stress conditions using image logs.
- Summarize the integration of borehole images with core



Manfred Frass



*Attendees will receive a Certificate of Continuing Education for 8 PDH

Click to register or call 713-463-9476

HGS 2025 Summer Internships at the Houston Museum of Natural Science

By Dorene West (Science Fair Committee Chair) and Penny Patterson (2024-2025 HGS President), Houston Geological Society

Building on the success of last summer, the Houston Geological Society once again funded four scholarships for high school students to pursue hands-on STEM research at the Houston Museum of Natural Science, giving young scientists the opportunity to explore, create, and contribute to real-world projects. The interns worked under the guidance of Carolyn Sumners, Ed.D., the HMNS's Curator of Astronomy, who specializes in space education. The students who received internship scholarships are:

- Heba Badet: Received sponsorship by HGS in 2025. She was also an intern in 2024 partially sponsored by HGS and NASA.
- Ram Magathala: Received sponsorship by HGS in 2025. He was also an intern in 2024 partially sponsored by HGS and NASA.
- Prachi Natoo: Received sponsorship by HGS in 2025; 1stPlace Senior Division Chemistry at the Science and Engineering Fair of Houston (SEFH); 3rd Place at the International Science and Engineering Fair (ISEF). She was also an intern in 2024 fully sponsored by HGS. Prachi also received a special award from the Houston Museum of Natural Science for her work last summer by Dr. Carolyn Sumners.
- Shri Chada: Received sponsorship by HGS in 2025. She was also an intern in 2024 fully sponsored by HGS.

During the summer, Dorene West (HGS Science Fair Committee Chair) and Penny Patterson (2024-2025 HGS President) visited three of the four museum's interns. With this being the final year of the OpenSpace software grant, the interns focused on producing as many educational videos as possible for Houston Museum of Natural Science (HMNS) visitors.

The approach focuses on transforming "boring lectures" into interactive adventures. Activities include matching and scramble games, *Fly Me to the Moon*, star parties held between the quarter and full moon, the Bright Futures Fair, and expanded use of the dome's Moon movie. The interns also developed interactive games to teach key astronomy concepts, such as how celestial movements define time, mark the seasons, guide navigation, and determine location.

One favorite game, "Show What You Know for the Universe", quizzes participants on the Sun, Moon, planets, asteroids, comets, our solar system, and the Milky Way galaxy. Additional programs, developed in partnership with HISD, introduce science careers, teach time-telling using the Sun, and help visitors recognize constellations and their positions relative to Earth.

Whether through live OpenSpace explorations or pre-recorded media shows, the interns are making sure visitors learn about the universe in a way that's as fun as it is educational. Between June 2024 and June 2025, the OpenSpace Lab welcomed 42,193 visitors, with programs developed by interns Heba, Ram, Prachi and Shri outperforming other offerings by an order of magnitude. In creating these engaging experiences, the interns have gained valuable skills in software programming, troubleshooting, and system controls, while also developing teamwork, project management, and presentation abilities. Their work extends to maintaining and upgrading a 20-year-old "life-like" space expedition simulator- capable of simulating travel and landings on the Moon or Mars- which would make an excellent field trip for HGS members and their families, not only to see what the interns have accomplished, but also to enjoy learning about the universe.

ABOUT THE VISITS

On June 25, 2025, Dorene and Penny visited intern Heba Badat at the HMNS for an illustrative session using OpenSpace, an open-source interactive data visualization software designed to depict the known universe and showcase humanity's ongoing exploration of the cosmos (**Figure 1**).

Heba focused her work on creating an introduction for the study of astronomy's influence on civilizations, with connections to geology, paleontology, and archaeology. Her project highlighted the East African Rift and Olduvai Gorge in Tanzania's Serengeti Plains: one of the world's most significant paleoanthropological sites. This location has yielded critical insights into early human evolution, including evidence of tool use, hunting, scavenging, and the development of early social behaviors.

Using OpenSpace, Heba developed a visual sequence that zoomed



Figure 1. From left to right: Penny Patterson (2024-2025 HGS President), Heba Badat (HGS-sponsored summer intern), and Dorene West (HGS Science Fair Committee Chair).

from the HMNS to the expanse of the universe and back into Olduvai Gorge, illustrating the link between astronomy and the development of civilizations. The discussion also explored how geology influenced the placement of early civilizations, and Dorene and Penny shared professional insights from their own academic and career experiences within the immersive dome environment for intergalactic visualization (**Figure 2** and **Figure 3**).

The second visit, held on July 17, 2025, Dorene and Penny welcomed intern Ram for an engaging and hands-on session in the museum's immersive dome (**Figure 4**). Ram, who is currently preparing to submit an exoplanet research paper for publication based on his 2024-2025 SEFH projects, has been working on streamlining astronomy presentations for visitors. He is also working on models that demonstrate the consequences of time dilation in space, a valuable insight that can help scientists and researchers alike to measure how catastrophic space travel gets the faster we move.



Figure 2. From right to left: Heba Badat (HGS-supported summer intern) showing Penny Patterson (2024-2025 HGS President) and Dorene West (HGS Science Fair Committee Chair) the observable universe sphere with blue and red whispers of light from the big bang sound wave (cosmic microwave radiation, whispers of light butterfly and gap behind the Milky Way, energy from formation of the universe).



Figure 3. Constellation outlines on our galaxy. From left to right: Dorene West (HGS Science Fair Committee Chair), Penny Patterson (2024-2025 HGS President), Carolyn Summers (Vice President for Astronomy/Curator of Astronomy HMNS), and Heba Badat (HGS-supported summer intern).

