



# HGS Bulletin

Volume 67, Number 5

Houston Geological Society

JANUARY 2025

**Tying the Frio and Catahoula Tuffs and Volcanic Rock Fragments to the World's Largest Volcanic Eruption, La Garita Caldera Colorado**

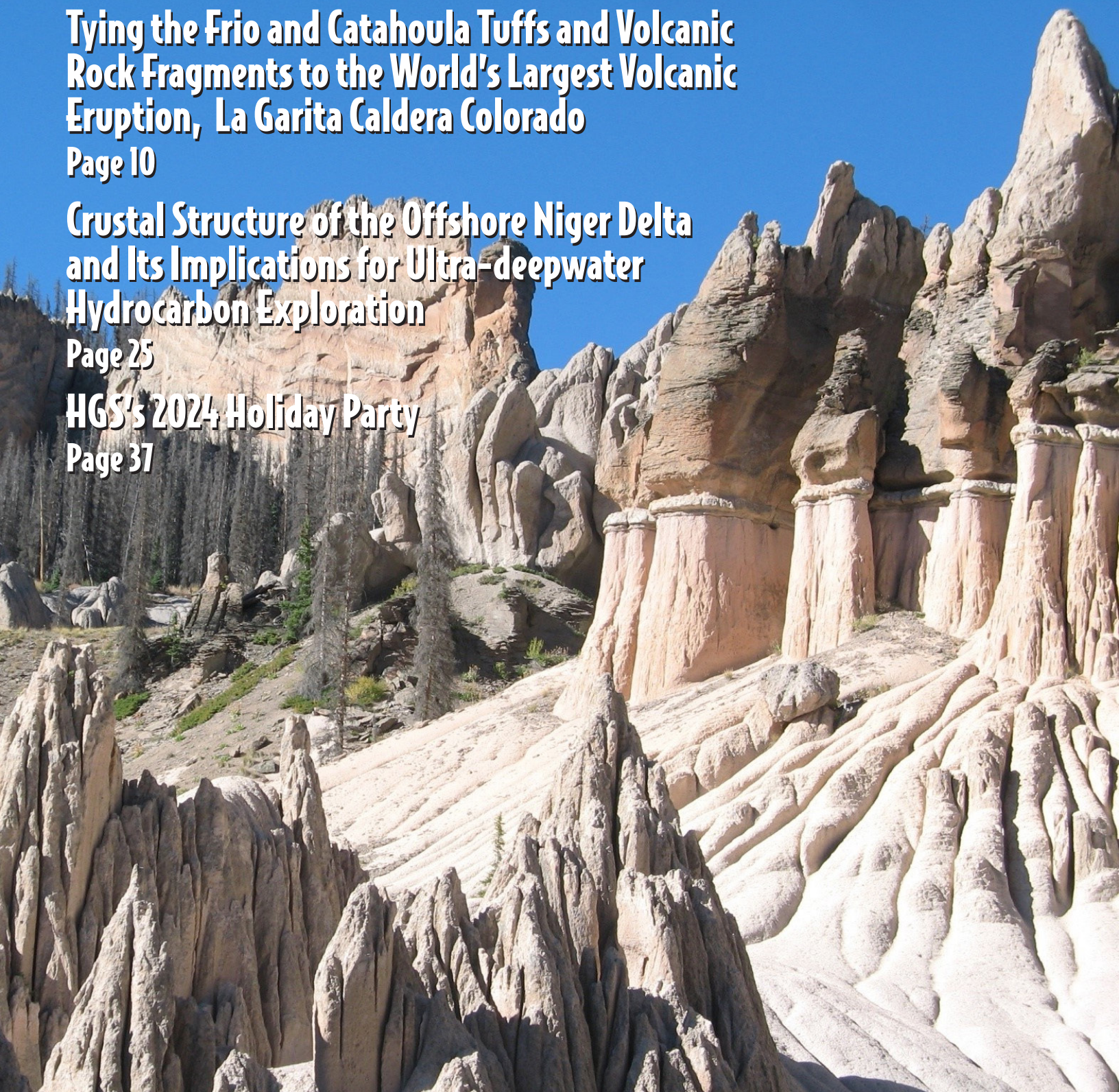
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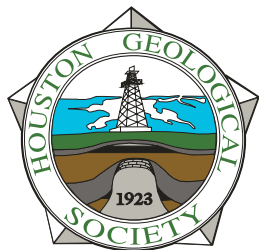
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# The Bulletin

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Volume 67, Number 5

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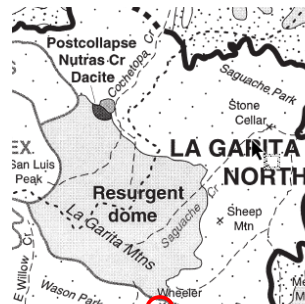
**About the Cover:** The photograph is taken in the "Wheeler Geologic Area" near Creede, Colorado. The layers of volcanic tuff in the photo were deposited within the giant Oligocene-aged La Garita caldera. Photo courtesy of Steve Earle.

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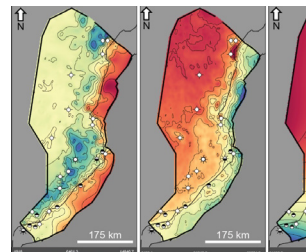
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*HGS-sponsored events for 2024 include HGS/GESGB Africa Conference, GSH/HGS Case Studies Symposium, HGS Clay Shoot Tournament, HGS General Dinner Meetings, HGS Golf Tournament, HGS NeoGeos Meetings, HGS Scholarship Night, HGS Shrimp Peel, HGS Student Expo, and HGS Continuing Education*





Penny Patterson, HGS President 2024-25  
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## A Time to Look Back and A Time to Look Forward

January is a time to reflect on and look back on the many events of 2024 and ponder some New Year's resolutions for 2025.

Looking back on 2024, HGS has had an excellent year with numerous successful technical meetings and social events. Reviewing HGS's 2024 calendar reveals that over the year, HGS held 23 Dinner and Luncheon technical meetings, 16 social events, 5 Continuing Education Courses, 5 Educational Outreach Programs for our budding geoscientists, 2 conferences, and 1 collaborative HGS-GSH symposium. These events provided integral platforms for exchanging new and evolving technologies, various networking opportunities, and, of course, many occasions to see friends and develop new friendships within our geoscience community. All these HGS events could not have been possible without the help of HGS members, volunteers, and staff, as well as financial contributions to HGS. I sincerely thank everyone for their support of HGS over this past year. I extend a sincere thanks to the HGS Board Members who have helped HGS move forward on its mission statement and its financial goals. I also give a special thank you to Andrea Peoples, HGS's Office Manager, who has provided critical assistance in organizing and hosting these HGS events. In addition, HGS is extremely thankful for the contribution to HGS that has helped support HGS's numerous meetings and events. We would like to recognize all sponsors and donors for their contribution in 2024 by highlighting them on our HGS Sponsorship page.

Looking forward to 2025 and pondering New Year's resolutions, my thoughts came from a brief talk I gave in September at HGS's Student Expo. The title of my talk was "Engage, Explore, and Excel." This talk was intended to provide three guiding principles to help students during their job interviews with company representatives at the Student Expo and continue guiding them as they move along their career paths.

This talk's three guiding principles or themes may apply to 2025 New Year's Resolutions to "Engage, Explore, and Excel." The first theme of "Engage" is to encourage everyone to engage in

discussions with people that you meet along your career path, whether it is during your first job interview or during the course of your career as you attend geoscience conventions or social gatherings. This brings me to a memorable event that occurred early in my career. A few friends invited me to join them at a multi-company holiday party. I had just moved to Houston, so I was hesitant to join them, but I did. When I walked through the

event's door, I saw hundreds of people and did not know anyone! My friends quickly disappeared into the crowd, and I was left alone! Well, I thought: "No guts – no glory." I walked up to a small group of total strangers and introduced myself, and I was soon included in the conversation.

I continued to meet new people throughout the evening and was astounded by how much I learned from the various conversations and how gracious and inclusive everyone was. So, this New Year's resolution is: Do not be a wallflower and let opportunities pass by you. Boldly, attend meetings and social gatherings and engage in meeting new-found acquaintances. HGS has numerous opportunities to engage with fellow geoscientists and grow your friendships.

The second theme, "Explore," is to encourage everyone to use their time exploring new ideas, new concepts, new areas of research, etc. Whenever you gather in meetings or social events, use this opportunity to be curious, ask questions, and continue to research new fields of disciplines, ideas, technologies, and concepts bashing existing paradigms. The field of geoscience is continuously growing and advancing with new insights that we are obtaining from various directions, such as the development and expansion of CCUS projects and new technologies, such as AI's machine learning tools, that can be utilized in numerous geoscience projects. So, this New Year, resolve to "Be curious" and explore areas outside your daily work. HGS has numerous opportunities to engage with fellow geoscientists and grow your knowledge.

The third theme, "Excel," is to encourage everyone to do well at their work and their home life. If you enjoy your work and your

From the President continued on page 7





Ted Godo, HGS editor 2024-25  
editor@hgs.org

## Mid-Term Thoughts and Review

Writing this editorial in mid-December is an appropriate time to reflect on the past year. Five *Bulletins* are in the books. I now look forward to the last five issues of my term as your editor and how I might improve them. Reviewing my goals – a first priority (and the most challenging) is finding technical articles and writing “feature articles”. To help provide this, I need your help and encourage all to submit technical articles. Ideally, the articles would provide awareness and help people learn about different facets of geoscience’s ongoing and developing subjects. The current January issue features six abstracts on technical topics from the Sheriff lecture night held last month on November 11. We appreciate Dr Paul Mann, the CBTH director, for getting the abstracts to us in time for publication this month. In terms of the number of technical articles, last month’s *Bulletin* was a banner edition with a fabulous collection of papers highlighted from December’s Africa conference.

“Feature Articles” in each *Bulletin* can have different emphasis or on hopefully interesting subjects. During my term as your editor, the monthly “feature articles” attempt to present, in some cases, subjects in which I have fair competence. Still, in other “features”, I present a more journalistic review of others’ work that summarizes their thinking. Both methods aim to spur interest, thinking, and questioning by our readers. During my term, the *Bulletin* has tried to offer a broad scope of fields that lead us into the energy transition as well as articles such as “fun” rockhounding features. For the energy transition, examples would be the Lithium article in the September *Bulletin* and the Hydrogen article in the October issue. However, we cannot lose sight of the need to maintain the traditional oil and gas opportunities for the resources needed

*it’s especially important  
for the younger generation  
of geoscientists to know  
about the non-traditional  
areas with exploration  
potential*

today. I believe it’s especially important for the younger generation of geoscientists to know about the non-traditional areas with exploration potential (such as the November article on Cuba’s Exploration potential). Questions are also posed to our readers, such as in the November issue, where the discussion focused on the viability of a new play for an Upper Jurassic oolite play in the EGOM. Sometimes, there can be blind spots by individuals or management who might tend to follow other exploration leaders rather than thinking about forging a new path or ideas. Hence, reviewing areas not always “in the news” can hopefully provide more geological and historical context. However, I often need some help or input from experts to ensure I provide more up-to-date content in writing “feature articles”. They have a deep knowledge of various subjects and help me understand the subject material better. To them, I offer a sincere “thank you”. The list of people that have provided ideas and clarifications for me include Doctors Julie Bloxson (SFA), Robert Erlich (Cayo Resources), Katherine Knierim (USGS), Joe Landy (PSI), Brian LeCompte (MOC), Paul Mann (UH), Ian Norton (UT), James Pindell (Tectonic Analysis LTD), John Snedden (UT), and Rafael Tenreyro (CUPET). As a disclaimer, all the opinions in the “Feature Articles” are my own and do not necessarily reflect those of the people I just mentioned, but again, I am most grateful.

If anyone would like to offer suggestions for subjects in the “feature article,” please email me, and I will try to incorporate them into the *Bulletin*. I hope this “Half-time” talk provides effective encouragement to make this new year even better. I wish you all a successful and joyous 2025 New Year. ■

### WELCOME TO NEW MEMBERS, EFFECTIVE DECEMBER 2024

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home activities, then the products of your hard work will be self-evident to your employer, clients, family, and friends. Working on a project and putting your best effort into every aspect of your work is extremely rewarding. If, however, things are not as much fun as you would like, then you might want to reflect on the situation at hand, i.e., is there something that you can do to change the course, or is there something that piques your interest more than your current position? So, this New Year's resolution is: Excel in everything you do at work and home. HGS has numerous opportunities to engage with fellow geoscientists and grow your excellence.

In summary, HGS has many opportunities to "Engage, Explore, and Excel." Be sure to use every moment available to you to get involved, grow in friendships, knowledge, and excellence, and, in turn, contribute to our geoscience community.

I will close with a quote from Edward Everett Hale: "Coming together is a beginning; keeping together is progress; working together is a success." Let's come together and make HGS a success! ■

*Best wishes to all in 2025!*

*I look forward to seeing you at HGS's events in 2025!*



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

TLACAUHAO ○ ○ \_ \_ \_ \_ \_ ○ ○

AL TGARAI \_ \_ \_ \_ \_

TADE ○ \_ \_ \_

PROUEITN ○ \_ \_ \_ \_ \_

OSCRK ○ \_ \_ \_ \_

SAH ○ \_ \_

HINT: A large depression forms when a volcano erupts and collapses

\_ \_ \_ \_ \_

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# We Are The HGS



**YUEH-PING KU**, HGS member since November 2024

Born and raised in a small city on the island of Taiwan, Yueh-Ping was surrounded by natural beauty from an early age. As a young student, she was drawn to adventure and exploration, participating in a pioneer summer camp she “climbed muddy ground” and gazed at the Milky Way from a scientific vessel in the Pacific Ocean left a lasting impression. “I feel the world is beautiful and amazing,” Yueh-Ping recalls, a sentiment that would later inspire a career in geoscience.

