HGS Bulletin
Houston Geological Society
Volume 56, Number 9
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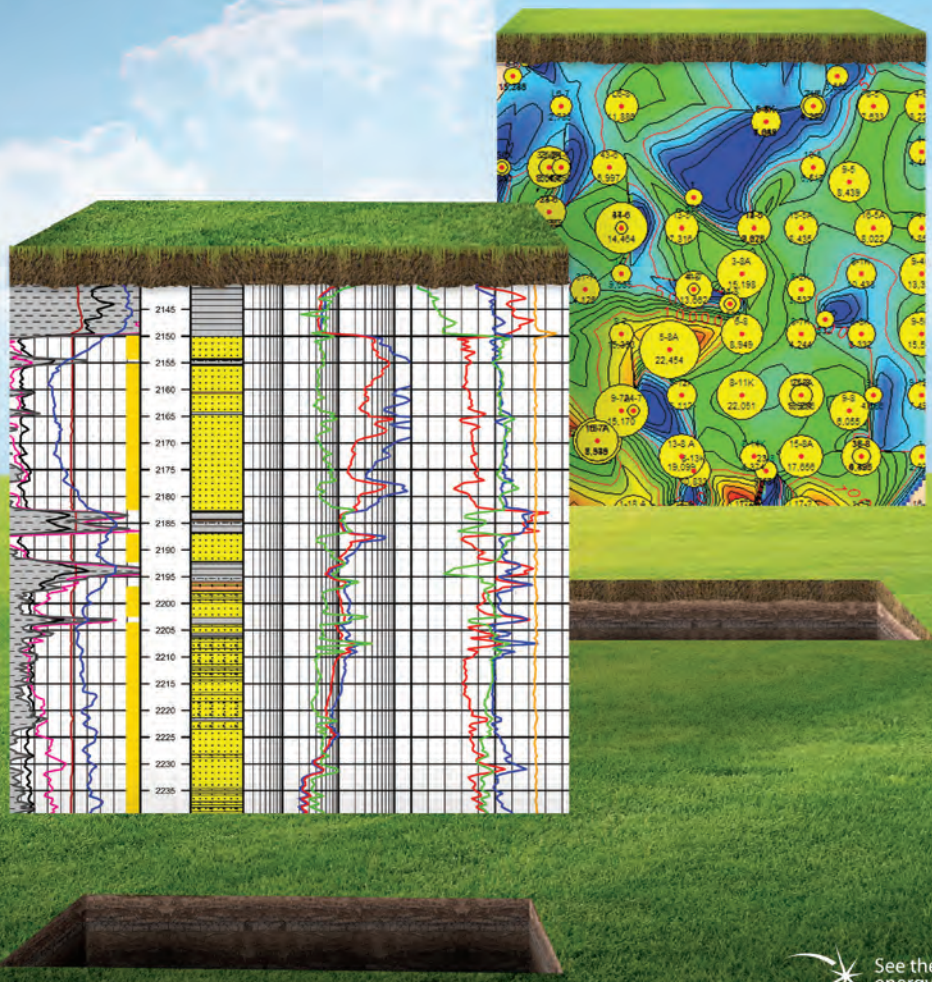

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The Bulletin
Houston Geological Society

Volume 56, Number 9 May 2014

In Every Issue

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The Houston Geological Society Bulletin (ISSN-018-6686) is published monthly except for July and August by the Houston Geological Society, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916. Phone: 713-463-9476; fax: 281-679-5504

Editorial correspondence and material submitted for publication should be addressed to the Editor, Houston Geological Society *Bulletin*, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916 or to hgs.forlenza@gmail.com

Subscriptions: Subscription to this publication is included in the membership dues ($24.00 annually). Subscription price for nonmembers within the contiguous U.S. is $50.00 per year. For those outside the contiguous U.S. the subscription price is $75.00 per year. Single-copy price is $8.00. Periodicals postage paid in Houston, Texas.

POSTMASTER: Send address changes to Houston Geological Society Bulletin, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916

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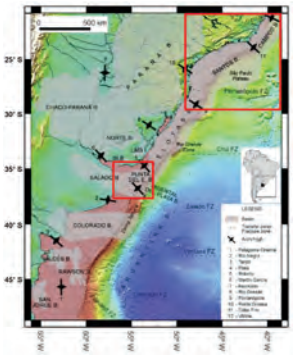

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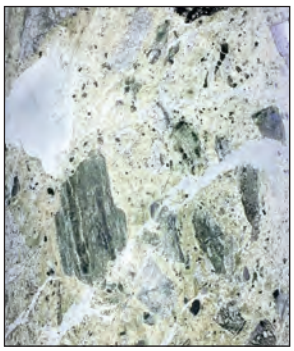

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About the Cover: Owens River, meandering across a floodplain at the northern margin of the Long Valley caldera, California. View is northeastward over Pleistocene basalts towards faulted Mesozoic granitoids, overlain by Pliocene to Pleistocene volcanic rocks.
Photograph courtesy of Dr. Marli Miller, University of Oregon (http://www.marlimillerphoto.com/)

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Three Things to Consider

I have two remaining opportunities to speak to you through my monthly letter. My last note will be a general overview of the year's highlights. Therefore, I would like to remind the membership of my three major themes and hope that you may consider adopting at least one as your professional career continues.

First, there is a need to volunteer. Volunteers remain the life blood of professional organizations such as the Houston Geological Society. Without committee chairs and active committee members and officers, HGS either would not function or, alternatively, the cost of membership would be so high that individuals would no longer continue to be dues paying members. The costs associated with the paid staff necessary to replace our volunteers would be astronomical. At some point in our careers, we have all benefited from this organization or some other professional organization, directly or indirectly. HGS provides opportunities for training, professional development, and networking. It is only fair that we give something back, and that is more than just returning our dues payment of $24.00. Remember, that it is a small group of volunteers that search out the presenters for the multiple meetings that we conduct each month, organize short courses and major conferences, conduct our outreach programs, and aid in maintaining the business functions of the organization. There is a continual need to refresh the ranks of these individuals. Responsibilities change at the office. People are relocated. People retire. Consider giving a little so that we may all benefit!

At some point in our careers, we have all benefited from this organization or some other professional organization, directly or indirectly.

Next, consider engaging yourself in mentoring. Each of us has something that we can pass on to the next generation. For those of us that are nearing the close of our professional careers there is much that can be shared. There are many intangibles that can't be found in text books or publications that can be transmitted. Life's experiences teach each of us many things and the passing of this knowledge from one generation to the next is paramount. I believe that it is particularly important in an industry such as ours.

The cycles that have persisted tend to have a developed a bimodal staffing model – one group quite experienced and one group very junior. It is not only how to use the tools of the trade and the specifics of one basin, play, or well that need to be transmitted. It is also how to be successful in one's career. Things such as how to set career goals, select the next assignment, deal with management, and even give an effective presentation.

For those just beginning their careers, you are looking for mentoring but I believe that you, too, need to become mentors to those who are still in school. In your brief careers, you have already learned a great deal. You can effectively transmit the areas that one should focus on, the importance of soft skills, and simply what to expect after beginning your career. Yes, mentoring takes time and may not be considered part of the "day job," but there are significant benefits to both sides of the relationship which I believe make it worth pursuing. It is clear what the benefits are to the mentee. For the mentor, I find that mentoring others is an opportunity to recharge and rethink. It has provided me the opportunity to go back and think about things that I had learned some 35 years ago in a new light. After all, much has advanced since I was in school. There are new techniques and concepts that can change the framework that we use. Thus, mentoring also provides the mentor an opportunity to grow and learn. Also, since we all learn from stories it provides an opportunity for mentors to have fun and simply tell stories. Consider mentoring, it is worth the investment of your time!