Every dome presentation begins with a view from the Houston Museum of Natural Science, then zooms outward to reveal the Milky Way galaxy, complete with cosmic clouds and background. From there, the journey continues past newer stars at the galaxy's center (**Figure 5**), on to the International Space Station, Jupiter's swirling storms, and the craters of our Moon, before returning to Earth to explore Mount Everest and the African Serengeti, a cradle of human evolution. Using OpenSpace, Ram built upon the introduction created by fellow intern Heba Badat earlier this summer.

The third visit, on July 30, 2025, intern Prachi Natoo (**Figure 6**) welcomed Dorene and Penny for what was meant to be a quick visit, but turned into a lively three-and-a-half-hour tour of the OpenSpace Lab! Continuing the theme of making astronomy learning fun, Prachi eagerly demonstrated several interactive games, including her determined attempt to get them to try the Matter & Motion Scavenger Hunt (**Figure 7**).

Prachi shared upcoming plans for August meteor-viewing events and dome-based Moon explorations, both using the OpenSpace software.



Figure 4. Clockwise: Ram Magathala (HGS summer intern), Elise Bernadac, Cartar Boland, Carolyn Summers (HMNS VP Astronomy), Shri Magathala (Ram's sister), Emma Chen, Emily Chow, and Akhil Rajarathnam.

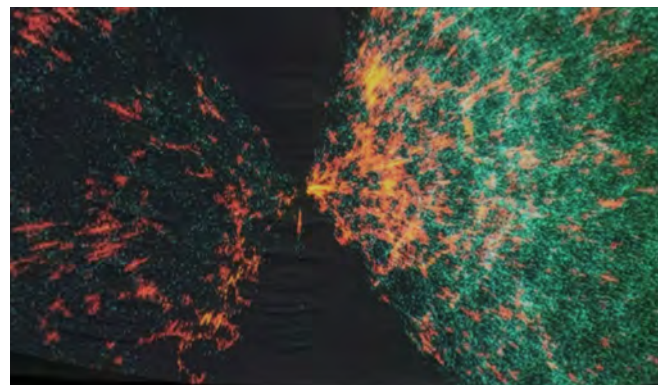


Figure 5. Cosmic Microwave Background (CMB) whispers of light butterfly and gap behind the Milky Way galaxy. The reason for the gap (dark triangles) is that we can see no CMB (for the observable universe) in the shadow of our galaxy.

TEN WAYS HMNS STUDENTS ARE SHAPING OPENSOURCE EXPERIENCES

Dorene and Penny also had the opportunity to watch the Houston Museum of Natural Science's presentation at the Dean Astronomy Lecture Series via Zoom. The session, led by Carolyn Sumners and the interns, focused on dome programming, primary platforms for OpenSpace content, and HMNS OpenSpace 2025 goals. They also showcased other OpenSpace presentations from institutions across the U.S., and HMNS's work clearly set a high bar for others to match.

The HMNS team demonstrated how they have used OpenSpace to create engaging learning videos and interactive games for the public, built around ten specific goals:

1. Taking the new OpenSpace GUI on the road to the Bright Futures Fair and as a GeoDome exhibit. HMNS interns participated at the NRG Arena using a painted dome (Digistar produced/warped).
2. Combining OpenSpace simulations with media show video and animations depicting past and future events.



Figure 6. From left: Prachi Natoo (HGS summer intern), Dorene West (HGS Science Fair chair), and Emma Chen.



Figure 7. Prachi Natoo (HGS intern, standing) demonstrating OpenSpace controller/navigation issues to Dorene.

3. Creating interactive Moon-watching programs such as *Connect*, *Moon Match*, *Fly to the Moon*, *Moon Quiz*, and *Scramble*.
4. Producing an OpenSpace introduction and editing the IMAX Africa movie, focusing on the East African Rift and Olduvai Gorge paleoanthropological site.
5. Completing the Science Careers program and creating a career hunt in the museum (in partnership with HISD).
6. Completing two new programs and updating four others for the OpenSpace Lab.
7. Finishing the sustainable Space Garden project and launching its website.
8. Developing the "Stars of Islam" program in OpenSpace, highlighting the role of astronomy in Islamic and other early civilizations.
9. Rewiring and repairing robots in the Expedition Center (**Figure 8** and **Figure 9**).
10. Creating interactive programs for the Science Lab and Solar Cart.

EXPLORING THE UNIVERSE: INTERN ACHIEVEMENTS IN OPENSOURCE

Using OpenSpace software, the interns have demonstrated remarkable creativity and scientific insight (**Figure 10**). Their work revealed that the alignment of the stars with the pyramids of Egypt- explored in collaboration with the Rice University Planetarium- is far from coincidental. They are developing interactive programs that allow visitors to explore the night sky from any planet, illuminating global development and integrating



Figure 8. From left to right: Emma Chen, Sophie Dai, Elise Bernadac, Prachi Natoo (HGS summer intern) in Simulation Lab (Expedition Center) (Dorene in foreground)



Figure 9. From left to right: Carolyn Sumners (HMNS VP Astronomy), Dorene West (HGS Science Fair chair), Prachi Natoo (HGS intern), Sophie Dai, Emma Chen, Elise Bernadac in Simulation Lab (Expedition Center).

OpenSpace map insets for context. Through the alliance with Rice University, they have shown that Pluto's and Terra's orbits are stable enough to conceptually “bridge” the two worlds. The interns have also designed features to flip planets and display the night sky from each pole, revealing, for example, that Saturn and Neptune share similar tilts and night sky views to Earth. By highlighting the importance of the big picture in space navigation, they underscore why precision is critical for early space travel, a lesson informed by the setbacks of past Moon and Venus missions.

Beyond astronomy, the interns are also working on a greenhouse project to experiment with growing plants in space-like conditions. They are testing germination and survival in extraterrestrial soil substitutes, with succulents showing promising resilience (**Figure 11**). These experiments explore both potential space agriculture and new approaches to cultivation here on Earth.



Figure 10. Some of the available videos to play made by HMNS summer interns over the years.