*Yueh-Ping’s decision to join the HGS stemmed from a desire to connect with like-minded professionals*

Yueh-Ping pursued a career in geology to better understand the environment and contribute to society. This passion led to groundbreaking postdoctoral research at National Chiao Tung University, where she explored volcanic activity and the environmental impact of both natural and industrial chimneys. The research focused on improving industrial practices, including the design of equipment to capture harmful gases and real-time detection methods. “The most important thing I learned at the institute was testing theoretical formulas and experimenting with different materials and designs,” Yueh-Ping reflects.

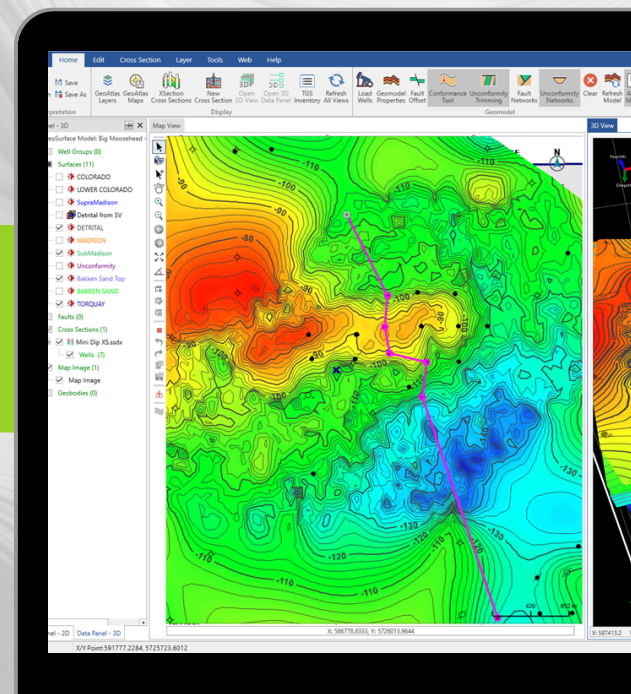
Yueh-Ping’s journey also included notable experiences in Australia, where she worked on a couple of shallow-water oil production projects, learning firsthand about the intersection of engineering, subsurface exploration, and environmental protection. She believes that “The art of engineering connects the subsurface, the ground level, and the community life, always prioritizing safety and sustainability”. Today, in Houston, Yueh-Ping enjoys the dynamic exchange of ideas in the energy capital of the world. Outside of work, she enjoys birdwatching, appreciating historic architecture, and sampling local cuisine. Her decision to join the HGS stemmed from a desire to connect with like-minded professionals, noting, “I feel like I’m among old friends, exploring the environment and listening to each other’s stories.” ■

*We Are The HGS is a series that highlights the careers and contributions of HGS members with the intention of building community. Would you like to be featured in We Are The HGS? Send a note to [editor@hgs.org](mailto:editor@hgs.org).*

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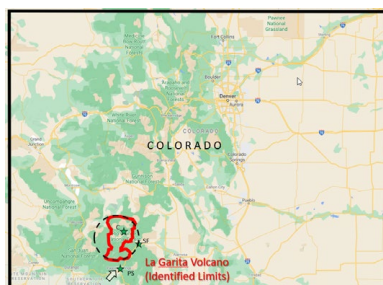
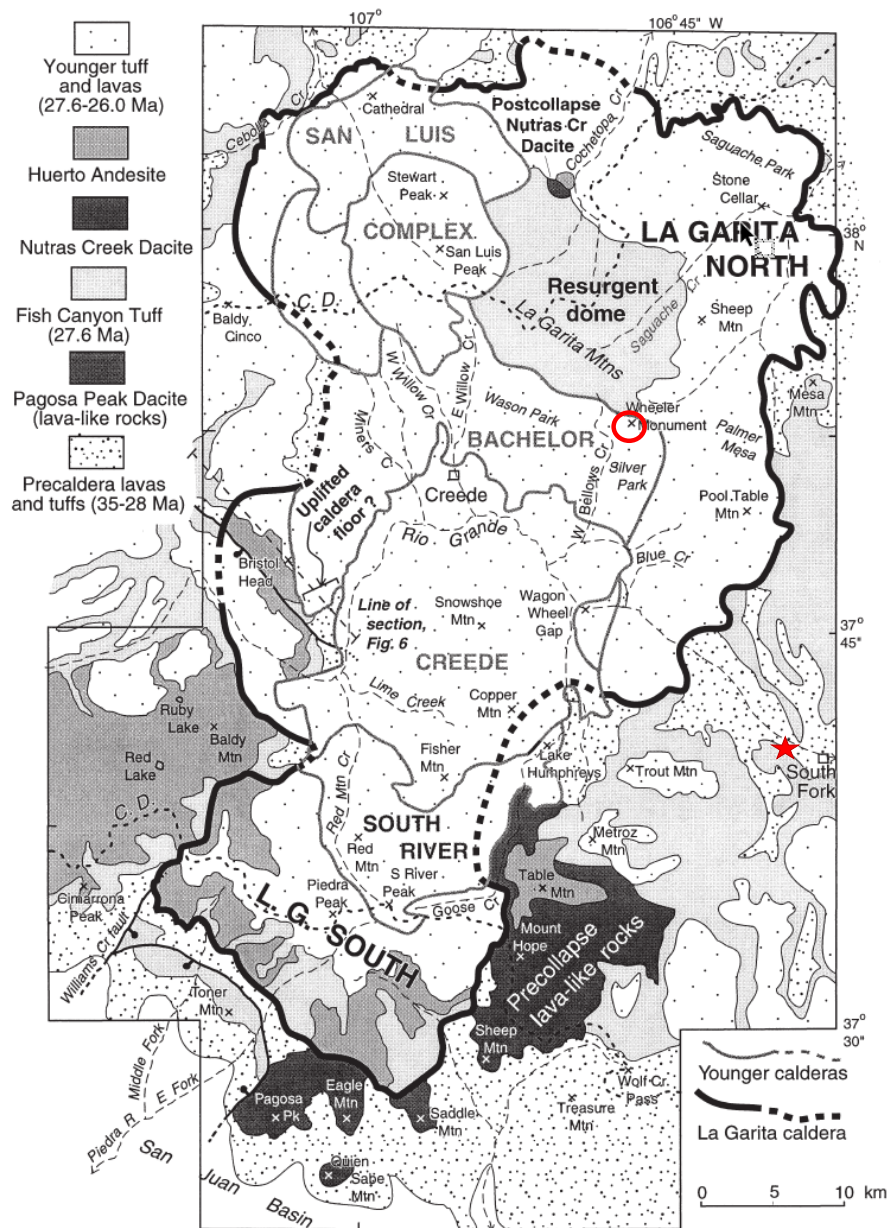


# Tying the Frio and Catahoula Tuffs and Volcanic Rock Fragments to the World's Largest Volcanic Eruption, La Garita Caldera Colorado

By Ted Godo

Have you heard of the Wheeler Geologic Area (WGA) in southeast Colorado? The WGA is a magnificent exposure of volcanic tuffs eroded into the most unusual landscape forms often referred to by artists as the City of Gnomes, White-Shrouded Ghosts, or Dante's Lost Souls. Geologically, the descriptions would be domes, capstones, needles, spires, caves, pinnacles, and balanced rock. The exposed tuffs are somewhat monochromatic, generally around a light-gray color. President Teddy Roosevelt named the WGA Colorado's first national park in 1908. President Roosevelt established 23 national parks and monuments during his administration. The WGA is remotely located, and people who came to the national park had to take a grueling wagon ride to the exposure area. In 1933, amid the Depression, no funds were available to develop a more inviting trail, so it was decommissioned. Today, WGA is still remote, and there are two ways to get there from the highway pull-off. The first is a seven-mile hike, and the other is a 14-mile (3-hour one-way ride) using an ATV. The "park" was named for George M. Wheeler, a U.S. Army Corps of Engineers surveyor from 1872 to 1879.

The volcanic tuff exposures in this area were deposited within the La Garita Caldera (Figure 1). Identifying and mapping the La Garita caldera took over 30 years (1965-1997) to carefully uncover all the post-Oligocene soil cover, landslides, and stream erosion filled with recent sediments (Lipman, 2000). The La Garita caldera was created by the world's largest known volcanic eruption, dated 28.2 Ma during the Oligocene. This volcanic eruption would have occurred



**Figure 1.** The map of the La Garita caldera and surrounding area (Lipman, 2000). The red circle is the Wheeler Geologic Area, with younger tuffs deposited within the walls of the La Garita caldera.

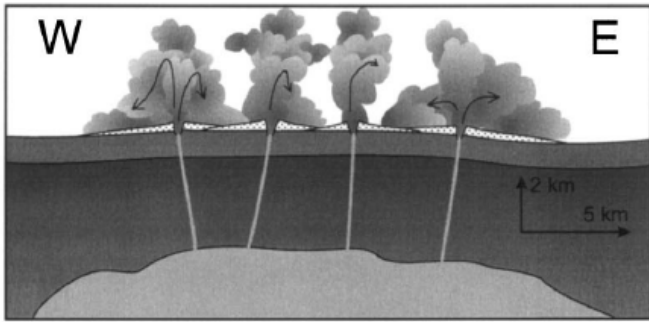
The red star is the location of the photo in Figure 4 of the Fish Canyon Tuff, resulting from the main explosions of La Garita.

Tying the Frio and Catahoula Tuffs

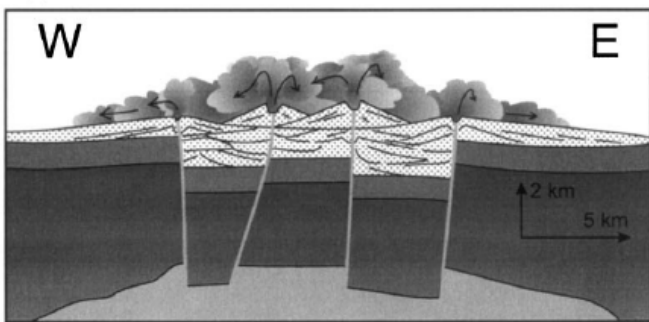
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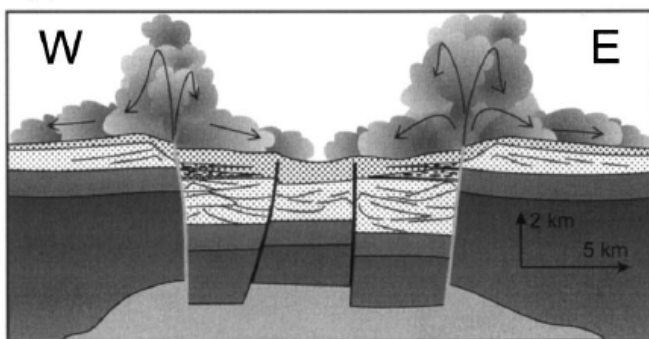
during the Catahoula formation in south Texas (more later). La Garita was a supervolcano. Volcanoes of this size do not build mountains, but rather, they destroy mountains that, after an eruption, collapse into a vast crater (**Figure 2**). At the beginning of the eruption, the magma chamber comes close to the surface. As the magma chamber is depleted through multiple explosions of blasting away the cover, the remaining debris settles back down



(b)



(c)



**Figure 2.** (figure 12 of Bachmann et al. 2000)- Schematic processes during the eruption of the Pagosa Peak Dacite and Fish Canyon Tuff:

(a) early eruption of Pagosa Peak Dacite — emplacement of lithic-bearing deposits from multiple vents;

(b) main stage of this eruption—low-column pyroclastic fountaining from fissure vents along syneruptive faults;

(c) eruption of the Fish Canyon Tuff and collapse of the La Garita caldera, triggered by magma chamber depressurization induced by the Pagosa Peak Dacite eruption. More explosive eruptive style results from catastrophic magma escape along ring-fault vents.

into what is formed, which is a large hole. The La Garita crater has been mapped as 22 miles wide by 47 miles long (35km by 75km). The main deposit resulting from the caldera explosion that sent ash into the air is the Fish Canyon Tuff (**Figure 3**). The thickness of this tuff is over 1km thick at La Garita Mountain, and the base is not exposed. After the caldera collapsed following the Fish Canyon explosion, seven additional eruptions occurred within the caldera. These eruptions continued for more than three m.y. after the massive eruption of the Fish Canyon Tuff, recording a total span, together with the caldera volcanism, of approximately 10 m.y. of eruptions from 35 to 25 Ma (Lipman, 2024). **Figure 4** of the WGA shows the names of several tuffs deposited within the caldera after the massive Fish Canyon tuff.