My third theme remains the need for continuous learning. There are new tools, new data types from new locations, and new concepts. Just think about the growth of unconventional resource plays, for both oil and gas, over the past decade. When I started in my career, fine grained rocks were considered a seal or possibly a source for hydrocarbons. Today, they are considered a potential reservoir as well. We are still learning how to exploit these reservoirs, just as we have been learning how to fully recover the resources in conventional reservoirs for more than a century.

From The President *continued on page 9*

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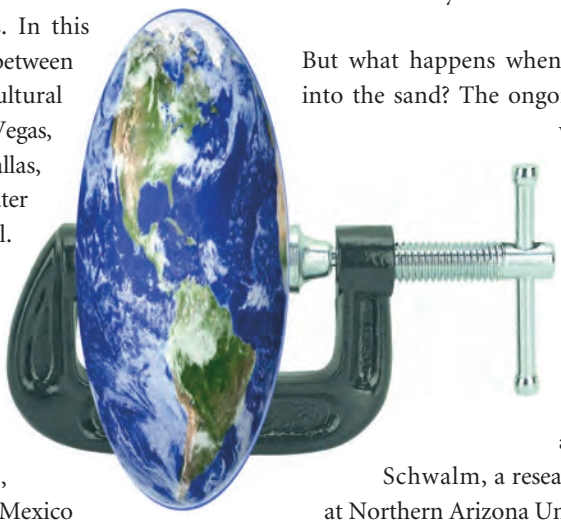
Michael F. Forlenza, P.G.
hgs.forlenza@gmail.com

Turn of the Screw: Drought and Conflict in the American West

The American West is a place of myth, a place of raw beauty, and, for nearly 200 years, a place of opportunity. But it is also a place of conflict. Conflict in the West has often involved access to water. A century ago, conflicts over water were between farmers and ranchers. In this century, increasingly, the conflicts are between cities and rural areas including agricultural interests. Burgeoning cities such as Las Vegas, Phoenix, San Antonio, Los Angeles, Dallas, and El Paso have rising needs for new water sources as their populations swell. This growing municipal thirst is a challenge to earlier established water access rights and water distribution relationships especially as drought squeezes scarce supplies.



Fortunes have been made in Texas, Arizona, California, Nevada, and New Mexico in agriculture, ranching, mining, gaming, recreation, energy, and development. For many decades, fast-growing, sun-washed cities in the region attracted people seeking a place to start anew and prosper. Cheap land and available resources lured entrepreneurs, retirees, recreationists, and businesses to this arid land. This frenzy of growth was lubricated by seemingly limitless supplies of fresh water pumped from relict groundwater or transported across the baked landscape by vast government projects. This cheap supply kept electrical generating facilities humming, maintained verdant lawns and golf courses, filled shimmering reservoirs, and slaked the thirst of lush fields of cotton, grain, fruits, and vegetables.

> In the West, whiskey is for drinking and water is for fighting.
>
> Unknown Author (attributed to Mark Twain)

But now, with limited water supplies stretched thin by years of lingering, grinding drought, and growing demand from cities, the rural water users and agricultural customers are feeling the weight of municipal power and influence. Cities have more political clout than rural areas because they have more representatives in the state legislatures and more votes in the U.S. Congress. They also have more money, allowing them to spread their reach across great expanses in the quest for diversified water resources. There is a truism in the American West that "water flows uphill towards money."

But what happens when the rain stops and the rivers drain into the sand? The ongoing drought presents a major risk to water resources across the parched landscape. Historically, water has been distributed through a complex series of local, state and regional water-sharing agreements and laws. Virtually every drop of water flowing in the American West is legally claimed or allocated, sometimes by several users, and the demand is increasing as populations grow. Christopher R. Schwalm, a research assistant professor of earth sciences at Northern Arizona University, stated in an August 2012 *New York Times* article titled, "*Hundred-Year Forecast: Drought,*" that many Western cities fundamentally have to change how they acquire and use water. Some regions will become impossible to farm because of lack of irrigation water and thermoelectric energy production will compete for limited water resources.

Colorado River

Water users in the American West have relied largely on the largess and engineering of the federal government to manage and move water. One of the earliest, and still the keystone, of these immense government water projects is Boulder Dam. Renamed Hoover Dam, it was constructed between 1931 and 1936 in Black Canyon just south of Las Vegas during the dark days of the Great Depression. Hoover Dam was designed to impound the Colorado River to create Lake Mead, manage the resources of the river, and generate electricity. "The Colorado River is the lifeblood the American Southwest," said Jeff Weider in an Op-Ed piece published in April 2013 titled "*Why Many American Rivers Are Running on Empty.*" The river provides drinking water for over 36 million people across seven states, irrigates 15 percent of our nation's agricultural output, and supports a $26 billion recreation economy.

From The Editor *continued on page 9*

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From the President continued from page 5

Our efficiency and recovery rates have grown because of continued intellectual growth. Recovery in many fields now exceeds 50, 60, or 70%. These values are considerably higher than the original projections of 20 or 30%.

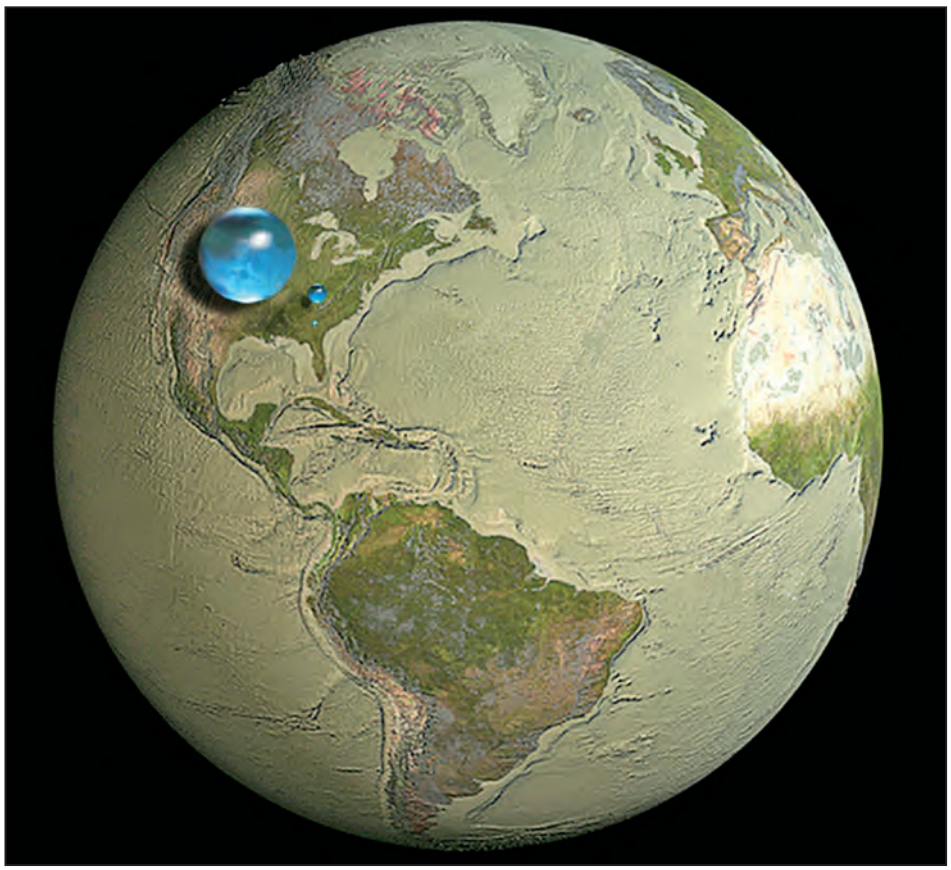
We have clearly expanded our understanding well beyond "anticlinal theory." We have pushed beyond the shelf-break into deepwater. When I was in school, the idea that a sand could be present beyond the shelf did not exist. Now we are producing from deepwater. So what steps might someone take to pursue this goal? My approach each year has been to pick a topic that I would like to know more about. I read as much as I can on the subject, attend an occasional meeting on the topic and prepare myself to make a presentation. It has often been said that there is no better way to learn a topic than to teach, or in my case, present on it.