Figure 11. From left to right: Elise Bernadac, Shri Magathala, Ram Magathala (greenhouse in the background). Below greenhouse project plants.

EARTH SCIENCE WEEK

OCTOBER 12 - 17, 2025

ENERGY SCIENCES FOR OUR FUTURE



With the Houston Museum of Natural Science, the **Houston Geological Society (HGS)** will be sponsoring an ESW event at the Museum on *Saturday, October 11, from 10:00 a.m. to 2:00 p.m.* in the Paleontology Hall Lobby. This event is free with admission to the Museum.

The HGS event will have stations that will help participants of all ages explore Texas Geology, Micropaleontology, Fossil Wood, and Everyday Uses of Common Rocks and Minerals. There will also be rock and mineral giveaways for youngsters and a limited number of Earth Science Week resources kits available to educators.

For more information about the global event or to obtain a free educator's resources kit from the American Geological Institute go to <https://www.earthsciweek.org/>.

If you are interested in volunteering to help during the HGS event at the Museum, please contact Barbara Hill at bhill13090@gmail.com.

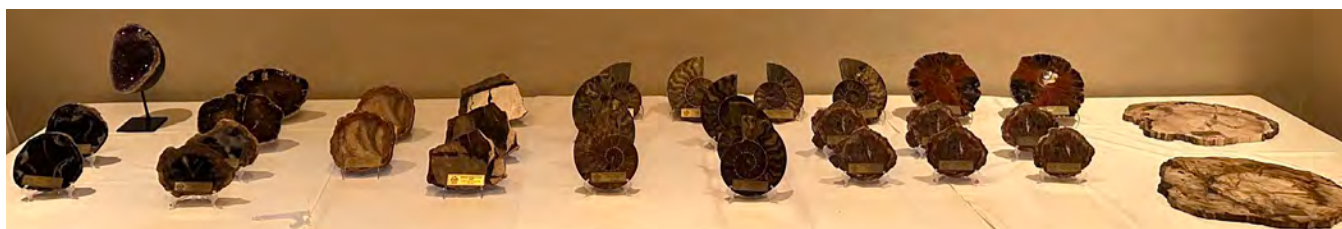


2025 President's Night Dinner and Awards Ceremony

By Penny E. Patterson, Andrea Peoples, and Magly Cabrera

The Houston Geological Society hosts the President's Night Dinner and Awards Ceremony every year in June, which is the end of the HGS's fiscal year, to recognize all the individuals that have contributed to the success of HGS over the past year. This year the President's Dinner was held on June 24, 2025 at Perry's Steakhouse in Memorial City. At the President's dinner, HGS recognized and honored HGS corporate sponsors, as well as HGS Board members, committee members and volunteers for all their contributions to the society over this past year. It was a fun-filled evening with much laughter and smiles reminiscing the past year's events and many heartfelt thank-you remarks extended to everyone who helped make the 2024-2025 year so successful!

The HGS Board extends a sincere thank you all that submitted recommendations for this year's HGS awards. The HGS Board received numerous outstanding recommendations, which reflects on the strong commitment that HGS members and volunteers have to support and advance HGS on its mission to be the premier geoscience organization.



CORPORATE STAR AWARDS

The Houston Geological Society extends a sincere thank you to the many corporate sponsors that have made contributions to HGS this past year. Corporate sponsors are vitally important for HGS to organize and host technical meetings, joint conferences, scholarship programs, training courses, and social events. This year HGS recognized the following Bronze, Silver, and Gold Corporate Star Awards.

BRONZE

Rogii

Accepting the award, Travis Hagler

SeisWare

unable to attend dinner

SILVER

Murphy Oil Corporation

Accepting the award, Chris Olson

ExxonMobil

Accepting the award, Stacie Gibbins

GeoMark Research

Accepting the award, Graham Spence

Tri-Star Group

Accepting the award, Bruce Blake

GOLD

Shell

Accepting the award, Angela Hammond

Chevron

Accepting the award, Bill Wilcox

Oxy

Accepting the award, Taskin Akpulat

Houston Energy

Accepting the award, Jim Saye

Thunder Exploration

Accepting the award, Walter Light, Jr.

2025 President's Night Dinner and Awards Ceremony



BRONZE CORPORATE STAR AWARD
Rogii
Accepting the award, Travis Hagler



SILVER CORPORATE STAR AWARD
ExxonMobil
Accepting the award, Stacie Gibbins



SILVER CORPORATE STAR AWARD
GeoMark Research
Accepting the award, Graham Spence



SILVER CORPORATE STAR AWARD
Tri-Star Group
Accepting the award, Bruce Blake



GOLD CORPORATE STAR AWARD
Shell
Accepting the award, Angela Hammond



GOLD CORPORATE STAR AWARD
Chevron
Accepting the award, Bill Wilcox



GOLD CORPORATE STAR AWARD
Oxy
Accepting the award, Caroline Wachtman



GOLD CORPORATE STAR AWARD
Houston Energy
Accepting the award, Jim Saye



GOLD CORPORATE STAR AWARD
Thunder Exploration
Accepting the award, Walter Light, Jr.

2025 President's Night Dinner and Awards Ceremony

RISING STAR AWARDS

The Rising Star Award honors individuals who are relatively new to HGS or have recently made significant contributions to the enhancement and success of the Society. This year the HGS Board recognized six individuals that truly had an important impact on the success of HGS over this past year. HGS is honored to present the Rising Star Award to the following individuals.



ALLISON BARBATO recently moved to Houston and, immediately upon her arrival, she has contributed greatly to the success of Scholarship Night. In 2025, Allison assisted Fang Lin as Co-Chair of Scholarship Night, which was an extremely successful event with raising over \$55,000 for the graduate student Calvert Scholarship Fund and the undergraduate Houston Geological Society Scholarship Fund. Allison has taken over the reins and in 2026 Allison will Chair the committee for Scholarship Night. Allison was a Calvert Scholarship Award winner herself and her knowledge of HGS's Scholarship Night and her organizational skills will greatly benefit HGS's future Scholarship Night Ceremonies.