The major explosion episode of the La Garita caldera 28.2 Ma ago was massive. La Garita ranks at the top of all global explosions by using the Volcanic Explosivity Scale (VEI), created to depict any eruption's explosiveness. The scale uses things like eruption height



**Figure 3.** Fish Canyon Tuff (upper columnar cliff-forming unit) overlies compound welding zones in Masonic Park Tuff, along Rio Grande near Masonic Park (South Fork West quad).

and the quantity of material erupted as measurement tools. No one was around in the Oligocene to measure the explosive height, but we can look at the volume of erupted material associated with the La Garita explosion. The VEI scale ranges from 0 to 8 as the most explosive event (exponentially increasing with each level) (**Figure 5**). The scale was devised in 1982 by C.G. Newhall and S. Self of the USGS (Newhall and Self, 1982). Some have suggested that the scale should be expanded to a 9 for the La Garita explosion based on the tremendous volume of volcanic material expelled (**Figure 6**). The La Garita caldera is part of the Southern Rocky Mountain volcanic field (SRMVF), specifically located within the San Juan Volcanic Field (SJVF) (**Figure 7**).

Within the San Juan locus, where the most concentrated and explosive calderas are, new  $^{40}\text{Ar}/^{39}\text{Ar}$  and U-Pb zircon ages

**Tying the Frio and Catahoula Tuffs** continued on page 12

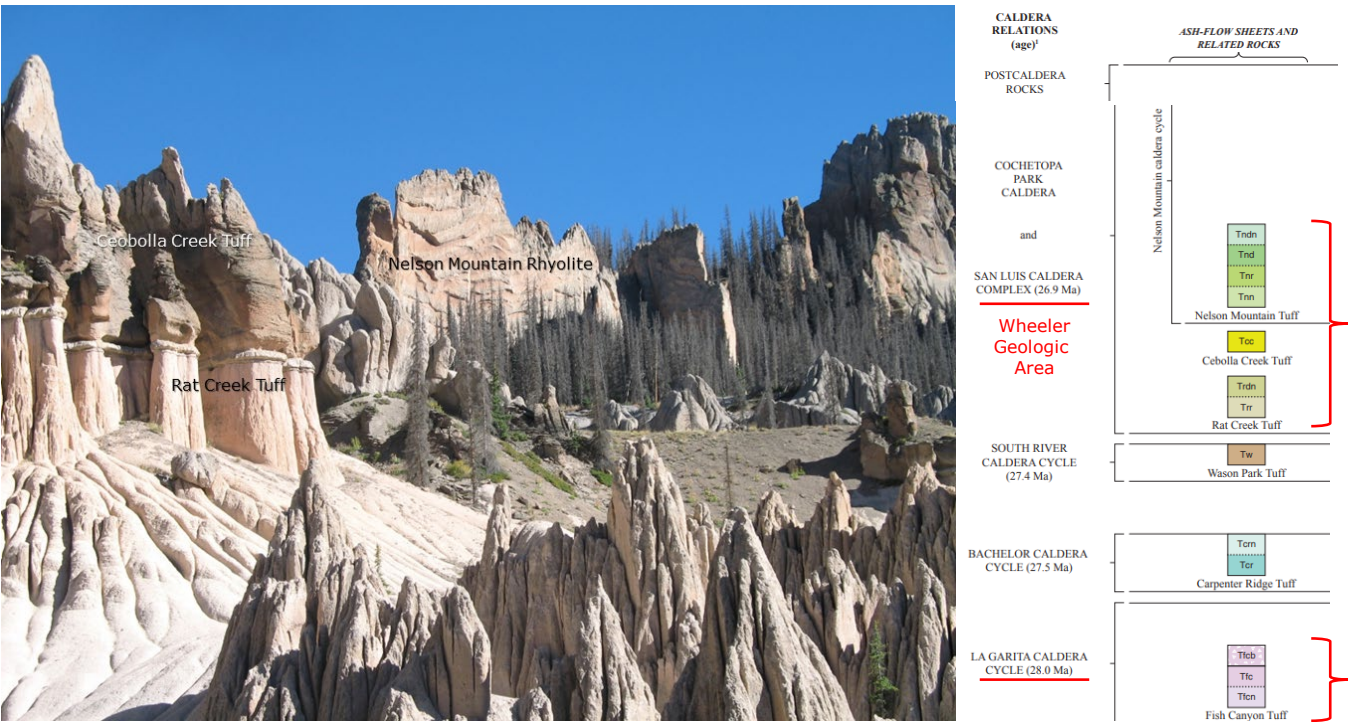


Figure 4. Wheeler Geologic area with names of the tuff formation and a sequence chart of eruptions in La Garita by Lipman, 2012

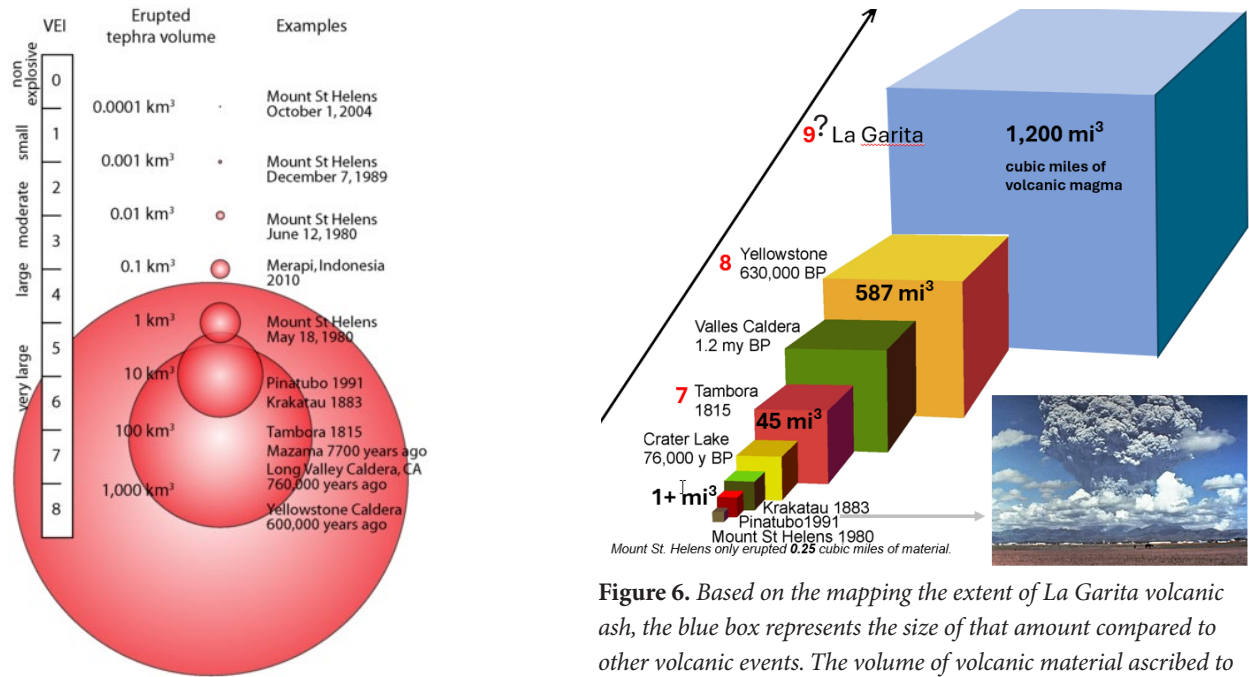
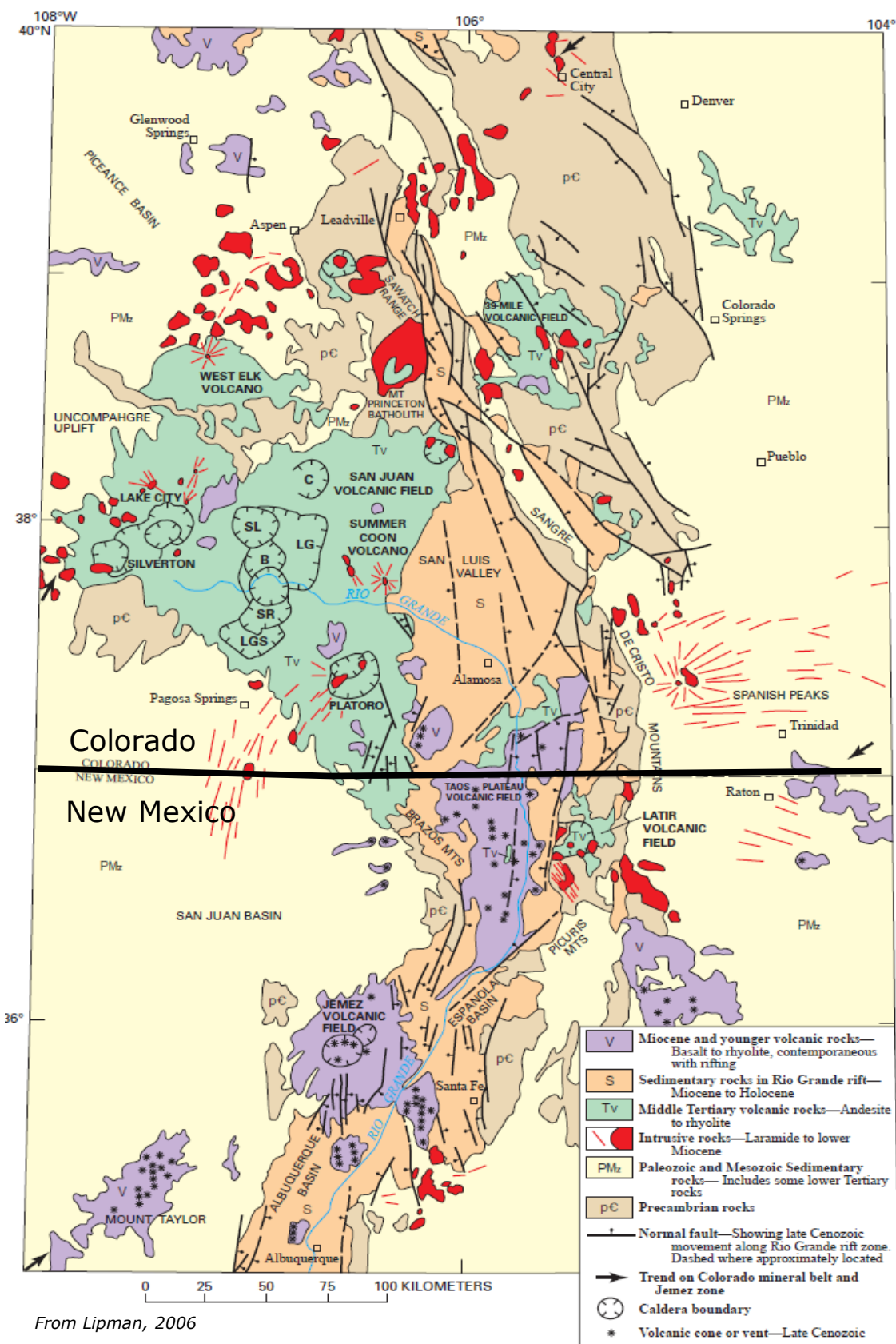


Figure 5. The volume of products, eruption cloud height, and qualitative observations. The scale is open-ended, with the largest volcanic eruptions in history given a magnitude of 8. A value of 0 is given for non-explosive eruptions, defined as less than 10,000 m<sup>3</sup> (350,000 cu ft) of tephra ejected. An 8 represents a mega-colossal explosive eruption that can eject up to 1012 m<sup>3</sup> (240 cubic miles) of tephra and has a cloud column height of over 25 km (15 mi). The scale is logarithmic, with each interval representing a tenfold increase in observed ejecta criteria, except for between VEI 0, VEI 1, and VEI 2.

Figure 6. Based on the mapping the extent of La Garita volcanic ash, the blue box represents the size of that amount compared to other volcanic events. The volume of volcanic material ascribed to La Garita is a minimum given how much is currently exposed and mappable as well as identifiable ash deposited across the North American continent.