Not everyone may wish to go to the concluding step of presenting the results of their knowledge journey. However, I find that it requires that I organize my thoughts on a topic and merge the information available from many into my own, hopefully coherent, perspective that can be validated by others interested in the field. I am writing this while on a trip to Nigeria to kickoff a major mentoring program and our managing director has asked that each of the employees come back each day a little smarter than the day before. Clearly that is something we should each consider for our own development!

I hope that these suggestions are remembered, at least in part, and that you act on them. I believe that you and our geologic community will be better off. ■

Until next month…

From the Editor continued from page 7



A representation of a desiccated Earth with all of the world's water gathered into one sphere. The largest sphere over the central U.S. represents all of Earth's water, and its diameter is about 860 miles. It would have a volume of about 332,500,000 cubic miles (mi^3). The sphere includes all the water in the oceans, ice caps, lakes, and rivers, as well as groundwater and atmospheric water.
The smaller blue sphere over Kentucky represents the world's liquid fresh water (groundwater, lakes, swamp water, and rivers). The volume comes to about 2,551,100 mi^3, of which 99 percent is groundwater, much of which is not accessible to humans. The diameter of this sphere is about 169.5 miles.
The tiny blue sphere over Atlanta, Georgia represents fresh water in all the lakes and rivers on the planet, and most of the water people and life of earth need every day comes from these surface-water sources. The volume of this sphere is about 22,339 mi^3. The diameter of this sphere is about 34.9 miles. Source: USGS

From The Editor *continued on page 11*

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From the Editor continued from page 9

In December 2012, the U.S. Bureau of Reclamation, the federal agency charged with managing the Colorado River, released a report emphasizing that there is not enough water in the river to meet the current demand, let alone support future demand increases. The reported noted that more water leaves the Colorado River than enters it each year because of chronic drought, population growth, energy development, and climate change. In the last 13 years, water storage in the basin has decreased by 40 percent. A smaller pie means that someone will go hungry.

New Mexico

In parched New Mexico, the Rio Grande has run dry. Some wags have dubbed the water course the "Rio Sand." The dismal conditions of 2011 and 2012 resulted from the warmest and driest two-year period in New Mexico since forecasters began keeping records more than a century ago. In 2012, precipitation was just 60 percent of normal. The lingering multi-year drought in New Mexico has punished rural communities and the agricultural industry.

A dispute erupted at the 2014 meeting of the Tri-State Compact Commission in Santa Fe. The Compact, formed in 1939 by the governors of New Mexico, Colorado, and Texas, manages the resources of the Rio Grande. Representatives of Texas have asserted that New Mexico is withdrawing so much groundwater that the flows of the Rio Grande into Texas have been diminished, violating the terms of the Compact. Logan Hawkes reported in the *Southwest Farm Press* in March 2014 that the New Mexico Attorney General Gary King countered the claim and argued that groundwater was being pumped along the length of the river, including in Texas, and said that groundwater was not part of the Compact agreement. This conflict has moved to the U.S. Supreme Court.

"We are really facing some extraordinary challenges," said Dennis McQuillan with the NM Drinking Water Bureau. He pointed to residential wells outside of Santa Fe that are going dry and the potential for the city of Clovis to drain its aquifer in the next 20-40 years.

From the chile fields and pecan orchards of the Hatch and Mesilla valleys to Albuquerque, Santa Fe, and beyond, New Mexicans are facing tough choices and dire consequences reported Susan Montoya Bryan in an article titled, "*NM grapples with tough choices*," published in Associated Press in March 2013. New Mexico is now a major producer of pecans, generating millions of dollars for the state's economy. Unlike the unplanted fields of seasonal crops, the decades-old trees cannot go a year without water. Pecan trees, native to the southeastern United States, can tolerate the searing summer temperatures, but they must have some water to survive. Pecan growers rely mostly on wells to irrigate. But without a flowing river, the aquifers that feed the wells have little chance of being recharged. "When that river is flowing, everything is fine," said Dickie Salopek, whose family has hundreds of acres of pecan trees in Dona Ana County, the top pecan-producing county in the U.S. "When it's not flowing, you'd better be thinking outside the box."

Texas

In 2011, Texas suffered through its worst one year drought in history. Wildfires raged across the state, millions of trees were lost, livestock herds were decimated, hay was trucked in from hundreds of miles away, river flows diminished to historic low levels, and reservoirs dropped to catastrophic levels under an unrelenting sun. The Governor, citing "dire conditions" across the state, "higher than normal temperatures," and low rainfall issued an emergency disaster proclamation and designated April 22 - 24, 2011 as official days of prayer for rain. On January 23, 2013, the Governor issued a renewed drought disaster proclamation because "drought conditions have reached historic levels and continue to pose an imminent threat to public health, property and the economy."

The mounting precipitation deficits across most of the state stress both water supplies and wildlife. "We're going into the third year of drought," Matthew Bochat, of the Bee Country Agricultural Extension in South Texas said recently, and some farmers are "just hanging on." Two significant reservoirs, Buchanan and Travis, are only 38 percent full and water inflows are at a record low. And for the third consecutive year it is unlikely that any water will be released downstream. The Lower Colorado River Authority that oversees the reservoirs prioritizes its users. The highest priority users are the municipal clients and industrial customers such as power plants that need water to make electricity. Downstream rice farmers who need water for irrigation and the salty Gulf Coast bays that require freshwater inflows to maintain healthy ecosystems, are cut off during years of drought, as has happened since 2012.

In south Texas, the Rio Grande provided year-round irrigation water to generations of citrus and melon growers. But the Rio Grande, shrunken by years of drought and ever greater demand, no longer provides a reliable source of irrigation water. Part of the deficit is related to a simmering water conflict between Texas and Mexico stemming from a river sharing agreement signed on February 3, 1944 known as the "Treaty of the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande." Under