AUSTIN BRUNER has Co-Chair the NeoGeos Committee for the last two years. Over that short time, Austin has advanced the NeoGeos networking group into an extremely successful social platform geoscientists at all stages of their career to mingle, mentor, and enjoy each other's camaraderie.

ALEX STAUB is also a Co-Chair of the NeoGeos Committee. For the last two years, Alex and Austin worked together to make the NeoGeos such a successful social gathering that highlights the importance of networking in our geoscience community to learn from each other and exchange and develop new concepts for our global geoscience advancement.



MAGLY CABRERA has been an invaluable asset for HGS this past year. Magly has helped with numerous HGS dinner meetings and social events through assisting with in-person registrations and working behind the scenes to ensure that everything goes smoothly for each function. In addition, Magly has taken on the role of photographer for HGS's events and meetings. The photographs that you see in this article are all thanks to her hard work. When you look at the photographs you will see that Magly has an artistic eye and a gift for making us all

look exceptional!



ROBIN FERNANDEZ has worked diligently with Magly Cabrera and Andrea Peoples, HGS Office Manager, in the organization of registrations for HGS technical dinner meetings as well as for several HGS social events. Robin has been instrumental in keeping HGS meetings and social events run smoothly.



LARRY WELCH has been an active volunteer for HGS for a number of years and just recently Larry became a member of HGS. Larry has been a critical volunteer for HGS's participation in the Science and Engineering Fair of Houston (SEFH). This year Larry was an HGS Special Award Judge. In addition, he assisted with hand-

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making the special HGS awards for each of the winning students, and was the photographer for HGS's student winners at the SEFH competition. Larry also took all the photographs of HGS's summer interns at the Houston Museum of Natural Science (see the SEFH article in this month's HGS *Bulletin*).

CHAIRMAN'S AWARD

The Chairman's Award honors members who have made extraordinary efforts or unique contributions to their committee. These members deserve special recognition for all that they have done this year. HGS is honored to present the Chairman's Award to Bill DeMis and Shannon Lemke.



BILL DEMIS has been a long-time dedicated member of HGS. Over the past several years, Bill has worked with Angel Callejon and Thom Tucker on the Continuing Education Committee (CEC), which organized and conducted



seven well-attended HGS short courses on critical technology. These courses have enabled our HGS members to learn about evolving concepts and methods in our geoscience community. Bill's contributions to CEC have set a new standard for future

events. In addition, Bill is HGS' champion for helping increase HGS's memberships. Bill will be an HGS Director in 2025-2026 and we look forward to his continued dedication and contributions to HGS.

SHANNON LEMKE joined HGS in 2000 and has been an enthusiastic supporter of HGS. Shannon has served in several positions on the HGS Board and committees. Shannon was the HGS Board Secretary for the term 2012 to 2013. In addition, Shannon was the Secretary for the HGS Foundation from 2009 to 2023. This year the Foundation awarded five scholarships to undergraduate students. HGS is pleased to present the Chairman's Award to Shannon Lemke for her many years of continued service and contribution to HGS.

DISTINGUISHED SERVICE AWARD

The HGS Distinguished Service Award honors members who have given long-term invaluable service to HGS that has helped build HGS as a premier resource and networking organization for our geoscience community. The HGS Board is proud to recognize Martha Lou Broussard and Fang Lin for this exceptional award.



MARTHA LOU BROUSSARD is well-deserving of HGS's Distinguished Service Award. Martha Lou is the Founder of the

Student Expo, which is HGS's extremely successful recruiting and networking event hosted for our young geoscience community members. Martha Lou initiated the concept of Student Expo in 1998, while campaigning for election as Vice President of AAPG. In that campaign she promised to help students in their efforts to obtain employment. True to her words upon being elected VP of AAPG, Martha Lou established Student Expo through AAPG. In the first year, Student Expo hosted nine companies with 60 students attending the event. Student Expo was hosted by AAPG from 1998 to 2020 and was held at Rice University and subsequently at the GRB Convention

Center. In 2021, HGS took the opportunity to host Student Expo and selected the Norris Conference Centre for the event location. Over the years, the Student Expo has evolved into the largest geoscience job fair in the United States. It offers a unique platform for geoscience industries and students to network while focusing on recruitment. Because Texas is a major hub for various geoscience industries, Student Expo has received tremendous support from both the energy industry and our geoscience students. HGS proudly presents the Distinguished Service Award to Martha Lou Broussard for her inspiration of and commitment to Student Expo and her many years of service and

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support of our young geoscientists in their endeavors to discover their future employment opportunities.

FANG LIN joined the Houston Geological Society in 2007 and has been an active and distinguished HGS member for many years. Fang has held numerous HGS Board positions, including HGS Editor-Elect (2018 - 2019), HGS Editor (2019 - 2020), HGS Treasurer-Elect (2022 - 2023), and HGS Treasurer (2023 - 2024). Fang's exceptional service to HGS is her work as Chair of HGS Scholarship Night. Fang has been Scholarship Night Chair for the last three years. Through Fang's leadership, HGS Scholarship Night is a



highly successful HGS dinner meeting, in which HGS celebrates the recipients of

PRESIDENT'S AWARD

President's Award honors members whose extraordinary efforts or unique contributions in a fiscal year or over a short period of time deserve special recognition. The HGS Board is proud to recognize Chuck Caughey and Dorene West for this exceptional award.



Chuck has been a volunteer at the Science and Engineering Fair of Houston and has been actively helping students learn about career opportunities in geoscience.