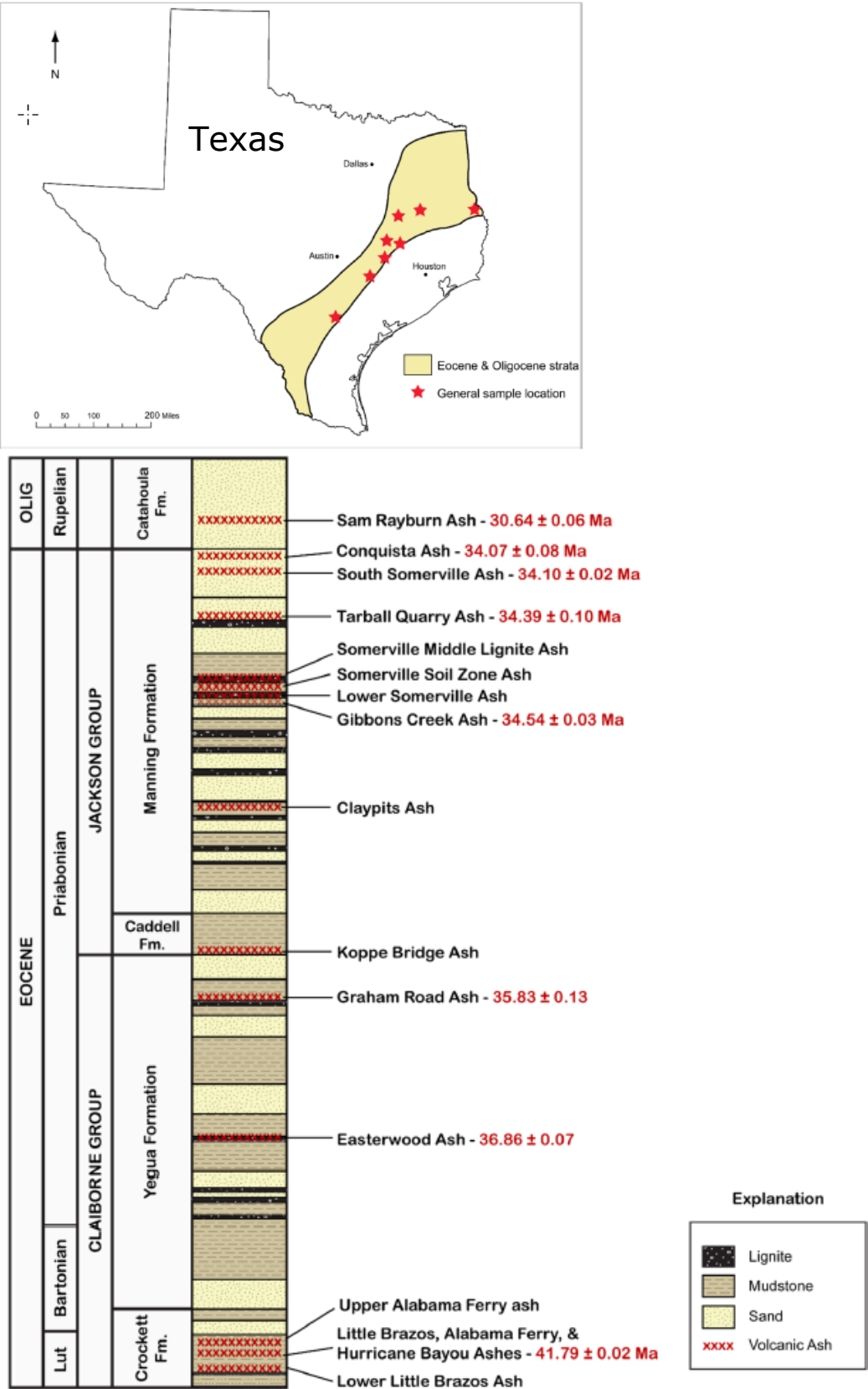




**Figure 7.** Map of the Southern Rocky Mountain Volcanic Field (green), which includes other Miocene igneous centers (purple), Precambrian uplifts (tan), and late Cenozoic extensional faults with the sedimentary basins of the Rio Grande rift (orange).

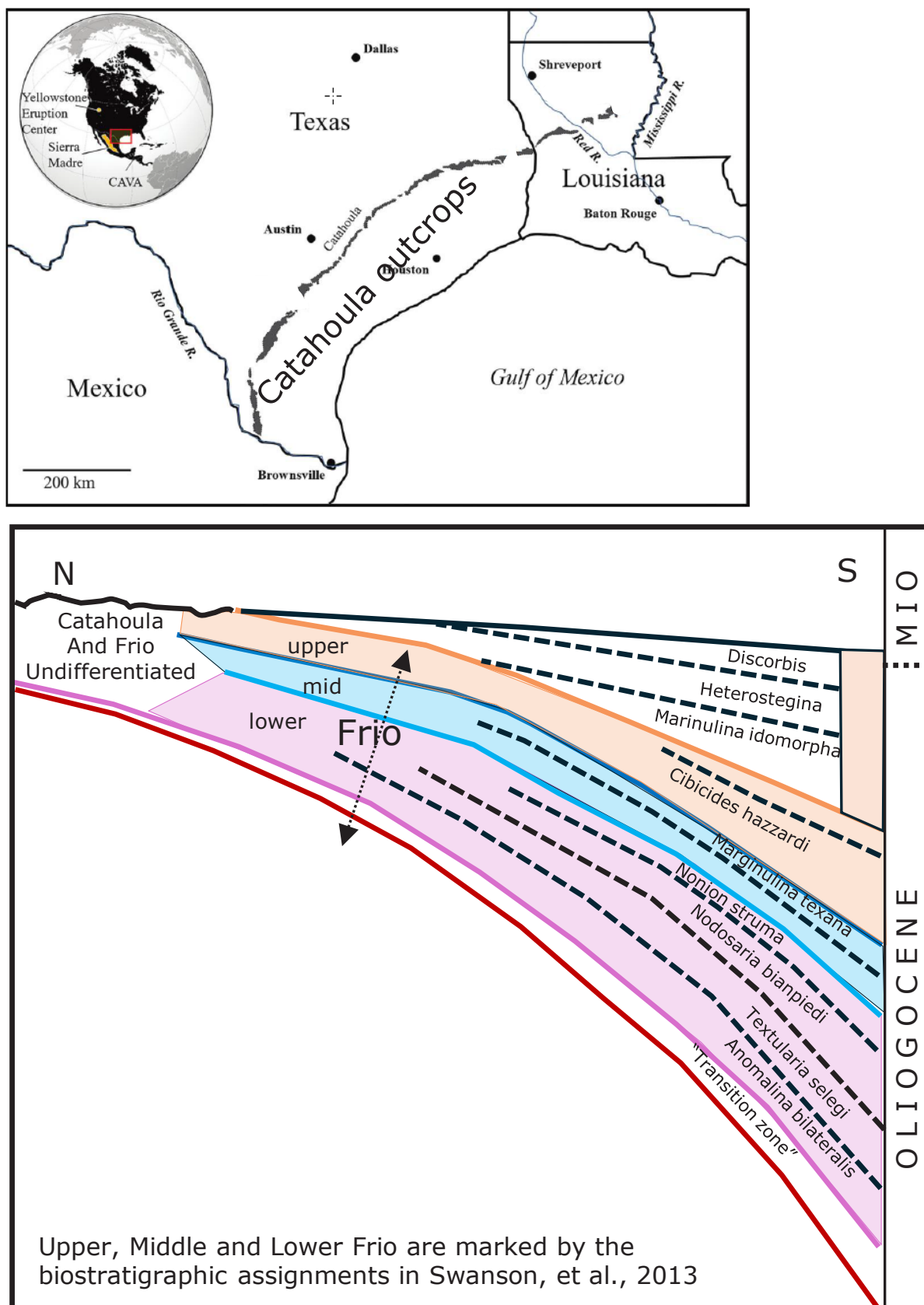
Caldera abbreviations: B, Bachelor; C, Cochetopa; LG, La Garita; LGS, La Garita South; SL, San Luis Complex; SR, South River.

Tying the Frio and Catahoula Tuffs *continued on page 14*



**Figure 8.** In the upper figure is the location of 15 volcanic ashes within the Eocene Claiborne and Jackson Groups and in the Oligocene Catahoula Formation. The lower figure shows a representative column and position of the entire sampled section annotated with the ash beds and associated dates (Heintz, 2013 fig 1 and 2).





**Figure 9.** The upper map is taken from Jordon, 2019. It shows the outcropping belt of the largely non-marine Catahoula formation comprised of several volcanic tuff layers. The lower figure was constructed using the updip Catahoula to downdip Frio correlations by Galloway (1982, 1991) and Swanson (2013). The biostratigraphic names of the microfossils and their ages are by Swanson (2013)

Tying the Frio and Catahoula Tuffs *continued on page 16*

show that eruptions at many individual edifices began nearly concurrently. Beginning at around 35 Ma, the peak activity occurred between 34–32 Ma, just prior to the enormous explosion of La Garita at 28.2 Ma. The final eruption in the SJVF occurred at 25 Ma. (Lipman, 2024). Swanson and McDowell (1984) compared the number of calderas in the San Juan Volcanic field to the Sierra Madre Occidental of western Mexico. They found 12 calderas over the large area of the Occidental and that 350 calderas would be necessary to produce an equally dense area of calderas like the San Juan volcanic field (Swanson & McDowell, 1984). In the Mexico Sierra Madre Oriental highland, east of the Occidental, primarily thrust belts create the highland, and I could not find any calderas to report.

Obviously, a fluvial drainage system would deliver volcanic rock fragments. However, air-fall tuffs have an unrestricted dispersal and suggest that a more specific source could be tied to specific caldron explosion dates when compared to dates derived from the tuff beds. Heintz (2013) shows a stratigraphic column of the Eocene to Oligocene outcrops in Texas with ashes in each formation with associated age dates (**Figure 8**). The ash age dates span from 41 to 30 Ma, and as pointed out earlier, the San Juan Volcanic Field also had major eruptions between 25 and 35 Ma (Lipman, 2024). Obradovich (1993) and Grigby (1999) suggested that many of the ash beds that are found in this same stratigraphic section, as described by Heintz (2013), may be correlatable throughout the Gulf Coast.

The Catahoula Formation has a broadly extensive outcrop and is largely nonmarine. Jordan (2019) shows the outcrop belt through Texas and Louisiana (**Figure 9** upper). The Catahoula Formation is an up-dip, non-marine unit with equivalent downdip marine units in the Frio Formation (Galloway, 1982, 1991; Swanson, 2013). Based on the Biostratigraphy chart of the Gulf of Mexico, the foraminiferal planktic and benthic regional markers indicate that the Upper Oligocene ranges from 23.9Ma to 28.50Ma and the Lower Oligocene ranges from 28.50Ma to 33.70Ma. (Swanson 2013). The entire Oligocene would be correlative in time with the major caldera explosions in the San Juan Volcanic Field of SW Colorado (35Ma to 25Ma) Lipman 2024. With these age dates, the La Garita volcanic explosion would be essentially at the boundary of the Lower and Upper Oligocene. Relating the biostratigraphy index fossils to formations, the entire SJVF eruptions would be during both the Frio and Catahoula formations (**Figure 9** lower).

A final example of volcanic tuff likely sourced from the La Garita caldera explosion may be found in western Nebraska. Scott's Bluff is the name of this erosion remnant "tower," which is also a national park. The Bluff towers some 800 feet above the North Platte River and has served as a landmark for peoples from Native America to emigrants on the Oregon, California, and Mormon Trails. Loop (2005) measured a section on the part of the bluff

and sampled a thick (25m) volcanic sandstone and tephra (airfall tuff). The tuff is part of the Oligocene Gering Formation and has a date of about 28Ma. Loop (2005) makes a connection with the La Garita explosion as he writes that a "possible source of the tephra were eruptions of about 28 Ma in the San Juan volcanic field of southwestern Colorado (500 km SW of the study site)".

So, there you have it—two potential vacation spots to visit historic and beautiful national parks. Before you go, a bit of geologic background may help you appreciate the turbulent volcanic times that "rocked" the Oligocene. ■

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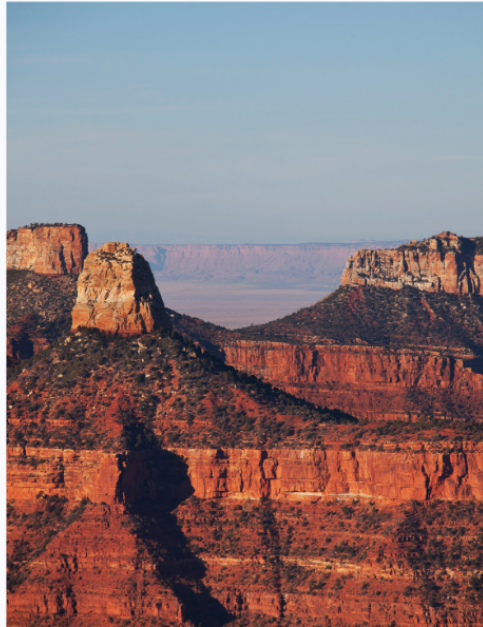
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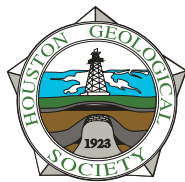
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Henry Pettingill and Rocky Roden

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| 2.  | DHI and AVO Technology                                       | (45 minutes) |
|     | <b>BREAK</b>   | (15 minutes) |
| 3.  | Case Study Introduction: the Glenlivet Prospect              | (15 minutes) |
| 4.  | Seismic and Rock Physics Data Quality                        | (30 Minutes) |
| a.  | Why it is so important                                       |              |
| 5.  | DHI Characteristics: discussion of the most important ones   | (60 minutes) |
|     | <b>LUNCH</b>   | (60 minutes) |
| 6.  | DHI Volumetrics  | (75 minutes) |
| a.  | Introduction, Setting Area Distribution and Net Pay          |              |
| b.  | Glenlivet Example  |              |
| 7.  | Probability of Success (Pg) in DHIs                          | (60 Minutes) |
| a.  | Setting a DHI modified Final Pg                              |              |
| b.  | Glenlivet Example  |              |
| 8.  | Glenlivet Well Results and Learnings                         | (15 minutes) |
|     | <b>BREAK</b>   | (15 minutes) |
| 9.  | SAAM Software and Database: Introduction and Live Demo       | (45 Minutes) |
| 10. | Selected DHI Database Learnings                              | (30 Minutes) |
| 11. | Wrap-up: Summary and Course Evaluation                       | (30 Minutes) |

Continuing Education continued on page 21

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This course draws on lessons from the Rose DHI Interpretation and Risk Analysis Consortium, which offers a unique continual training format for participants, as well as ‘on the job training’ via the flagship activity of our meetings, which is reviewing, evaluating and scoring drilled DHI prospects presented by our members. visit <https://www.roseassoc.com/dhi-consortium>.