From The Editor *continued on page 13*

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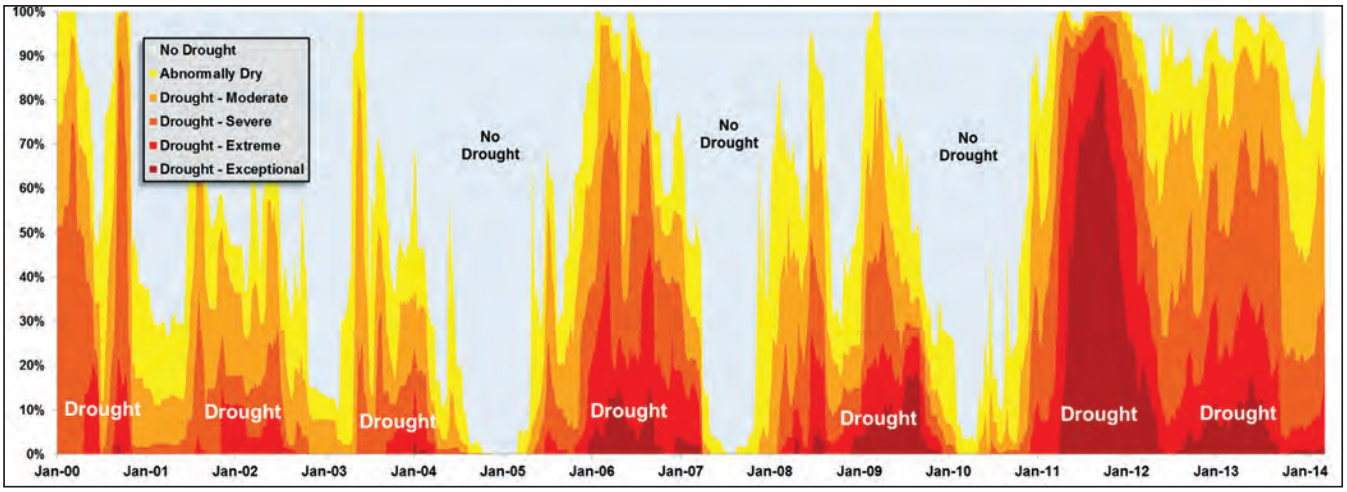
From the Editor continued from page 11



Drought conditions in Texas as a percentage of land area January 2000 to March 2014. Source: U.S. Drought Monitor

the treaty, Mexico is required to release 1.75 million acre-feet of water every five years to the U.S. from six tributaries that feed into the Rio Grande. (An acre-foot is roughly 326,000 gallons.) Ideally, Mexico would deliver an average annual amount of 350,000 acre-feet. In exchange, the U.S. delivers water from the Colorado River to Mexico.

The Texas Commission on Environmental Quality says that Mexico is behind on delivering the water under the terms of the treaty and owes the U.S. 471,000 acre-feet of water. According to June 2013 reporting in the *Texas Tribune* by Julian Aquilar, Mexico only provided 49 percent of its obligation in 2012 only 6 percent in 2013.

An interesting new battleground in the struggle for water in Texas is the fight for sewage treatment plant effluent. In a January 2014 article in the *Texas Tribune*, Neena Satija reported that San Antonio is seeking to declare ownership of its wastewater. Every year, the San Antonio Water System (SAWS) treats close to 33 billion gallons of wastewater and discharges it into the San Antonio River. Because Texas water law says all surface water is owned by the state, the city effectively cedes ownership of the effluent once it is released into the river. "What we'd like to do is to get authorization to retain ownership of that water, even after it's put into the river," said SAWS spokesman Greg Flores III. "We do own that asset. Our ratepayers own that asset."

But apportioned water users downstream from San Antonio's wastewater treatment plant are ready to fight back. Bill West, general manager of the Guadalupe-Blanco River Authority (GBRA), a water supplier and hydroelectric provider for 10 south Texas counties, said it would present a major challenge. For decades, the GBRA and companies including Dow Chemical have held water rights that depend on SAWS' wastewater, he said. "In dry years, those water right holders use the majority of that water," he added.

SAWS and GBRA have been scrapping over water supplies in various Texas river basins since 2005 when SAWS backed out of a planned collaboration. Even some legislators have said that San Antonio has been too aggressive in the hunt for new water sources in rural areas, according to a March 2014 report in the *New York Times* titled "*Growth Tests San Antonio's Conservation Culture.*" "When San Antonio comes into the room, there's definitely a reaction that I've noticed: 'Who loses on this deal for the benefit of San Antonio?' " said State Representative Lyle Larson. This is an example of the golden rule of water supplies: Whomever has the gold, makes the rules.

Houston has also relied on reused wastewater effluent for decades. The Trinity River passes through the heart of Dallas and continues southeast another 200 miles through piney woods and past Houston before draining into Galveston Bay. Dallas returns much of the water it uses to the river in the form of treated wastewater. Downstream, Houston residents rely on that flow of reused water for municipal consumption. "Every drop of water that's being consumed in Houston has been through the wastewater treatment plants in Dallas and Fort Worth," said Andy Sansom, director of the Meadows Center for Water and the Environment at Texas State University.

California

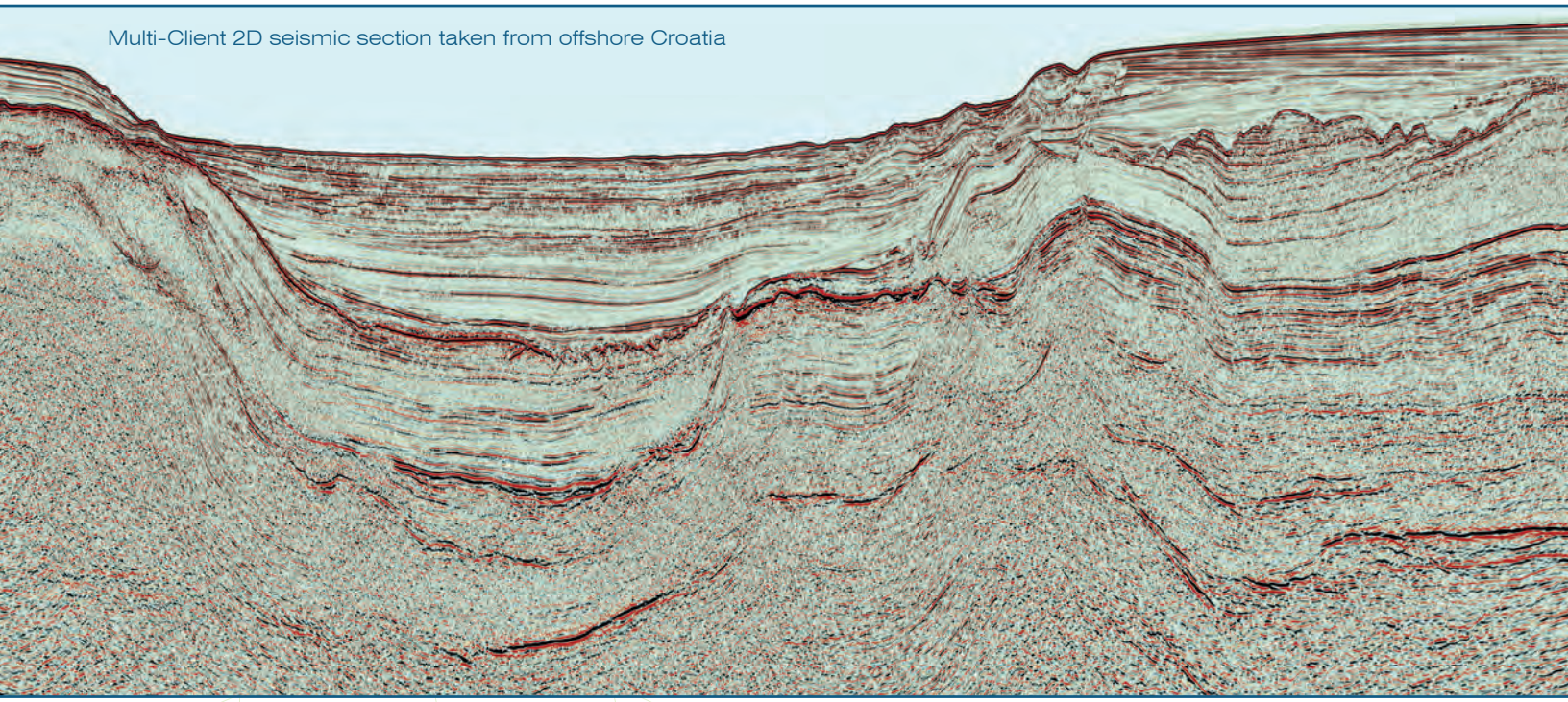
This year California is feeling the tightening grip of drought. In 119 years of hydrologic data, 2013 was the driest calendar year for the state of California. On January 17, 2014, California Governor, Jerry Brown, declared a drought state of emergency and directed state officials to take all necessary actions to prepare for drought conditions. "We can't make it rain, but we can be much better prepared for the terrible consequences that California's drought now threatens, including dramatically less water for our farms and communities and increased fires in both urban and rural areas,"