CHUCK CAUGHEY has been a long-time committee member of HGS's Educational Outreach Program, and he currently serves as Chair of the committee. Chuck has been an inspiring volunteer leading the educational program for over 15 years. He has led the subsurface core program at the Rock Labs event held at BEG in Austin for many years. At this event, Chuck teaches students about sedimentary structures, reservoir potential and hydrocarbon presence to help STEM high school students learn about geology and its application. Chuck has also helped with curating HGS's teaching sample collection. In addition,



DORENE WEST is well-deserving of HGS's President's Award. Dorene is a dedicated HGS volunteer and representative for the Science and Engineering Fair of Houston (SEFH). Dorene has served as Chair of the SEFH committee for several years. In her roles as SEFH Committee Chair, Dorene reads all the student abstracts and selects SEFH projects for judging that have connection to geology or earth science. Dorene

the Calvert Graduate Scholarship Awards and the HGS Foundation Undergraduate Scholarship Awards. This year the Calvert Foundation awarded scholarships to nine Ph.D. and M.S students, and the HGS Foundation awarded scholarships to five undergraduate students. In addition, Fang organized geoscientists from Chevron to give featured presentations spanning from informative geologic field studies to seismic stratigraphy of the Chicxulub meteor impact. HGS proudly presented the Distinguished Service Award to Fang Lin for her many years of dedicated service to HGS and her commitment to excellence for our geoscience community.

organizes well-qualified HGS volunteers to judge student geoscience projects, and at the completion of the event, Dorene and the HGS judges present the awards to each of the top students in the junior and senior divisions. This year HGS presented awards to 12 exceptional students and each award winner received a copy of the "Roadside Geology of Texas" book, which were donated by Dorene and Larry Welch. Dorene also provides follow-up publicity materials and congratulation letters to the recognized students which are shared with HGS, the students, the student's teachers, and the student's parents.

In addition, Dorene serves as a representative to HGS's internship program at the Houston Museum of Natural Science (HMNS). In her role as the HGS representative, Dorene works closely with Carolyn Sumner, HMNS VP of Astronomy, to help students who have received HGS's two-week internship program at HMNS. During the student's internship, Dorene mentors the students and helps them grow in their understanding of our earth and our planetary system.

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OUTSTANDING BOARD MEMBER AWARD

The Outstanding Board Member Award honors HGS Board members who have worked unwaveringly and diligently over the course of the HGS Board's fiscal year to build HGS as a premier resource and networking organization for our geoscience community. This year HGS proudly recognizes Catie Donohue and Ted Godo for their exceptional service to HGS.



CATIE DONOHUE truly set new standards for the position of Vice President for HGS and, hence is well-deserving of receiving the Outstanding Board Member Award. During her tenure as HGS Vice President, Catie organized the speaker program and worked diligently hosting HGS's monthly technical dinner and luncheon meetings and conferences. Catie took on bold initiatives to revitalize HGS's technical programs by compiling a diverse slate of speakers and bringing in speakers to talk on innovative topics and new concepts and technologies in our geoscience community. Catie also changed the meeting formats to include panel discussions and moved the location for the meetings to enable geoscientist from around the Houston area to attend the meetings. In addition, Catie's work with

Bill Dickson was pivotal for HGS to host the 2024 Africa Conference that was held jointly with GESGB. Catie and Bill worked tirelessly to develop an outstanding speaker program and conference that was well attended and financially successful for HGS. It is with great honor that HGS presents Catie Donohue the Outstanding Board Member Award.



TED GODO is extremely deserving of the HGS Outstanding Board Member Award through his exceptional work as Editor for the *HGS Bulletin*. In July 2023, Ted was elected to the HGS Board position of Editor – Elect for the *HGS Bulletin*. In July 2024, Ted took over the HGS Board position of Editor of the *HGS Bulletin* and at that time, he boldly took on the challenge to launch the *HGS Bulletin* to a higher

level of technology and research exchange for our geoscience community, thereby building a strong networking platform for scientific and social engagements. Through Ted's focused efforts, he has positioned the *HGS Bulletin* as a key resource for innovative technical articles. Over the course of his one-year tenure as HGS Editor, Ted published 12 pioneering articles in the *HGS Bulletin*. Moreover, these 12 technical articles covered diverse geoscience topics and areas of expertise. For example, Ted's articles spanned from classic petroleum geoscience studies, as in his publication "Search for Another East Texas Oilfield in the GOM", to an interview-style article on geoscientist's personal perspectives on the oil industry in the article "Characteristics of Oil Finder", and, finally, to a publication on future critical mineral exploration in the article "Smackover Limestone - Providing Bromine and Lithium Elements". These diverse articles document Ted depth and breadth of geoscience expertise and, in addition, his ability to clearly communicate these innovative topics to initiate informative and lively discussions within our geoscience community. It is with great honor that HGS presents Ted Godo the Outstanding Board Member Award.

HONORARY LIFE MEMBERSHIP AWARD

Honorary Life Membership honors members who have distinguished themselves in the science of geology or have contributed outstanding service to the success and welfare of this organization. The honoree must have received the HGS Distinguished Service Award. This year HGS proudly recognizes Walter S. Light, Jr. for the Honorary Life Membership Award for his leadership and exceptional service to HGS.

WALTER S. LIGHT, JR. joined HGS in 1977 and has been an active HGS member ever since joining the society. Walter has served HGS in a number

of positions. In 2022-2023 he served a one-year elected term as President of the Houston Geological Society. During his tenure as HGS President, he was the

driving force behind moving HGS into financial sustainability. For several years, HGS had been operating with significant negative cash flow budgets. Walter made



significant changes to HGS's budgets, cost structures, and helped with restructuring unprofitable programs. Through Walter's keen business acumen, he set forth guidelines and sound financial formats for HGS Board members and HGS committee chairs to follow. Walter set the example for subsequent HGS President to follow, which was to continue to refine and improve HGS's budget process to achieve a positive cash flow position. The two HGS Presidents that followed Walter's term embraced Walter's drive and commitment

and ultimately transformed HGS into a financially sound geoscience organization. Finally, HGS is sincerely thankful to Walter and his company, Thunder Exploration, for their invaluable financial contributions to HGS's technical meetings, conferences, short courses and social events. It is with sincere appreciation and great honor that HGS presents Walter S. Light, Jr. the Honorary Life Membership Award.