### BIOGRAPHICAL SKETCHES



**HENRY S. PETTINGILL, Principal Consultant and DHI Consortium Chairman.** Henry S. Pettingill is a Petroleum Geologist and Exploration Manager who has been in the oil and gas industry since 1983. He joined Rose Subsurface Assessment in 2018 after 16 years with Noble Energy Inc., where he finished his career as Chief Geoscientist. Prior to that, he served as Director of Business Innovation from 2013-2015, and as Director of Exploration Technology from 2002-2013. His responsibilities included overseeing the Global Exploration Portfolio, Risk Analysis, Geoscience Technology, and Staff Development. Prior to joining Noble, he held various technical and managerial positions within Repsol and Shell. His assignments have focused on Deepwater Exploration and Appraisal, International Exploration/New Ventures, Exploration Risk Analysis, and Portfolio Management. Henry has authored over 100 conference presentations and technical papers, and has taught classes in Exploration Risk Analysis, Creativity and Innovation for E&P Organizations, and a Deep Water Clastics field trip in the Spanish Pyrenees. In 2017, he was recognized by AAPG as one of the industry’s “100 Explorationists Who Made a Difference.”

Mr. Pettingill holds a BA degree from the University of Rochester and an MSc degree from Virginia Tech (USA). He is an AAPG Certified Petroleum Geologist and an active member of AAPG,

SEG, and SPE. He is a Trustee Associate of the SEG and AAPG Foundations. Pettingill is chairman of the Rose DHI Consortium. He serves on the Advisory Board of Virginia Tech Department of Geosciences.



**ROCKY RODEN, Rocky Ridge Resources Inc. Consultant.** Rocky has owned his own consulting company, Rocky Ridge Resources, Inc., for the last eighteen years and works with numerous oil companies around the world on interpretation technical issues, prospect generation, risk analysis evaluations, and reserve/resource calculations. He has authored or co-authored over 40 technical publications on various aspects of seismic interpretation, AVO analysis, amplitude risk assessment, and geoscience machine learning. He has over 45 years in the industry as a Geophysicist, Exploration/Development Manager, Director of Applied Technology, and Chief Geophysicist.

He has been a principal in the Rose and Associates DHI Risk Analysis Consortium since 2001. He works with Geophysical Insights on the integration of advanced geophysical technology in machine learning software applications. He is a proven oil finder with extensive knowledge of modern geoscience technical approaches (past Chairman, The Leading Edge Editorial Board). As Chief Geophysicist and Director of Applied Technology for Repsol-YPF (retired 2001), his role comprised advising corporate officers, geoscientists, and managers on interpretation, strategy and technical analysis for exploration and development in offices in U.S., Argentina, Spain, Egypt, Bolivia, Ecuador, Peru, Brazil, Venezuela, Malaysia, and Indonesia.

He has been involved in the technical and economic evaluation of Gulf of Mexico lease sales, farmouts worldwide, and bid rounds in South America, Europe, and the Far East. Previous work experience includes exploration and development at Maxus Energy, Pogo Producing, Decca Survey, and Texaco. He holds a BS in Oceanographic Technology-Geology from Lamar University and a MS in Geological and Geophysical Oceanography from Texas A&M University.

# Abstracts Presented at the Sheriff Lecture

The technical articles for this issue of the *Bulletin* are courtesy of abstracts presented by the research consortium at the University of Houston directed by Dr. Paul Mann. The consortium, “Conjugate Basins, Tectonics, and Hydrocarbons” (CBTH), provides a mega-regional study of the Caribbean, Gulf of Mexico, and Atlantic conjugate margins. The abstracts included here were all shown and judged at the recent Sheriff lecture held last month on November 11 at the University of Houston and co-hosted with the HGS.

Of the six abstracts highlighted here, three won judges awards at the competition that evening:

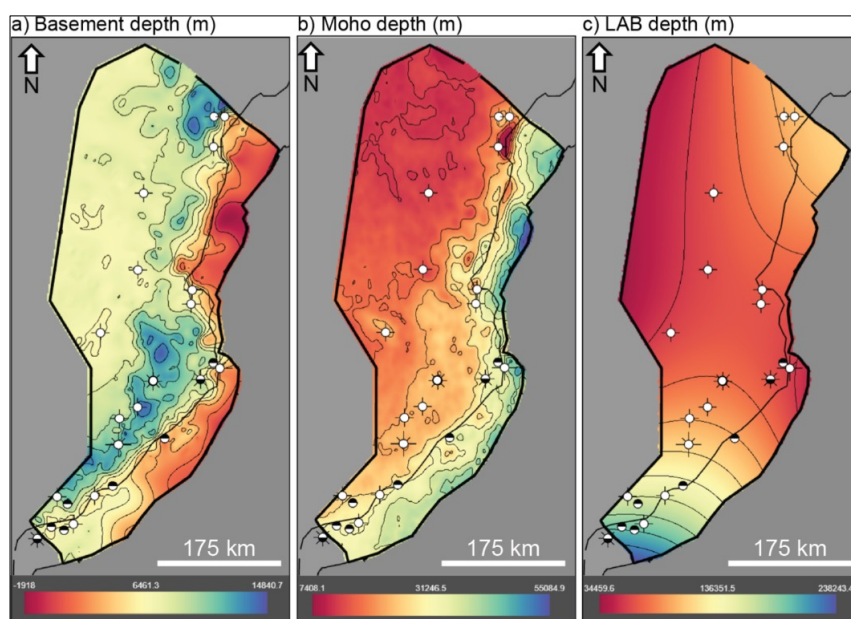
**Estefani Ruiz:** first place in the junior MS/undergrad geology category (Bering Sea)

**Kenneth Shipper:** second place in the advanced PhD geophysics category (Guyana)

**Jumoke Akinpelu:** third place in the advanced PhD geology category (Niger Delta)

## Implications of Lithospheric and Thermal Modeling of the Moroccan Margin on Petroleum Exploration

*Kenneth Shipper, PhD student, CBTH project, Dept of Earth and Atmospheric Sciences, University of Houston  
(kwshippe@cougarnet.uh.edu)*



This study models the source rock maturity of Mesozoic source rocks to map prospective zones of the offshore Atlantic margin of Morocco in northwest Africa. This study integrates public potential field data, public well data, and ~8474 line-km of pre-stack, depth-migrated, 2D seismic reflection profiles over a region of approximately 163,100 km<sup>2</sup>. 2D/3D gravity and seismic interpretation identify a 50-80-km-wide basement depression or marginal rift overlying the rifted continental necking domain parallel to the Atlantic coastline of Morocco. I used seismic interpretation, 2D/3D gravity models, and well data to constrain 1D/3D ExCaliber thermal models to predict and compare expulsion kitchens for Mesozoic source rocks along the ~400 km

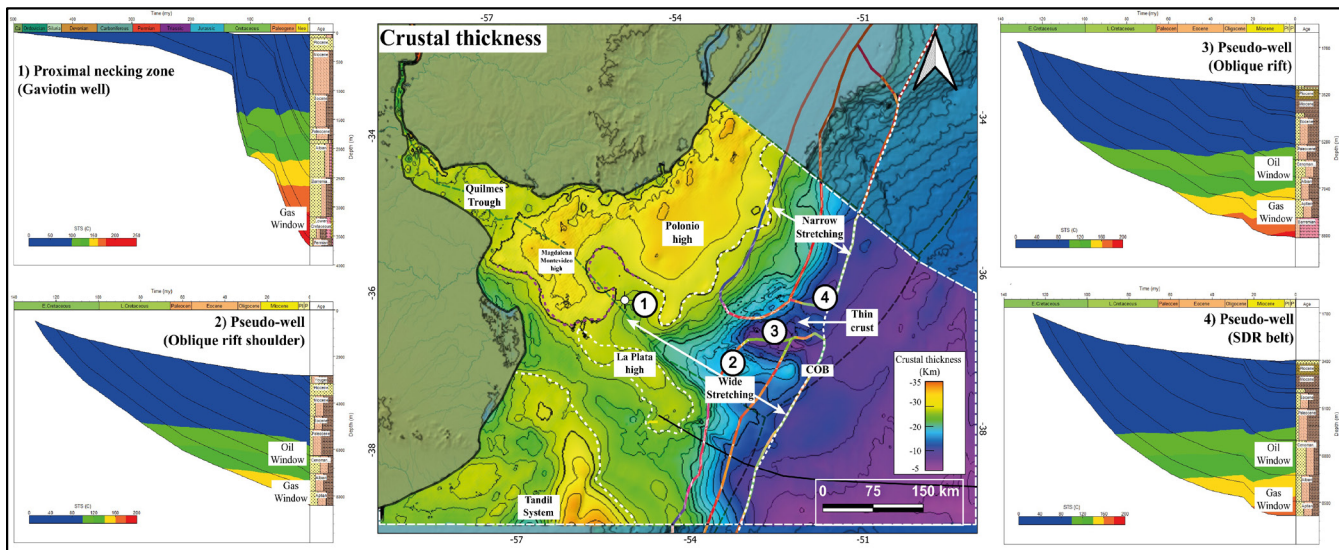
northern segment of the marginal rift with the ~350 km southern segment of the marginal rift with sensitivities addressed using ExCaliber's AI-assisted capabilities. Four source rock acmes are modeled ranging in age from Early Cretaceous to Early Jurassic. Cretaceous source rocks are thermally mature and within the oil window near the Cretaceous Agadir and TanTan deltas. Jurassic source rocks increase thermal maturity to the condensate window along the distal, Atlantic oceanic crust that borders the central and southern margins of Morocco. These deepwater results on oceanic crust are validated by comparing known discoveries and geochemical evidence of an oil migration front previously identified from DSDP well 416. ■

Abstracts Presented at Sheriff Lecture continued on page 23



# Late-stage, Oblique rifting of the Uruguayan volcanic-Rifted Margin and Its Effects on Deepwater Hydrocarbon Maturation

Daniel Maya, PhD student, CBTH project, Dept of Earth and Atmospheric Sciences, University of Houston  
([dmayaort@cougarnet.uh.edu](mailto:dmayaort@cougarnet.uh.edu))



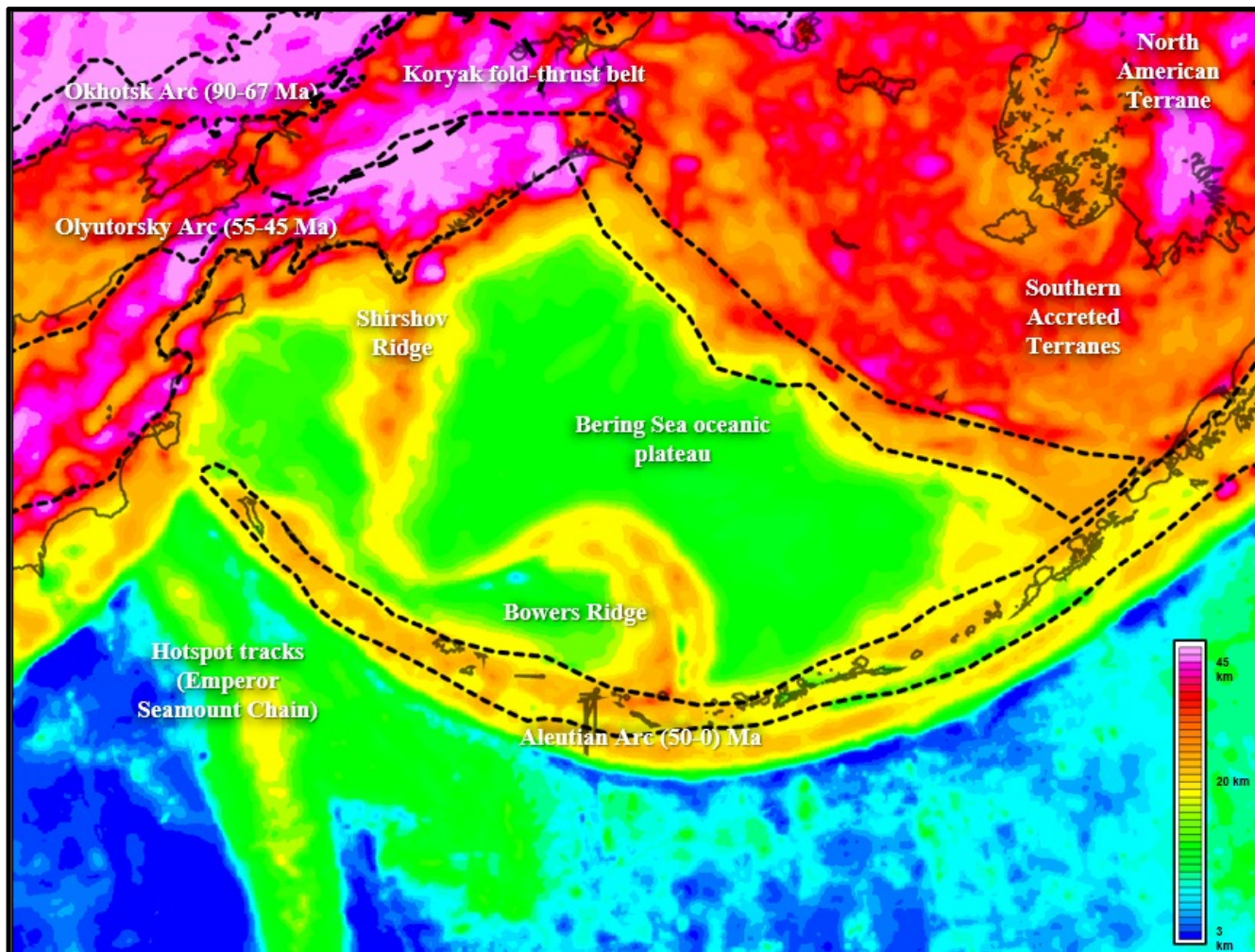
The Early-Cretaceous (135-126 Ma) breakup of the South American and African continents formed a 2200-km-long, deepwater, volcanic-rifted margin along southern Brazil, Uruguay, and Argentina. These margins are characterized by a 3-15-km-thick volcanic section of well-layered seaward-dipping-reflectors (SDRs). I used 11 seismic refraction points and 1477 line-kms of reflection data to constrain the crustal thickness map of the Uruguayan margin. I integrated gravity inversion, 13,306 km<sup>2</sup> of 3D seismic data, 6294 km of 2D seismic lines, and gravity and magnetic data to map a 40-90-km-wide rift that trends obliquely in a north-northwest direction and transects the 120-145-km-wide zone of margin-parallel SDRs. This oblique rift creates an apparent right-lateral offset of 60 km on the SDR belt. Potential fields data show that the SDR belt is continuous to the northeast and southwest of the study area, while the crustal thickness map