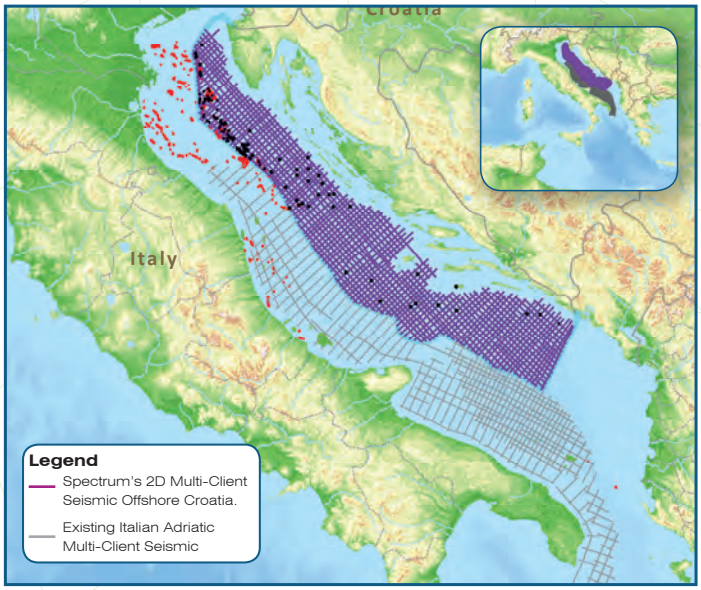
From The Editor *continued on page 15*

Offshore Croatia

A New Oil Province at the Heart of Europe

Multi-Client 2D seismic section taken from offshore Croatia





Spectrum has acquired a truly unique Multi-Client seismic survey offshore Croatia. This is the only seismic data available to license in this hugely underexplored region which has now opened its first offshore licensing round.

The survey, acquired under contract to the Ministry of the Economy in Croatia, covers approximately 14,700 kilometers of long offset seismic data with a 5 km x 5 km grid. It extends across most of the Croatian Adriatic Sea and connects with Spectrum's reprocessed seismic data covering the Italian Adriatic Sea.

Final PSTM data has now been delivered and all processed data will be available by the end of April. The Government of Croatia opened its licensing round over the country's offshore continental shelf in Zagreb, Croatia, on the 2nd of April.

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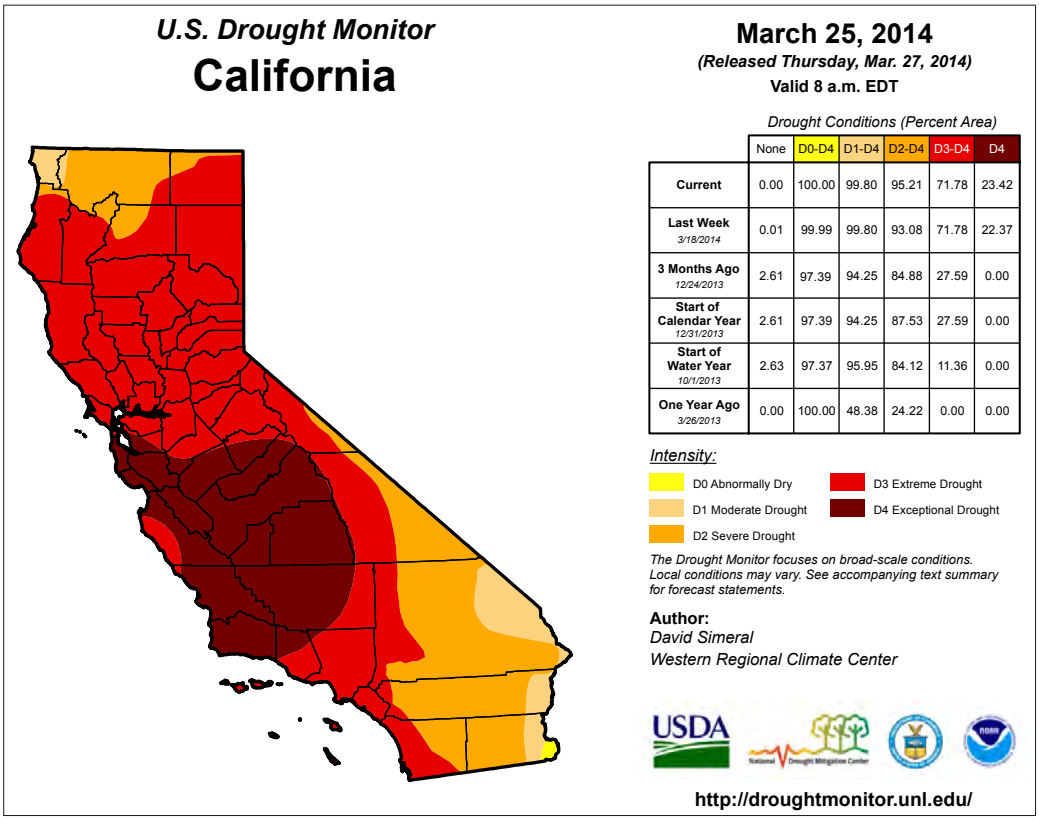


said Governor Brown. "I've declared this emergency and I'm calling all Californians to conserve water in every way possible."

Later the Governor remarked, "Every day this drought goes on we are going to have to tighten the screws on what people are doing." The state's growing predicament became glaring on January 31, 2014 when state officials announced that for the first time in its 54-year history, no water, none, would be released from a huge system of reservoirs to local agencies.

As of March 18, 2014, the California Department of Water Resources measured the statewide water content of the snowpack at only 26% of the average historical April 1st volume. This measurement is crucial because the end of March is when the snowpack is normally at its greatest extent and begins to melt, feeding streams and reservoirs. Snowpack is the source of about one-third of all the water used by California's cities and farms. "We are on track for having the worst drought in 500 years," said B. Lynn Ingram, a professor of earth and planetary sciences at the University of California, Berkeley.

Kate Galbraith, in a March 2014 column titled "*America's Axis of Drought*," on the news website the *Daily Beast*, noted some similarities between the two most populous states, California and Texas, during their driest years. Both are major agricultural states that do not regulate groundwater use at the state level. Both have published lists of mostly rural towns where the taps could run dry. And both experienced massive wildfires causing large amounts of property damage. But perhaps the biggest lesson from Texas is that severe droughts can drag on long past the time when the hills turn green.

California's San Joaquin Valley, or Central Valley, is an Eden where more than one quarter of the nation's fruits and vegetables are grown. Peaches, plums, grapes, lettuce, almonds, strawberries, and hundreds of other crops are produced in abundance using irrigation water. With water, this is the best agricultural land in the world. Irrigation water is distributed throughout the fertile valley by the Central Valley Project, a tangle of aqueducts, pumps, canals and dams, which is the largest government water development project in the United States.