GERALD A. COOLEY AWARD

The Gerald A. Cooley Award honors the memory of the man we remember as the personification of dedication, service and leadership continuing long after official office terms expire. It recognizes true dedication to the profession of petroleum geology in general, and to the Houston Geological Society in particular. The award honors those who have continued to serve the society well above and beyond the call of duty over many years. A candidate must have received both the Distinguished Service and Honorary Life Membership Awards to be eligible for consideration. It is the Society's highest award. This year HGS proudly recognizes Paul Britt for the Gerald A. Cooley Award for his extraordinary service to HGS.



PAUL BRITT has been a pillar in the Houston Geological Society for many years. Paul has served in numerous board and committee positions, and has helped guide HGS in its mission of being a premier geoscience organization. The

list of HGS Board positions that Paul has held impressively long. Paul has served as President (2023-2024), President-Elect (2022-2023), Bulletin Editor (2005-2006), Vice President (2001-2002), Treasurer (1995-1996), Treasurer-Elect (1994-1995), Director/Executive Committeeman (1997-1999). In addition, Paul has served on numerous committees and also served as committee chairs. Through Paul's dedication and commitment to HGS, he has been the recipient of several HGS awards, including Lifetime Honorary Membership Award (2005), Distinguished Service Award (1998), and President's Award (1994). During Paul's tenure as President of HGS, he located a new office space for HGS and negotiated an exceptional rental rate that was well within HGS's financial sustainability goals. Paul further lowered HGS office expenses

by changing to more cost effective base-business services, i.e. phone, internet, etc. In addition, Paul recruited HGS members to help move the office to its new location. This was, yet again, another example of Paul's cost savings measures to keep HGS moving toward financial sustainability. Paul now serves as HGS Chair of Office Management, where he is working diligently with Andrea Peoples to help guide HGS to achieve its financial goals and "keep HGS's lights on and the doors open". The 2024-2025 HGS Board is very proud to recognize Paul Britt with the Gerald A. Cooley Award, which is the highest award presented by HGS and recognizes Paul's significant contributions to HGS over his decades of service to HGS. ■

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CLOSING REMARKS

At the close of President's Dinner, outgoing HGS Board Members for the 2024 – 2025 year were recognized for their service to HGS and received thank-you awards for their contributions. Outgoing HGS Board Members recognized included Sharma Dronamraju, HGS Director (2023 - 2025), Judy Schulenberg, Director (2023 - 2025), Glenn Lowenstein, HGS Treasurer (2024 - 2025), Sophie Broun, HGS Secretary (2024 - 2025), and Penny Patterson, HGS President (2024 - 2025).

Penny Patterson sincerely thanked John Tubb for encouraging her to run for election and serve on the HGS Board as HGS Director (2014-2016), which led to serving HGS in several positions over the many years.

The President's Dinner closed with Penny Patterson, outgoing HGS President (2024 - 2025) passing the traditional HGS rock hammer to Patty Walker, incoming HGS President (2025 - 2026). Penny then expressed to Patty and the incoming HGS Board all good wishes with a successful and prosperous year as they embark on their upcoming journey!



In Memoriam

We extend our deepest condolences to the families and communities affected by the devastating floods that struck Texas on July 4th of 2025. The loss of life and widespread destruction serve as a solemn reminder of the power of nature and the vulnerability of those in its path. As geoscientists, we stand in solidarity with all those impacted, and we honor the memory of the victims with compassion and respect. May their lives be remembered, and may our work continue to contribute to a deeper understanding of the natural world in the hope of building a safer future for all.



Picture taken from <https://wallpapersafari.com/w/vRpb8I>

Remembrance

THOMAS K. BJORKLUND

JANUARY/23/1938 - JULY/02/2025



THOMAS KEITH BJORKLUND passed away on July 2, 2025 at the age of 87 in Davis, CA. Born in Albion, NE in 1938 to Helen Kunze and Thomas O. Bjorklund, the family moved to Phoenix, AZ where he spent his childhood. “Tommy” had fond memories of visits to his mother’s family home and his many cousins in Nebraska.

Tom’s math and science skills caught the attention of a Caltech admissions counselor who encouraged him to enroll. Tom was energized by the challenging academics at Caltech, and played football as tackle and blocking back. In later years, Tom liked to brag that he played in the “Rose Bowl”, which is true because the Rose Bowl was Caltech Football’s home field.

With a Bachelor’s of Science in Geology from Caltech and then a Masters degree from the University of Texas in Austin, he was hired by Chevron in Denver, CO to work in oil and gas exploration. In Denver, Tom met and fell in love with Meredith Schlater, a recent graduate from Northwestern, and they married in 1965. His career took them to the oil fields of Vernal, Utah, and then to Los Angeles. They started a family in Ventura with first a daughter, Kristin, then a son, Eric. They lived the quintessential Southern California lifestyle, visiting the beach, bowling, and playing cards with friends, until earthquakes and a job change sent them packing to New Orleans, LA, and shortly thereafter, Houston, TX. Tom passed along his love of sports to his kids, who he kept busy with swimming, baseball, and softball.