shows a 5-km-thick continental crust underlying the oblique rift. 2D and 3D seismic data shows the SDR belt is 3-to-4 km thick and underlain by an 8-8-km-thick, highly stretched continental crust characterized by sub-horizontal layering and low-angle normal faulting. Structural restoration shows the SDR belt has been locally rotated 17° and stretched by a factor of 7. The oblique rift is continuous with the west-northwest-trending Martin Garcia-La Plata strike-slip fault system that extends 380 km to the northwest along the valley of the Rio La Plata. I interpret this fault system as bounding a microplate activated during the late-stage rifting of the South Atlantic margins. Four 1-D basin models from representative margin areas show that the Aptian source rock is in the gas window and that the Cenomanian-Turonian source rock is in the oil window. ■

Abstracts Presented at Sheriff Lecture *continued on page 24*

# Tectonic Origin of the Bering Sea Constrained by Regional Integration of Geologic and Geophysical data

Estefani Ruiz Toro, MS student, CBTH project, Department of Earth and Atmospheric Sciences, University of Houston, Texas 77204  
(edruizto@cougarnet.uh.edu)



The Bering Sea is the approximate size of Saudi Arabia (2,000,000 km<sup>2</sup>) with an average water depth of 1.5 km. The Bering Sea forms one of the largest, continuous tracts of crust on Earth whose tectonic origin remains controversial. End member hypotheses for its tectonic origin include back-arc spreading along the Aleutian island arc and entrapment of oceanic and oceanic plateau crust following the formation of the Aleutian arc at its southern boundary. This study presents analyses of basin-wide maps of potential field and gravity data to better constrain the tectonic origin of the crust and integrates seismic stratigraphy tied to sparse wells to provide an age constraint on the top basement surface. Regional maps of satellite and ship-based gravity and magnetics reveal a monotonous crustal structure lacking fracture zones, spreading ridges, or hotspot tracks. Inversion of gravity

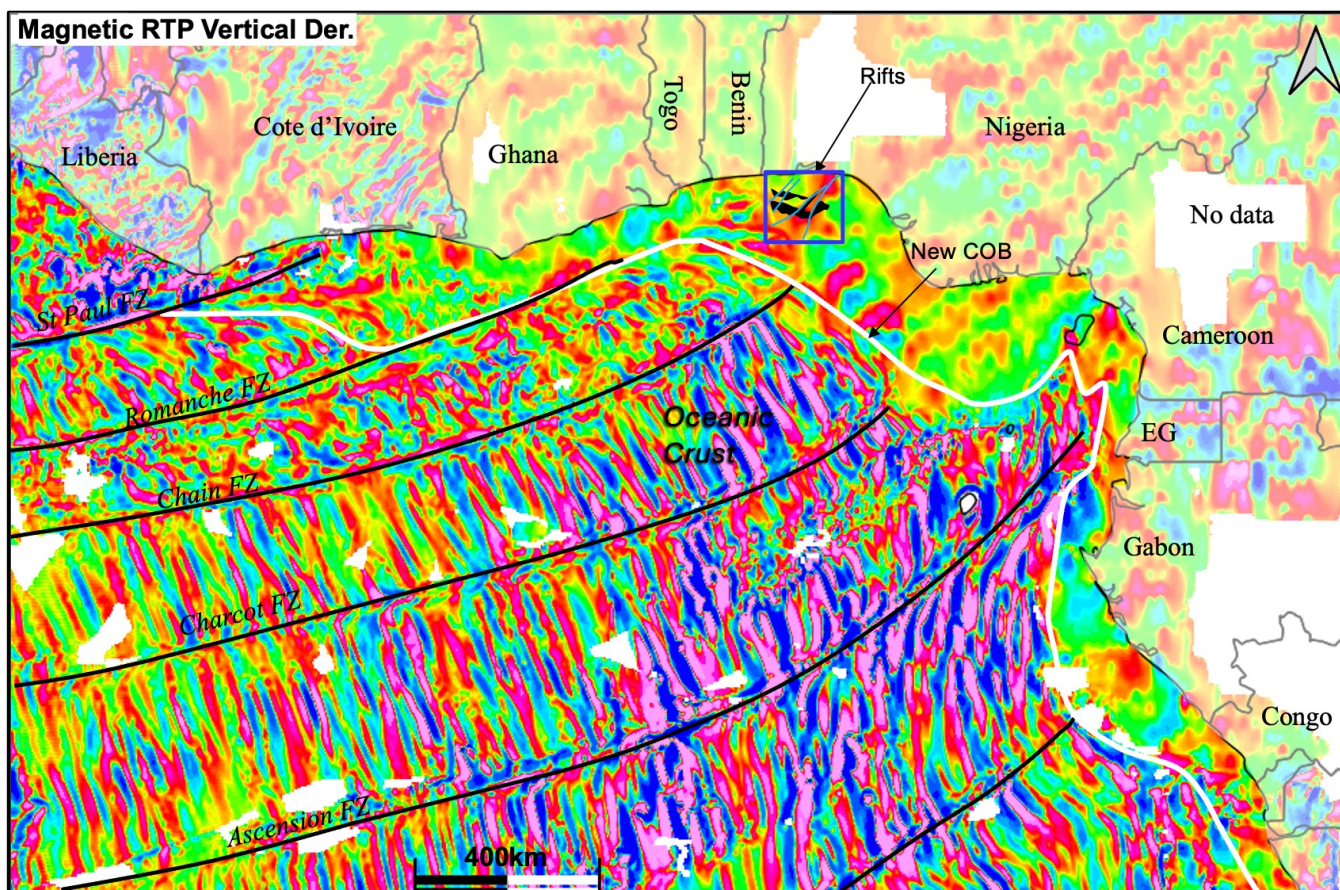
combined with a 2900-km-long, basin-wide 2D gravity model reveals that the crustal thickness varies from 10-33 km. Depth-to-basement calculations and average heat flow (54.4 mW/m<sup>2</sup>) yield an early Oligocene (30 Ma) age of formation for the top basement surface that is consistent with mid-Oligocene volcanic basement dated at DSDP site 191 along with the age of its overlying sediments. Based on these data, I propose that the Bering Sea formed as Late Cretaceous-Paleogene oceanic plateau that moved northwest along moved along the right-lateral Bering strike-slip fault system and collided and accreted to its northeastern margin in Siberia. By the middle Eocene (45 Ma), the Pacific-North America plate boundary had shifted to its present location along the Aleutian Island arc. ■

Abstracts Presented at Sheriff Lecture continued on page 25



# Crustal Structure of the Offshore Niger Delta and Its Implications for Ultra-deepwater Hydrocarbon Exploration

Jumoke Akinpelu, PhD student, CBTH project, Department of Earth and Atmospheric Sciences, University of Houston, Houston, Texas 77204 (okakinpe@cougarnet.uh.edu)



The Niger delta is an established and prolific petroleum province based on a century of exploration and production of Cenozoic plays hosted mainly on the inland delta, shelf, and slope. Progress in understanding the deeper-water, hydrocarbon plays in the study area has been slow because of the need for an integrated reflection and refraction dataset showing the exact locations of rifts in the continental crust that likely contain high-quality source rocks. Magnetic data shows northeast-southwest trending fracture zones and orthogonal spreading fabric in the post-Albian oceanic crust. This Cretaceous oceanic spreading fabric trends at right angles to a northeastern magnetic fabric that was observed in

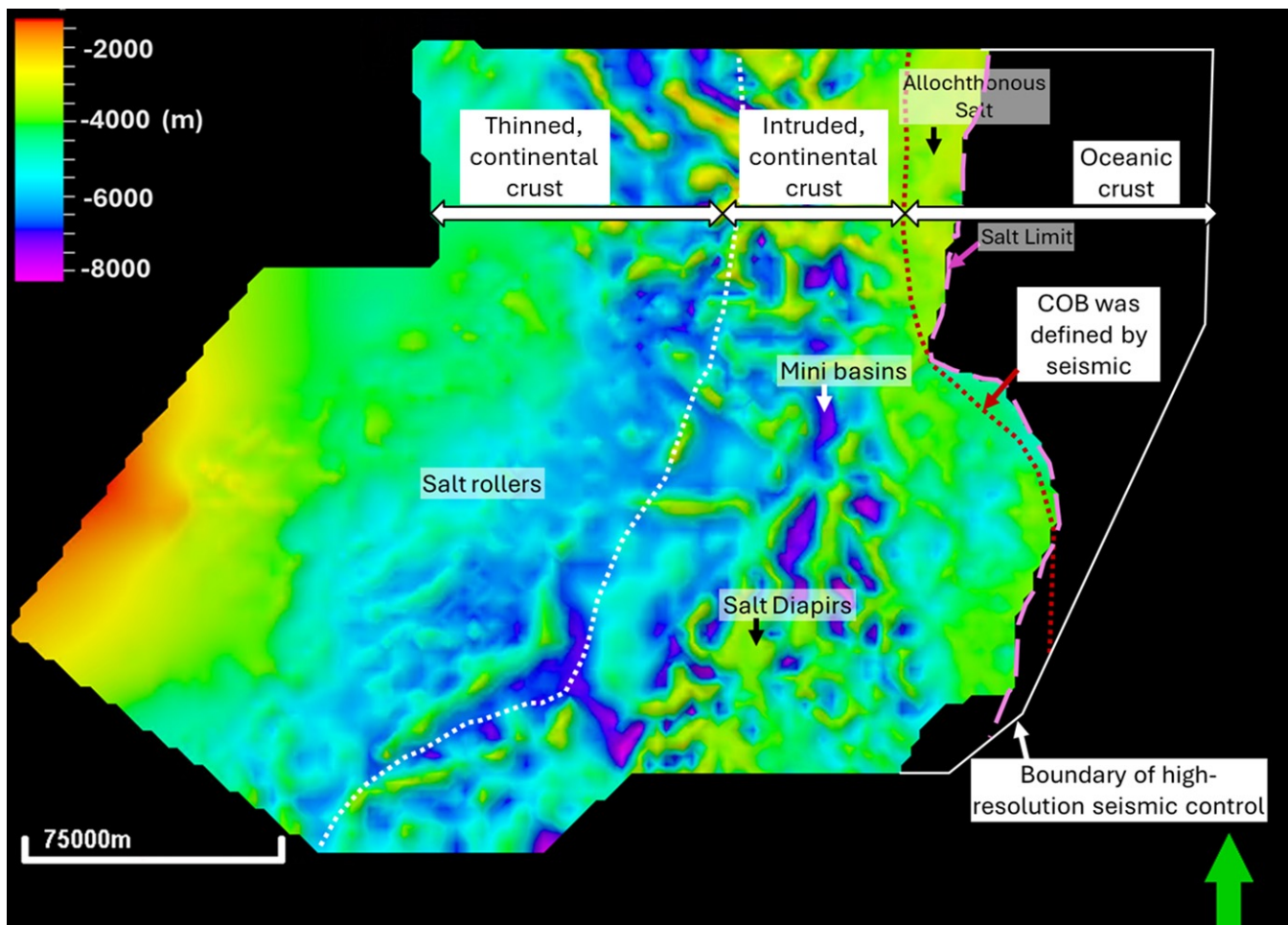
the Precambrian continental crust underlying the Niger Delta. I propose that the new continent-ocean boundary (COB) occurs at the abrupt change between the northwest-trending Cretaceous magnetic anomalies and the Precambrian, northeast-trending crustal fabric. Gravity models support this revised location of the continental rift zone in the western and eastern Niger Delta. This expansion of the continental rift zone expands the fairway for deepwater exploration of Cretaceous-sourced oil and gas as observed in the neighboring countries of Benin, Ivory Coast, and Ghana. ■

Abstracts Presented at Sheriff Lecture continued on page 26



# Gravity and Seismic Characterization of Hyper-extended Continental Crust and Its Transition into Oceanic Crust, Deepwater Campos Basin, Brazil