However, rights to irrigation water are not equitably distributed. As described in a March 2014 column in the *New York Times* by Mark Bittman titled, "*Exploiting California's Drought*," many farmers have a water supply contract with one of hundreds of water districts, granted when the state's population was much smaller, water was plentiful, and environmental concerns ignored. These contracts boosted the economy at great cost to the environment, and they are ludicrously unfair. Some farmers pay $7 per acre-foot, others pay $200; some have to buy water on the open market, and cities generally pay over $1,000. Newer state regulations mandate the measurement of actual water use and a pricing system that is based in part on the amount of water used.

From The Editor *continued on page16*

From the Editor continued from page 15

"The regs don't say that you have to use less water, but that you have to use it more efficiently," said Doug Obegi, a staff attorney at the Natural Resources Defense Council.

As the tenacious drought worsens, many farmers are receiving none of their federal water allocation. Some are pulling out their trees or crops or not bothering to plant at all. This year, about one-half million of California's eight million acres of agricultural land will not be planted. While it is too early to tell how much the drought may push up household grocery bills, many economists forecast that consumers can expect to pay more for food later this year.

"I have experienced a really long career in this area, and my worry meter has never been this high," said Tim Quinn, executive director of the Association of California Water Agencies in a *New York Times* article titled, "*Severe Drought Has U.S. West Fearing Worst*," by Adam Nagourney and Ian Lovett. "We are talking historical drought conditions, no supplies of water in many parts of the state. My industry's job is to try to make sure that these kind of things never happen. And they are happening."

Business Challenges

It is not just farmers and cities that worry about reliable water supplies. Unreliable water supplies can also have a devastating effect on business development. Over 75 percent of the world's biggest companies see water risks as critical, but most of these companies lack long-term water strategies, a KPMG sustainability report concluded. In a July 2013 article titled, "*As drought spreads, firms could be up the creek*," on the business news website *CNBC*, Constance Gustke wrote that corporations with a global footprint are scrambling to address their water risk because shortages can quickly short-circuit business in developing regions. Water reliability is increasingly seen as a competitive edge. In the future, businesses will need to factor water availability—and quality—when searching for new manufacturing sites or face possible deficits. Worldwide, shortages will be dire in coming years. By 2030, there will be a 40 percent global shortfall between water demand and water supply, according to the World Economic Forum.

"Companies across the spectrum are facing water challenges. Water is becoming the silent currency," said Giulio Boccaletti, managing director of global fresh water at Nature Conservancy.

What Then Shall We Do?

Indeed, what then shall we do? If drought turns out to be an ongoing condition in the American West, the "new normal," and cities, business, and agriculture need a reliable and growing supply of water to prosper, what's to be done? Some legislators think that praying for rain is the proper way to address the crisis. When faced with a crippling water shortage, praying is certainly understandable, but it is not really a good long-term strategy.

The Los Angeles Department of Water and Power (LADWP) drills exploration wells for groundwater resources in the San Fernando Valley in 2013. These wells are being used to characterize the basin's groundwater quality. The Groundwater System Improvement Study (GSIS) will ultimately result in projects to remove contamination from the groundwater allowing the LADWP to reduce the city's reliance on imported water providing Los Angeles with a more stable and reliable source of water. Photograph by Michael F. Forlenza, P.G.

One developing water management strategy that many cities are studying is aquifer storage and recovery (ASR). Implementing this strategy involves storing water during times of surplus in aquifers to be recovered during periods of deficit. The benefits of underground water storage versus surface water storage are multiple: large dams and other engineered structures are not needed, extensive land acquisition is avoided, and loss of ecological habitats due to flooding is prevented leading to overall lower costs versus a surface reservoir. "It just makes so much more sense," said Jim Lester, president of the Houston Advanced Research Center, a nonprofit research group. Additionally, water does not evaporate from storage when held in an aquifer. Evaporation can be serious problem in arid regions. Some reservoirs in western Texas lose more water each year into the air than is used by people. After geological studies identify a suitable aquifer with the proper characteristics of porosity, permeability, and geometry, surface water is injected by wells into the formation for storage and later retrieval. In some cases, such in El Paso, treated wastewater can be stored for later use. Aquifers used for ASR ideally have a moderate level of salinity allowing the fresher stored water to rest atop the displaced saline water and be readily accessible.

ASR projects may face legal challenges. Utilities injecting water into an aquifer will want to ensure that the water is legally theirs to recover. In Texas, the "rule of capture" law means that anyone has a right to recover water under that person's land. So even if a

utility injected the water, in theory it could belong to someone else when it is withdrawn form a supply well.

Conservation is a strategy that can be implemented by any community to slow the growth of water demand. Conservation measures involving reduction of water losses during transmission and distribution, use of more efficient household appliances, and use of drought tolerant native plantings to reduce landscaping irrigation produce immediate benefits. Other near-term measures can be a switch to more efficient agricultural irrigation methods such as drip irrigation or developing strategic water pricing to more closely reflect the true value of the resource. Price is a very powerful motivator. When something costs more, people use less.

Longer-term strategies may employ evolving technologies like desalination of brackish groundwater, reuse of wastewater, or expanding the use of renewable energies such as solar which uses far less water per kilowatt generated than conventional power generation. All of these elements should be considered during long-term water planning to manage and diversify water sources.

But as drought grinds on across the American West, the time to act has come. As the old adage says, "Don't wait until it is raining to fix the roof." On second thought, if it is raining, go out and enjoy the blessing. ■

> "Isn't the rain fine?"
> Ernest Hemingway
> *A Farewell to Arms*

HGS Guest Night

June 7, 2014

Houston Museum of Natural Science

Speaker: Pasquale Scaturro

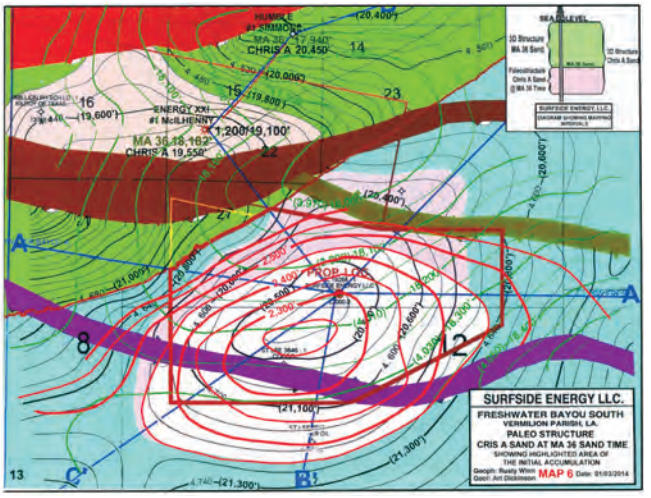
"My Adventures Down the Blue Nile"