In 1978, a new job with Amoco Production Company took the Bjorklunds back to Denver. They all enjoyed the many outdoor activities that Colorado offered. Kris and Eric cherish the times with their father-skiing, fishing, camping, and going on long hikes in the Rocky Mountains. Once the nest was empty, Tom seized an opportunity to transfer to Amoco’s international division. He and Meredith started a new life as ex-pats in Trinidad & Tobago, where they had the unique experience of being evacuated by helicopter to an offshore oil barge during an attempted political coup. Tom’s work soon called him away to Pakistan and China, but Meredith had developed a newfound love for the Trinidad lifestyle. After an amicable divorce, Meredith and Tom went on to pursue their own goals.

Tom’s international lifestyle introduced him to the “Hash House Harriers,” a social running club. He became a diehard member with the nickname “Bleeder.” After he returned to the States, he retired in 1994, and his love for academics called him back to school to earn a PhD from the University of Houston. Tom always looked forward to the Caltech reunion every year, but in 1995, it was particularly memorable because he also met Rosaria Bulgarella (Rosanne) who would become his partner for the rest of his life.

After earning his PhD in 2002, he took a position advising graduate students at the University of Houston, while also working as a consultant to oil exploration companies. Roseanne made sure Tom took time away from his work, and they enjoyed travelling together – from cruises to Alaska and the Mediterranean, visiting grandchildren, a Caltech alumni rafting trip, and visiting her family in Italy. It was during this time that Tom, an only child, found great joy to learn that he had a half-brother, Clayton Chase, deepening his ties to his Nebraska family.

Rosanne, his children and grandchildren had a special place in his heart, but Tom’s north star was always scientific advancement, which nourished his soul and gave him purpose. He continued working and researching well into his 80’s when a neurodegenerative disease diagnosis sent him to Davis, CA, where he could be close to his daughter and her committed caregiving.

He is survived by his partner Rosaria Bulgarella, his children Kris [Sandy] Borowsky and Eric [Jenny McClintock] Bjorklund, and his grandchildren Hayley, Skylar, Alex, Nick, Katie, Imogen, Asher, and Calvin.

Remembrance

MICHELLE LYNN “SHELLIE” CROSSLAND

DECEMBER 1, 1974 — JULY 4, 2025



MICHELLE LYNN CROSSLAND, lovingly known as “Shellie,” passed away on July 4, 2025, at the age of 50. Born on December 1, 1974, Shellie’s radiant spirit and boundless energy made an unforgettable impact on all who knew her. She was a devoted wife, mother, daughter, grandmother, sister, aunt, and friend—her presence filled every room with warmth, love, and laughter.

Shellie made a lasting mark on her community through her work with the West Texas Geological Society, where she was known for her dedication and positive influence. She was more than just a colleague; she was a friend to many and a woman whose kindness and hard work left an indelible legacy.

To her family, Shellie was everything. She was the heart and soul of her loved ones, particularly her husband, Cody Crossland. The couple shared an extraordinary bond, built on love, laughter, and Cody’s unwavering support for Shellie’s every whim. Her devotion to her children—Celeste Helms, Hailey Chavarria, Xavier Ramirez, and Hayden Crossland—and her beloved grandkids, Jackson Cabrera and Toni Guerra, knew no bounds.

Shellie was known by many names—Yaya to her grandbabies, ‘crazy lady’ to her closest friends, and Shellie to all who were lucky enough to know her. She never met a stranger and considered her friends, including Tasha, Joel, Joe, and Stephanie, as family. Her

hobbies reflected her zest for life, whether it was soaking up the sun by the pool, traveling with “the Vegas crew,” indulging in shopping sprees at Bath & Body Works, or simply enjoying precious time with her family and friends.

Shellie will be remembered for her fierce love of family, her infectious laughter, and her ability to light up every room she entered. A woman who lived life to the fullest, she was the loud, crazy, yet lovable lady who could turn any moment into a cherished memory.

Shellie is survived by her mother, Tonya Helms; her children, Celeste Helms, Hailey Chavarria, Xavier Ramirez, and Hayden Crossland; her grandkids, Jackson Cabrera and Toni Guerra; and her niece, Devyn Smith. She is now reunited in heaven with her loving husband, Cody Crossland; her father, Wayne Helms; her sister, Tasha Ramos; her brother-in-law, Joel Ramos; her niece, Kyndall Ramos; her grandmothers, Belvin Redus and Shirley Byrom; and her grandfathers, Wayne Helms Sr and Freddy Byrom.

In lieu of flowers, memorial donations may be made to Ellis Resthaven Funeral Home.

Shellie’s love, laughter, and vibrant spirit will be forever cherished and deeply missed by all who had the privilege of knowing her.

Remembrance

JAMES DEWITT McCULLOUGH, JR.

JULY 26, 1953 — JULY 3, 2025



JIM McCULLOUGH, age 71, passed away on July 3, 2025. He was born July 26, 1953 in Murfreesboro, Tennessee, to James Dewitt McCullough Sr. and Peggy Bohannon McCullough (both deceased). He is Survived by his wife, Nora Schwartzkopf McCullough; daughter, Raleigh Palis, and husband Chris, of Spring, TX; stepson, Leonard (Trey) Svrcek, III of Austin, TX; stepdaughter, Madison Rodon, and husband Matt, of Spring, TX; and granddaughters Sailor Palis of Spring, TX, and Harper Rodon of Spring, TX.

Jim was raised in Chattanooga, Tennessee and received a BA in Geology from UT-Chattanooga. He received a MS in Geology from Memphis State University. Upon that graduation, Jim began a 30+ year career as a Petroleum Geologist in Lafayette, Louisiana and in Houston, Texas, where he lived for over 20 years. He worked for several companies, retiring from ConocoPhillips as Global Chief Geologist. He loved geology

and worldwide travel with his wife, Nora.

Upon retirement, Jim and Nora built a home in the Hill Country of New Braunfels, TX. He became active in that community, becoming a Master Naturalist, and volunteering for Meals on Wheels, Tye Preston Memorial Library, The Gorge Preservation Society and in his Waggener Ranch Neighborhood.