Ruth Beltran, PhD student, CBTH project, Department of Earth and Atmospheric Sciences, University of Houston, Houston, Texas 77204 (rxbeltran@uh.edu)



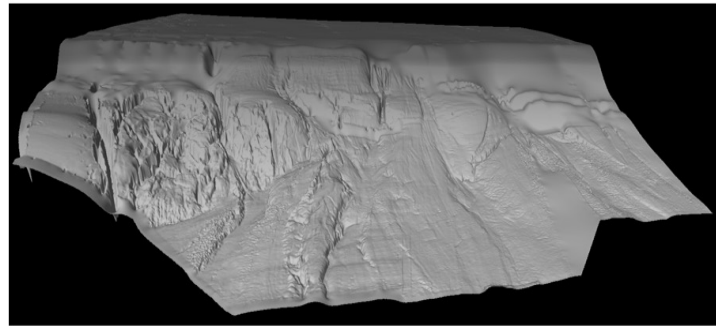
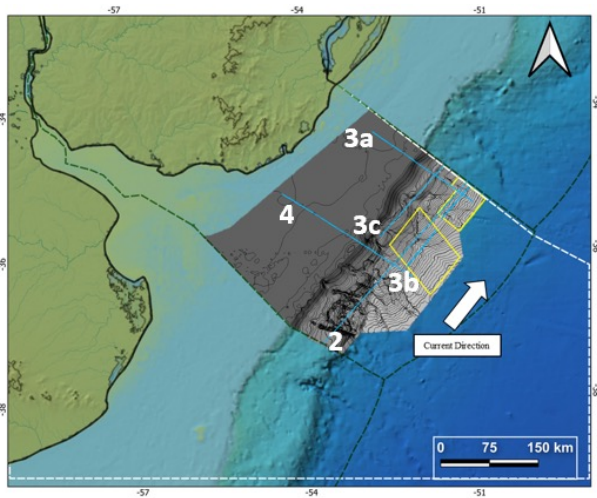
The Barremian/Aptian rifted-passive margin of the Campos basin, Brazil, is underlain by two sub-parallel rift zones: 1) the Internal rift with a 25-km-thick, thinned continental crust; 2) the External rift with a 7-km-thick crust which previous workers have interpreted as either oceanic, thickened oceanic crust, ultra-thin continental crust, or exhumed mantle. This study is divided into two parts. First, I used gravity and magnetic modeling to characterize the undrilled areas of highly thinned continental crust, continental crust modified by magmatism, and normal oceanic crust in the ultra-deepwater area of the External rift. Second, I utilize 32,309 km<sup>2</sup> of 3D seismic data to characterize the Barremian to early Aptian age rifts and the overlying, pre-salt sag basin of the late Aptian age. Results from the first part of the

study tested four possible combinations of crustal types for the distal margin close to the continent-ocean boundary. The best fit from gravity and magnetic data suggests a 7 km thick, highly stretched, intruded continental crust beneath the External rift that transitions into normal (6 km) oceanic crust of Albian age. Results from the 3D seismic interpretation reveal a hyperextended domain with syn-rift sedimentary sections capped by a late Barremian sag sequence with carbonate buildups on structural highs and sedimentary depocenters with potential source rocks like those of the Internal rift. A marginal rift was formed adjacent to the continent-ocean boundary in the Campos basin and along its conjugate margin in Angola. ■

Abstracts Presented at Sheriff Lecture continued on page 27

# Evolution and Tectonic Controls of 50 Million Years of Contourite and Turbidite Sedimentation Along the Deepwater Margin of Uruguay

Joshua Miller, MS student, CBTH project, Department of Earth and Atmospheric Sciences, University of Houston, Houston, Texas 77204 (jmmill30@cougarnet.uh.edu)



In this study, I use a 22,984 km<sup>2</sup> 3D seismic reflection data volume combined with regional 2D seismic lines from the slope of the South Atlantic margin of Uruguay to distinguish the vertical (5 km) and lateral (325 km) Cretaceous succession of deepwater, contourites, turbidites and mixed contourite-turbidite deposits. Based on their distinctive seismic facies and 3D geometries, I sub-divide the 2-km-thick, Albian-Paleocene section into three facies associations: 1) Albian-Cenomanian turbidite seismic facies within a 500-1500-m-thick, 116-long and 37 km-wide submarine fan that are characterized by downslope progradation and low and high-amplitude reflectors symmetrical, channel-levee systems; this period of gravity-driven turbidite deposition occurred during the early opening phase of the South Atlantic when bottom currents were not yet established; 2) Mixed turbidite-contourite seismic facies from Cenomanian-Santonian

characterized by asymmetrical, channel-drift systems; seismic facies include parallel, laterally continuous reflections with erosional discontinuities caused by periodic changes in bottom current regime; this initial period of contour current-driven re-deposition occurred during the intermediate opening phase of the South Atlantic when bottom currents were established over depths ranging from 5 to 6.5 km; and 3) Contourite facies seismic facies from Santonian-Maastrichtian characterized by asymmetrical and lenticular seismic depositional units with adjacent moats, oblique to down current migration, and laterally continuous parallel reflections and erosional discontinuities; this period of strong contour current-driven re-deposition occurred during the more recent opening phase of the South Atlantic when bottom currents were established over depths ranging from 1 to 5 km.



Monday, January 13, 2025

5:30 – 8:00 p.m.

HGS Members/Emeritus/Honorary Life \$65

Students \$25 • Non-Members & Walkups \$75

Norris Conference Center, Citycentre

816 Town and Country Blvd #210 • Houston, TX 77024

<https://www.hgs.org/civcrm/event/info?id=2575>

Event Contact: Catie Donohue

## HGS General Dinner Meeting

James H. Painter

HGS General Dinner Meeting

# Reflecting on the Pitfalls and Successes of a 40+ Year Career in the Oil & Gas Industry

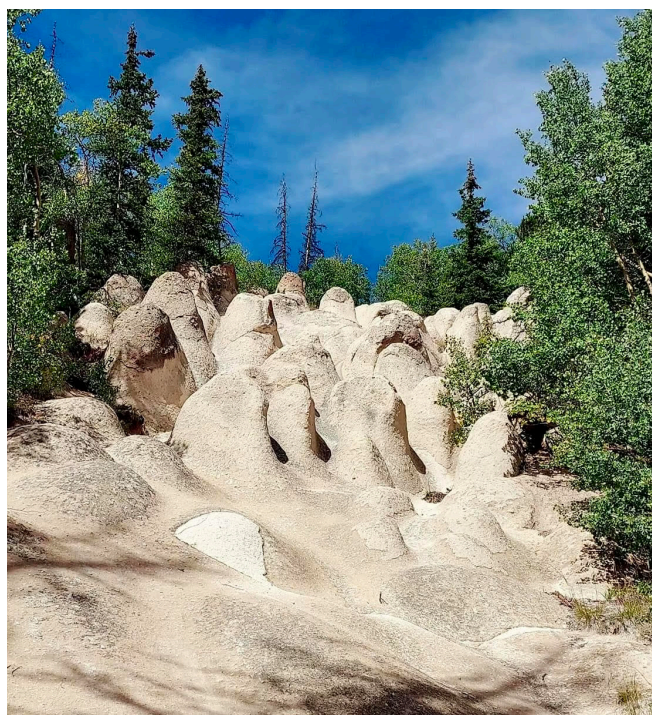
During the presentation/discussion, I will share a lookback on my career in the energy industry. This will include learnings throughout my professional life — as an exploration/production geoscientist and my time in multiple leadership roles (in large and small companies). Additionally, I will provide an understanding of the risk/rewards of startups.

### BIOGRAPHICAL SKETCH



Since March of 2018, Mr. Painter is a Co-Founder of PaintMire, an advisory firm. April 2020 to July 2021 Mr. Painter was a board member of Fieldwood. From 2005 - 2017, Mr. Painter held various positions at Cobalt International Energy. Cobalt was established in 2005, and Mr. Painter was one of the founders of the company. Most recently at Cobalt,

he served as Interim COO and then President, Exploration and Appraisal. Prior to that, he was Executive Vice President of Worldwide Operations and Appraisal. During his 12 year tenure, he served as Executive Vice President in various roles including Exploration, Gulf of Mexico, and Execution and Appraisal. Prior to he and his co-founders starting Cobalt, he was Senior Vice President of Worldwide Exploration and Technology at Unocal Corporation (following the merger between Ocean Energy and Devon Energy). Until the merger with Devon Energy, Mr. Painter held various leadership roles for Ocean Energy from 1995 to 2003 with his final role as Senior Vice President, Gulf of Mexico and International Exploration. From 1980 to 1995, Mr. Painter had various exploration and development roles at Forest Oil, Mobil Oil, and The Superior Oil Company. Mr. Painter has more than 40 years' experience in the oil and natural gas industry. He holds a Bachelor of Science in geology from Louisiana State University.



Photos taken of Wheeler Geologic Area near Creede, Colorado, courtesy of Barry Knott



# JANUARY 2025

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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3

4

**RESERVATIONS** The HGS prefers that you make your reservations online through the HGS website at [WWW.HGS.ORG](http://WWW.HGS.ORG). If you have no internet access, you can e-mail [OFFICE@HGS.ORG](mailto: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](mailto: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.**

Make  
your reservations  
online at  
[hgs.org](http://hgs.org)

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**HGS E&E  
Dinner Meeting**  
TBD  
<https://www.hgs.org/civicism/event/info?id=2612>

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**13 HGS General  
Dinner Meeting**  
*Reflecting on the Pitfalls  
and Successes of a 40+  
Year Career*  
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<https://www.hgs.org/civicism/event/info?id=2575>

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**21 New Energies  
Committee  
Luncheon**  
TBD  
<https://www.hgs.org/civicism/event/info?id=2598>

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**23 HGS Continuing  
Education**  
*Prospect Evaluation  
Methods for Seismic DHIs*  
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## 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](mailto: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).

# Educational Outreach Report for December 10, 2024

*By Phil Caggiano, Chuck Caughey, Steve Johansen, and Janet Combes*



## RECENT EVENTS

### **Young Women College Prep Academy Annual STEAM Family Night - Tuesday 12/3/24 from 5:30 pm - 7:00 pm**

Phil Caggiano, Chuck Caughey, Bob Moore and Nancy Engelhardt-Moore participated in the annual STEAM event at the Young Women's College Prep Academy on the evening of December 3. To attract girls and their parents to their table, Phil supplemented the HGS collection of rocks and fossils with some glistening minerals from his personal collection, and Nancy and Bob showed fossil replicas from their personal collection including a massive, real dinosaur vertebra from Utah. Discussions with students focused on how geology impacts the world around us and attractive careers available for them in geoscience.

### **Texas Master Naturalist Program, Sunday, November 17**

On November 17th, Steve Johansen of the HGS Educational Outreach Committee gave a one-hour lecture to 25 adults studying in the Texas Master Naturalist program. The presentation reviewed the importance of geology in naturalist studies and provided a brief overview of the geological history of Texas. The Texas Master

Naturalist Program is a joint effort of the Texas Parks and Wildlife Department and Texas A & M Agrilife Extension Service. The program trains adult volunteers in the basics of natural history to better inform the wider public. Enrollees in the program are staff and volunteers who work in Texas state, county, and city parks and educators in public and private schools. Letha Slagle and Steve Johansen present these classes several times yearly to Texas Naturalist classes in Houston and Liberty County.

## UPCOMING EVENTS

**Smith Elementary, Alief ISD, is hosting a STEM Night on Thursday, February 6, 2025, from 5:00 PM to 6:30 PM.** The HGS Educational Outreach committee is planning on attending

**Nottingham Elementary School will have Science Night on Wednesday, February 26th, from 5:30 to 7:30 pm.**

The HGS Educational Outreach Committee plans to participate once again – and the organizer said that “the children really enjoy learning about the different rocks!” ■

# Houston Geological Society's Second Annual Sporting Clays Event: A Resounding Success

By David Perez and Magley Cabrera

The Houston Geological Society (HGS) recently hosted its highly anticipated Second Annual Sporting Clays Shoot Tournament, which was a fantastic success! The event drew a diverse crowd from the oil and gas, environmental consulting, and various other industries. It attracted both seasoned shooters and newcomers for a day filled with friendly competition, camaraderie, and plenty of excitement. The tournament was held at the Westside Sporting Grounds on Friday, November 22, 2024. We extend our heartfelt gratitude to our generous sponsors: Tri-Star, Rogii, Silverthorn Seismic, Seisware, Cherami Digital, Ikon Science, Feland's Gunsmithing, and Petrophysical Solutions, Inc. Their support was instrumental in making the tournament possible. A special thank you to our dedicated members, participants, and especially our incredible volunteers, who worked tirelessly to ensure the day ran smoothly. The weather couldn't have been better, providing the perfect backdrop for a day full of camaraderie, skill, and fun. Attendees enjoyed not only the challenge of the clay shoot but also delicious food and a variety of exciting prizes that added to the festive atmosphere.