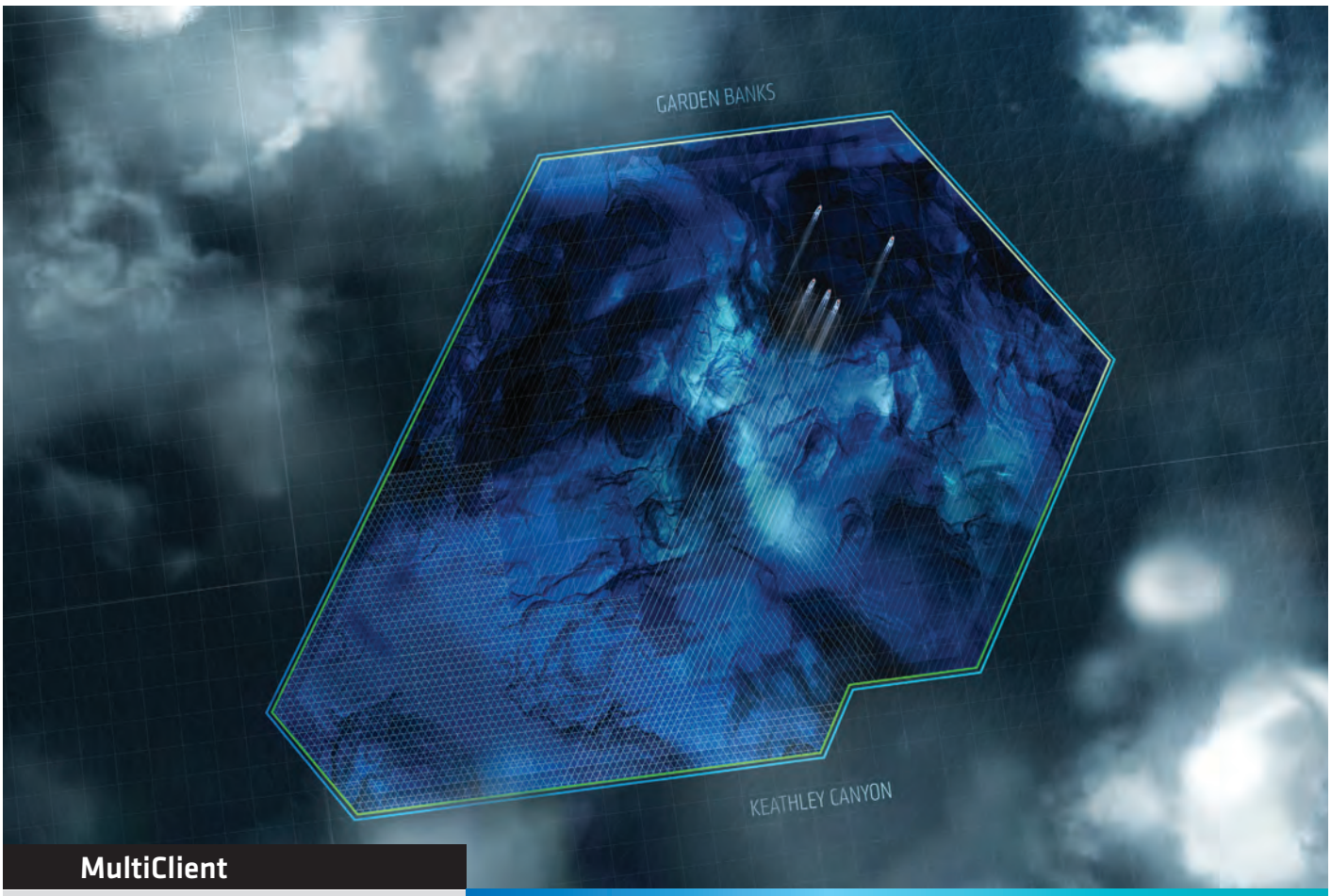
Movie: Mystery of the Nile

Correction

An incorrect map was placed as Map 6 in the article titled "Fundamental Principles of Hydrocarbon Formation, Migration and Accumulation" by Arthur Dickinson in the April 2014 *Bulletin* on page 57. The correct Map 6 is presented to the right:

Map 6 is the Paleo Structure of the Cris A Sand at MA 36 Sand time showing the highlighted area of the initial accumulation.





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Dinner 6:30–7:30 p.m.

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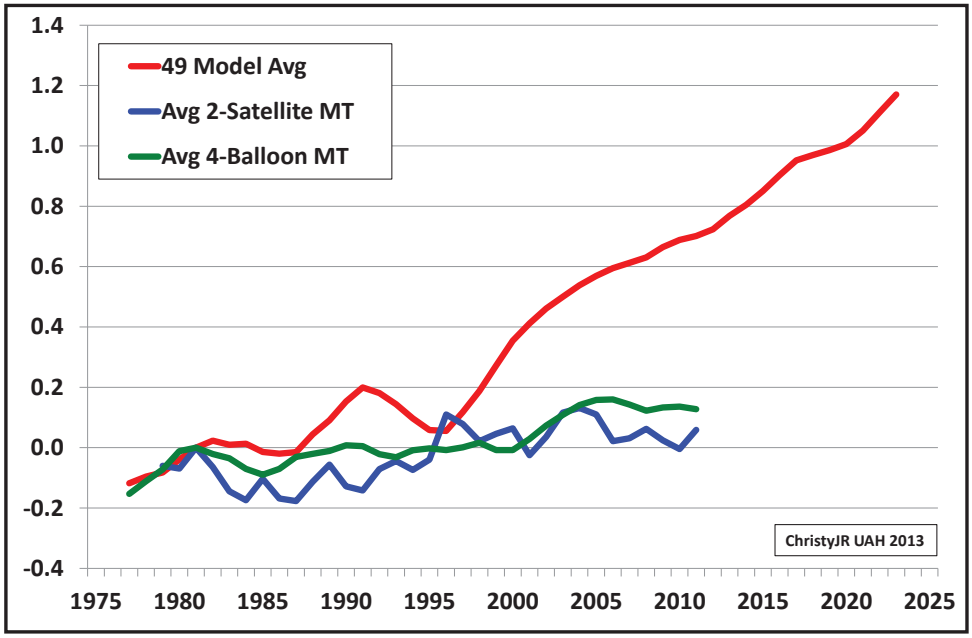
To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

W.C. Rusty Riese
Adjunct Professor
Rice University
rustyriese@gmail.com

Climate Change: Facts and Fictions

The past several years have seen several opinion pieces regarding climate change appear in the pages of many publications, both scientific and popular. Although both sides of this now almost religious debate were represented, few, if any, real facts or data are provided to support the opinions expressed. The public deserves more, and specifically deserves to be properly informed.



IPCC CMIP-5 models vs observations, mid-tropospheric temperature; base 1979-83, five-year running mean. Courtesy of John Christy, UAH, personal communication.

The heat content of the atmosphere has remained largely unchanged since 1995. Data prepared and compiled by a number of climate scientists illustrate the wide divergence of climate model projections from what has been occurring: the climate has not been warming any more than would be expected as the world continues to move out of the Little Ice Age. These data have been accepted by the Intergovernmental Panel on Climate Change (IPCC), whose chair admits that the climate modeling community does not understand what is happening.

Water vapor in the atmosphere is a more potent greenhouse gas than CO_2. Climatologists have understood this for decades and this is a fact clearly expressed in all climatology textbooks. None of the climate models employed today adequately address the influence of water vapor.

Cosmic radiation is the source of the particles which cause nucleation of water droplets and cloud formation in the upper atmosphere. Its flux, in turn, is directly influenced by solar activity and the strength of the resulting solar wind. None of the climate models deal with either of these first-order climate influences.

The Earth's atmosphere has had far higher CO_2 concentrations many times and for much of the geologic past, and major glacial events have occurred during those times, most notably during the Carboniferous and Silurian. The inescapable conclusion is that CO_2 has no relationship to the temperature of the Earth's atmosphere. This is a conclusion that was reached by many scientists who have looked at ice core data and found that increases in CO_2 concentrations in the atmosphere occur several hundred years after temperatures have risen – they do not change in lock-step as has been claimed, and an event 800 years in the future cannot impact events today.

These facts allow a number of fictions to be addressed:

- Polar bears will not become extinct if sea ice diminishes. Polar bears were around before the Medieval Warm Period and came through it just fine. And a recently published, peer-review study of the Davis Straights in Canada found that not only had the polar bear population increased dramatically since the 1970s, but that the area may have reached its carrying capacity. Good news for polar bears.