Jim and Nora continued his love of geology by traveling to mineral shows around the country. Jim was an avid fan of the Tennessee Volunteers and enjoyed the friendly rivalry with the other UT (Texas), where Nora was a graduate.

By request, no funeral service will be held, as it was Jim's wish to have his ashes scattered amongst a geological site significant to him by his immediate family

Remembrance

DONALD EDWARD NAPP

DECEMBER/22/1928 — JUNE/13/2025



DONALD EDWARD NAPP of Houston, Texas, passed away peacefully at the age of 96 in his home with Nelda Sue, his wife of 74 years, by his side.

Donald was born December 22, 1928, in Alton, Illinois, but moved to Texas with his parents Edward Frank Napp and Ruby Ann Winters Napp the next year. He grew up in Pasadena, attended Pasadena High School, and graduated from Texas A&M in 1951. After serving in Korea as an Army pilot, he returned to Aggieland to complete a Masters in Geology. As a geologist, Donald worked for Gulf and Sinclair, then retired after 23 years with Tenneco. With his wife Nelda Sue Hardie Napp, he lived and travelled throughout the United States, South America, and Europe.

His favorite toy was his 73 Cessna Skyhawk. He was an active member of the QB Society, the Texas A&M Alumnus Association, the Korean War Veterans, the American Association of Petroleum Geologists, First Degree Mason, and the United Methodist Church. He is survived by his wife, Nelda Sue Hardie, his children Susan Napp Willis, Edward Hardie Napp, and David Alan Napp, their spouses Charles Perry Willis, Jr. and Rose Napp, and longtime friend Pat Nichol, five grandchildren Charles Perry Willis III, Sarah Willis Cady, Zachary Willis, Nicole Napp Bordelon, and Amanda Napp, and nine great-grandchildren.



HGS Membership Application

Houston Geological Society
14811 St Mary's Lane Suite 250 Houston
TX 77079

Phone: (713) 463-9476
Email: office@hgs.org

Active Membership

In order to qualify for Active Membership you must have a degree in geology or an allied geoscience from an accredited college or university or, 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 5 years. Active Members shall be entitled to vote, stand for election, and serve as an officer in the Society. Active Members pay \$40.00 in dues.

Associate Membership

Associate Members do not have a degree in geology or allied geoscience, but are engaged in the application of the earth sciences. Associate Members are not entitled to vote, stand for elections or serve as an officer in the Society. Associate Members pay \$40.00 in dues.

Student Membership

Student membership is for full-time students enrolled in geology or an allied geoscience. Student Members are not entitled to vote, stand for elections or serve as an officer in the Society. Student Member dues are currently waived (free) but applications must be filled out to its entirety. Student applicants must provide University Dean or Advisor Name to be approved for membership.

Membership Benefits

Digital HGS Bulletin

The HGS Bulletin is a high-quality journal digitally published monthly by the HGS (with the exception of July and August). The journal provides feature articles, meeting abstracts, and information about upcoming and past events. As a member of the HGS, you'll receive a digital copy of the journal on the HGS website. Membership also comes with access to the online archives, with records dating back to 1958.

Discount prices for meetings and short courses

Throughout the year, the various committees of the HGS organize lunch/dinner meetings centered around technical topics of interest to the diverse membership of the organization. An average of 6 meetings a month is common for the HGS (with the exception of July and August). Short courses on a variety of topics are also planned throughout the year by the Continuing Education Committee. These meetings and courses are fantastic opportunities to keep up with technology, network, and expand your education beyond your own specialty. Prices for these events fluctuate depending on the venue and type of event; however, with membership in the HGS you ensure you will always have the opportunity to get the lowest registration fee available.

Networking

The HGS is a dynamic organization, with a membership diverse in experience, education, and career specialties. As the largest local geological society, the HGS offers unprecedented opportunities to network and grow within the Gulf Coast geological community.

Please fill out this application in its entirety to expedite the approval process to become an Active/Associate member of Houston Geological Society.

Full Name _____ Type (Choose one): Active
Associate Student
Current Email (for digital Bulletin & email newsletter) _____
Phone _____
Preferred Address for HGS mail _____
This is my home address _____ business address _____
Employer (required) _____ Job Title (required) _____ Will you
volunteer? _____ (Y/N) Committee choice: _____

Annual dues Active & Assoc. for the one year (July 1st-June 30th) **\$40.00** _____

Student **\$0.00** _____

OPTIONAL Scholarship Contributions- Calvert/HGS Foundation-Undergraduate **\$5.00** _____

Total remittance _____

Payment:

Check # _____
Credit card: V MC AE Discover
Credit Card# _____
CVV code (req'd): _____ Expiration: _____ (mm/yy)

Signature: _____ Date: _____

To the Executive Board: I hereby apply for membership in the Houston Geological Society and pledge to abide by its Constitution & Bylaws.

Company(required, mark 'in transition' if unemployed) _____

Company Address _____

City (Work) _____ **State (Work)** _____ **Postal Code (Work)** _____

School (required) _____

Major (required) _____ **Degree (required)** _____

Year Graduated _____

School (optional) _____

Major (optional) _____ **Degree (optional)** _____

Year Graduated _____

Years Work Experience (required) _____

Please submit a brief statement regarding your work experience in the practice or application of earth science or an allied science.

AAPG Member Number _____ **OR**

HGS Sponsor's Name _____

Signature: _____ **Date:** _____

Professional Directory

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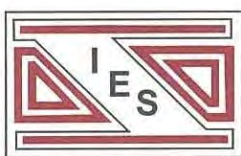


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The photo was taken from the peak of Blackhead Mountain near Pagosa Springs, Colorado. The fall colors have turned, with the golden aspen in the distance. Photo courtesy of Ted Godo