A highlight of the day was the recognition of the top shooters

## INDIVIDUAL COMPETITION

**High Overall Ladies' Shooter** – Mona Ansley

**High Overall Men's Shooter** – Kris Givens

## TEAM COMPETITION

**1st Place Team** – Terry Thibedeau, Mark Hildebrand, Josh Kleinheksel, Tim Riggs

**2nd Place Team** – Mike Kasecky, Tim McGinty, Greg Nassar, Tom McCarroll

**3rd Place Team** – Carter Breed, Trey Barker, David Gordon, Al Menconi

in both the ladies and men's categories. Mona Ansley claimed the title of High Overall Ladies' Shooter for the second year in a row, demonstrating impressive consistency and skill. On the men's side, Kris Givens took the top spot as High Overall Men's Shooter, showcasing an outstanding performance. Both shooters were awarded beautifully engraved rock hammers as a unique and fitting prize. The event also featured a competitive team category. The first-place team stood out with a stellar performance, while the second and third-place teams were not far behind, displaying remarkable teamwork and sportsmanship.

In addition to the shooting competition, participants had the chance to win various exciting and unique prizes. Some notable items included Megalodon shark teeth, a section of mammoth tusk, a trilobite fossil, gemstone crystals, antique geological maps, shotguns, rifles, pistols, and a crossbow. These rare and intriguing prizes were a big hit with attendees, adding to the fun and excitement of the day. As the event wrapped up, mineral and fossil enthusiasts were already looking ahead to next year's gathering, eager to continue the competition and community engagement tradition.

A heartfelt thanks go to all the participants, sponsors, and volunteers whose generosity and support made the event possible. Their contributions ensured a memorable and successful day for everyone involved. The HGS is already looking forward to next year's event and continuing this tradition of fostering connections within the geological community.

Stay tuned for more updates on upcoming HGS events and initiatives. We look forward to seeing you at next year's Sporting Clays Event! ■

**Second Annual Sporting Clays Event** continued on page 32









# December General Meeting Dinner Gone but Not Forgotten

*By Magly Cabrera and Catie Donohue*



*Featured Panelists from left to right: Dave Toner, Jennifer Smith, Pablo Eisner, Dave Martens, Ken Tubman, and Bil DeMis.*

The Houston Geological Society hosted a memorable dinner and panel discussion on December 9th at the Norris Conference Center, focusing on “Gone But Not Forgotten: Navigating the Impact of Industry Consolidation on Geoscience Careers and Innovation.” The event brought together industry professionals to discuss the challenges and opportunities created by corporate mergers and transitions in the geoscience sector. The panel, featuring accomplished petroleum geoscience leaders such as Bill DeMis, Pablo Eisner, Dave Martens, Jennifer Smith, Dave Tonner, and Ken Tubman, provided valuable insights based on their range of experiences that included work with operators, service companies, independents, and non-profit organizations.

This panel was designed to address the needs of our members experiencing another wave of consolidation and corporate change across the energy industry. The event was well attended by those seeking to receive and give advice and support, as we all recognize the cycles our industry moves through. Strong sponsorship support from Stratum Reservoir, Rohmtek, Diversified Well Logging, and GeoMark Research also helped this meeting.

One of the key takeaways was the importance of understanding not just the technical aspects of our work but also how companies generate revenue, maintain profitability and adapt to market fluctuations. Expanding knowledge beyond geoscience—into networking, personal development, and business acumen—was a recurring theme. As Bill Demis shared, “Be the best geologist possible and have more than one tool in your toolbox!”

The panelists also shared their unique career journeys, highlighting the reality that careers in oil and gas are rarely linear or tied to one organization. Transitions between companies, often driven by

industry fluctuations or evolving work conditions, have become a common thread in our industry. Their stories reminded attendees of the need to remain adaptable and proactive in navigating these changes. Dave Martens reflected on challenges that caused him to deviate from geology as a central task in his early years with Unocal but were ultimately temporary and ultimately set him up for future success. He learned the value of flexibility early in his career and used that skill repeatedly.

The event also sparked thoughtful discussions on leveraging mergers as opportunities and maintaining technical innovation through periods of transition. It was inspiring to hear how professionals across the industry are navigating these challenges and using them as catalysts for growth. Dave Tonner of Diversified had many examples of how his current company results from his ability to recognize key problems for which he actively built new solutions. These were gaps not being addressed by current services, but he had the experience, energy, and focus to provide something new.

The evening was a great success, combining professional insights with opportunities for networking and community building. The Houston Geological Society thanks all panelists, attendees, and sponsors for making the event possible. HGS also used the evening to introduce a new mentorship program that will be starting in the coming year. This program will seek to support all our members, regardless of their current experience level. As stated by our panelists, the best geoscientists are always learning, and the HGS is ready to provide connections and opportunities for members as they look to expand their skills, change career focus, and develop professionally. We look forward to continuing these important conversations in the future. ■

**Gone but not Forgotten** continued on page 34





*From left to right, Jadranka Milovac, Catie Donohue, Brian Horn, Ann Stachura*



*Katya Casey, Bill DeMis, and Steve Carlson*



*Sergio Sarmiento, Gerald Stachura, and Dave Tonner*



*Dave Martens and Bryan Gottfried*

# Science and Engineering Fair of Houston: Join Us in Making a Difference in 2025!

*By Dorene West, Chair, Science and Engineering Fair Committee,*

**A**re you enthusiastic about earth sciences? Do you enjoy listening to students talk about geology? If so, share your love of geology by joining the HGS Special Awards Agency team of volunteer judges at the annual Science and Engineering Fair of Houston (SEFH) on Saturday, February 15, 2025, at the Fort Bend Epicenter, 28505 Southwest Fwy., Rosenberg, TX 77471.

## HGS SPECIAL AWARDS

The HGS team reviews Earth science-related projects in the Junior and Senior Divisions at the SEFH. Phase II and Special Awarding Agency Judging is from 1:15 PM—4:15 PM Saturday afternoon. We give two types of awards: rank and internships. HGS Special Awards are meant to encourage students to pursue Earth science-related careers.

## RANK AWARDS

A top project is chosen for each division, and 2nd and 3rd place projects are chosen for the Senior Division. After judging ends, HGS presents these winners with a certificate, and congratulation letters are sent to parents and teachers. Winners are recognized at Guest Night (if held in June).

## INTERNSHIPS

Through our membership in The Engineering, Science, and Technology Council of Houston (ECH), HGS funds three summer interns at the Houston Museum of Natural Sciences (HMNS). These Finalist HMNS Summer Intern Awards are nominated by HGS but awarded to three Senior Division finalists by ECH. Students must meet work requirements (so they are not necessarily the top-ranked project winners). The awardees are invited to an ECH awards banquet (or Zoom meeting), where the students showcase their projects.

## CHALLENGES IN JUDGING

An effort has been made to remove “community bias” from our judgment. Students are judged on their individual efforts; those with fewer resources cannot compete with student projects from areas with more resources/community support. We are charged with encouraging students to participate in STEM and not penalizing students from schools/communities with fewer resources.

## SEFH PLACE JUDGING

There are also opportunities for HGS members to volunteer in the Saturday morning SEFH Place Judging session. Some Place Award Judges are assigned to review projects that have advanced to Phase II on Saturday afternoon (if you volunteer to be a Place Award Judge, you may not be able to serve as a Special Award Judge for HGS). Judging ends at 4:00 PM; the public can view projects from 4:30 PM to 6:30 PM.

To volunteer as a Place Award Judge (in any category), register on the SEFH 2025 website at <https://sefhouston.org/for-judges/#Signup>.

HGS members can volunteer to be an HGS Special Awards judge on Saturday afternoon; please email Dorene West ([dbwesthou@earthlink.net](mailto:dbwesthou@earthlink.net)); please put ‘SEFH Special Awards judging’ in the subject line).

Additional info: <https://sefhouston.org/general-information/> or <https://sefhouston.org/for-volunteers/>. ■



# HGS's 2024 Holiday Party

By Penny Patterson, HGS President,

The Houston Geological Society helped bring forth much cheer, merriment, and warm tidings of the holiday season by hosting the **Third Annual HGS Holiday Party**, held on December 16, 2024, at the Cadillac Bar. The holiday party was a festive, fun-filled evening with a sell-out crowd of over 160 attendees! Woo-Hoo! Way to celebrate, HGS! Partygoers included HGS Board Members and their spouses, HGS members and volunteers, and their spouses, potential new HGS members and their spouses, our HGS staff, and, of course, Santa T-Rex, aka the holiday party

decoration dinosaur. T-Rex brought party favors for the attendees of his favorite food, T-Rex cookies!

As you will see from the photographs, the holiday spirit was celebrated by all with much cheer and laughter. HGS extends sincere thanks to Thunder Exploration, Inc., and Patterson Geoscience Group, LLC, for their generous sponsorships. Please mark your calendar for next year's HGS Holiday Party celebration! ■

**HGS's 2024 Holiday Party** continued on page 37



*HGS Third Annual Holiday Party with over 120 attendees!*



*T-Rex party dinosaur decoration with one of his party favors of a T-Rex cookie!*



*Townes Pressler, Penny Patterson Pressler (HGS President) and Glenn Lowenstein (HGS Treasurer) who is sporting a T-Rex shirt and holding the T-Rex party dinosaur!*





*Magly Cabera doing a selfie with John Patterson and his wife and Justin Vander Brink*



*Andrea Peoples (HGS Office Manager) presenting John Tubb (Past HGS President) a gift of geology socks!*



*Penny Patterson (HGS President) and Linda Sternbach (Past HGS President)*



*Penny Patterson (HGS President) and Patty Walker (HGS President- Elect)*



*Richard Beard and Norman Pullman*



*Paul Britt (HGS Past President) and Henry Wise*



# Remembrance

## MIKE BARNES

8/19/1941 – 11/24/2024



**MIKE BARNES**, passed away on November 24 at the age of 83. Always with a smile, he frequented HGS meetings and SIPES luncheons and represented the HGS at AAPG House of Delegates meetings and events. He joined the HGS in June 1967. In 2002, he received the HGS Rising Star Award and served as a Director on the Board of Directors from 2002 to 2004. He joined the AAPG in 1972 and was proud to be a Certified Petroleum Geologist. He served on Houston's AAPG House of Delegates from 2000 to 2007 and 2017 to 2020. He was also a member of SIPES, GSH, and SEG. Mike was a founding member of the Houston lunch group Onshore Exploration Independents over 30 years ago and a cofounder of the Onshore Exploration Independents 2.0 that grew out of the original OEI group.

His biography cites his experience in prospect generating and field studies, unitization, and planning in the Gulf Coast, Tyler Basin, and Mississippi Salt Basin. His bio expressly lists providing "advice on how not to screw up a project." You had to know Mike.

His complete obituary follows.

It is with deep sadness that the family of Michael Allen Barnes announces his passing on November 24, 2024, at the age of 83 due to unexpected surgery complications. Born on August 19, 1941, in San Diego, CA. His birth parents were Ima Ree and Charlie Chamness. He was adopted at age 8 by Ray and Bessie Barnes of Ferris, Texas. Mike spent his school years in Ferris and Lancaster, Texas, where he met the love of his life, Dorothy Tuley, during his senior year. They married on August 1, 1959, and shared 65 years of love and memories.

His family and friends cherished Mike, known for his kindness and devotion as a husband and father. He is deeply missed by Dorothy, their children Eric and Kelly, and Bruce, who welcomed him to his heavenly home. Their little dog, Harley, is also mourning his absence.

An avid outdoorsman, Mike loved fishing and hunting, cherishing trips to Beeville, Fayetteville, and Alaska, eagerly anticipating each adventure. He earned a B.S. in Geology with minors in math and biology from the University of Texas at Arlington in 1967, supported by a major oil company scholarship his senior year. He began his career with Texaco in Houston, where he worked in the oil and gas industry, holding several VP positions at several other companies in Houston. He was a member of numerous professional affiliations. Even in retirement, he continued working on his "Hackberry" project and was proud to be a Certified Professional Geologist.

Mike is survived by his wife, Dorothy; son, Eric; daughter, Kelly; brothers, Bill Palmer and Helena; Montey and Laurreta Chamness; sister, Dana Gately; and many cousins, nieces, and nephews.

A Celebration of Life and Memorial Service was held at 11:00 a.m. on Tuesday, December 10, 2024, at Garden Oaks Funeral Home, 13430 Bellaire Blvd., Houston, TX 77083, with a reception. In lieu of flowers, donations may be sent to 2806 S. Blue Meadow Cir., Sugar Land, TX 77479.



## HGS Membership Application

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

Phone: (713) 463-9476

Email: [office@hgs.org](mailto: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 \$36.00 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 \$36.00 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) **\$36.00** \_\_\_\_\_

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:** \_\_\_\_\_

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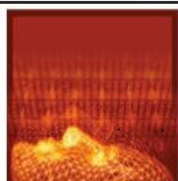
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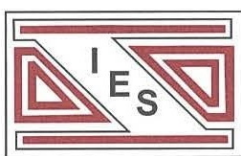
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## Mustafa Touati

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[lisa@lisakruegerdesign.com](mailto:lisa@lisakruegerdesign.com)

## **Ted Godo**

Geological & Geophysical Consulting

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Email: [GeodogExploration@gmail.com](mailto:GeodogExploration@gmail.com)

Website: [GeodogExploration.com](http://GeodogExploration.com)

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*Pioneer Cabin is located up Coral Creek Trail east of Sun Valley, Idaho. Mountain views are of the Pioneer Mountain Range of the Sawtooth National Forest. The highest mountain is named Hyndman Peak at 12,012 feet. Photo taken in 2011, courtesy of Ted Godo*