- The evolution which the climate is exhibiting, and which it constantly exhibits,

HGS General Dinner *continued on page 21*

Career Opportunity

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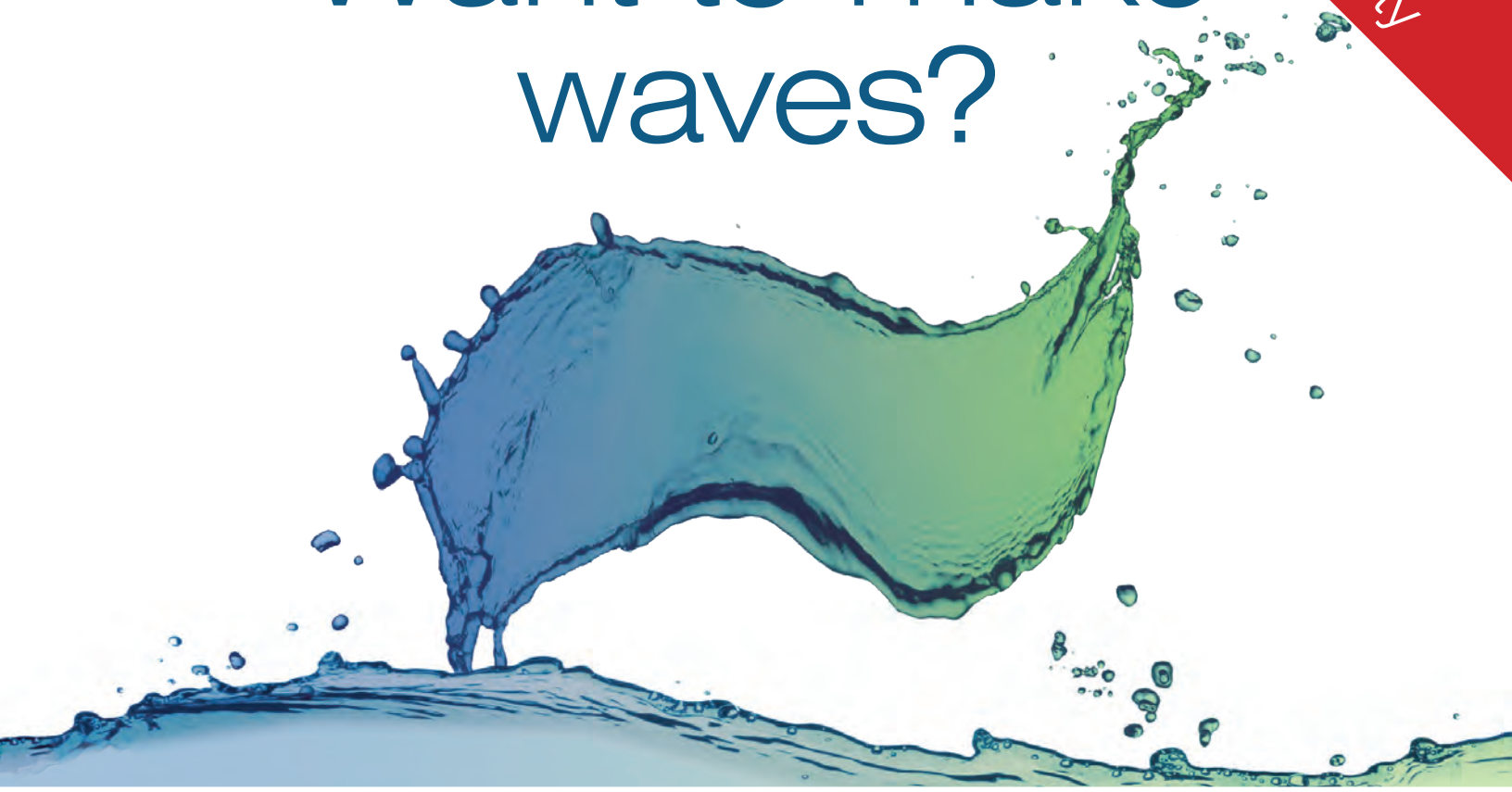

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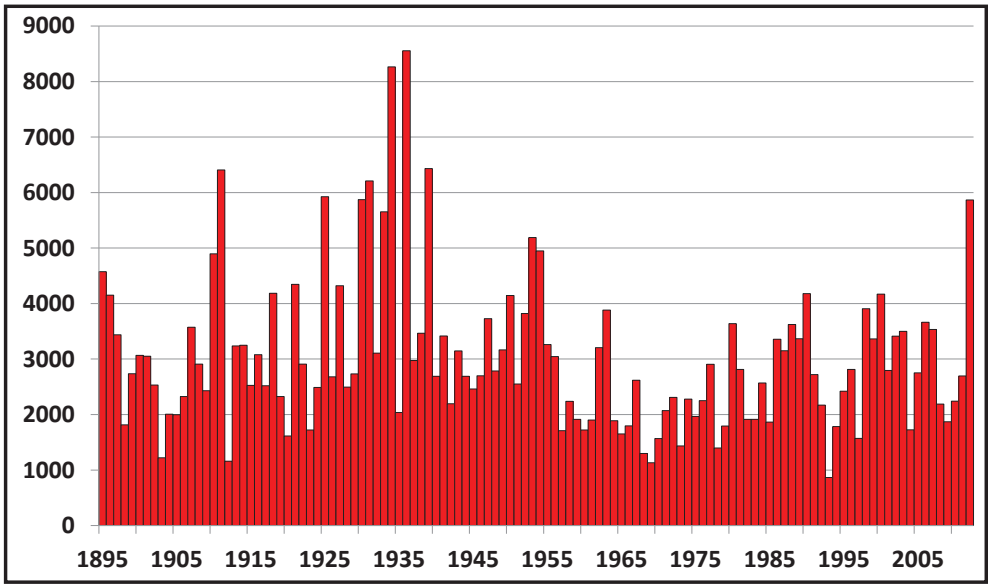
 continued from page 19

is not causing an increase in violent storms including the frequency of violent tornados (greater than F3).

- The changes in climate during the past 100 years have not caused either an increase in flooding or an increase in the number or extent of droughts.

- The number of daily record high temperatures is not at an all-time high. For the past 100 years that was reached in the 1930s during the period of the Dust Bowl.



Number of daily high temperature records by year, 974 USHCN stations with >80 years data, 1895-2012 (Records standing as of December 31, 2012). Figure courtesy John Christy, UAH personal communication.

- Finally, there is not a consensus among scientists that anthropogenic CO_2 is causing climate change. The widely quoted number of 97% of scientists believing in global warming is based on an on-line survey of 10,257 earth scientists. 3,146 replied and all but 77 were "disqualified" by the researchers conducting the survey. Of those, 75 thought that humans were contributing to climate change, thus the 97% number; one that is not particularly robust.

Four conclusions can be drawn from examination of these data:

1. All of the scary global warming scenarios are based on computer models.
2. None of the models work.
3. There is and has been no scientific consensus.
4. The data which come from our global experiment, the observations we have made, indicate that the climate is evolving and always has evolved continuously, and people have had nothing to do with that change. We need to use this information to stop our regulators and legislators from taking steps and passing laws which will have no effect on the climate we enjoy and can only have disastrous impacts on our economy. ■

Biographical Sketch

Dr. W.C. Rusty Riese is a geoscientist based in Houston, Texas. He is widely experienced — having worked in both minerals and petroleum as a geologist, geochemist, and manager during more than 40 years in industry. He participated in the National Petroleum Council evaluation of natural gas supply and demand for North America which was conducted at the request of the Secretary of Energy, in the more recent analysis of global supply and demand requested by the same agency, and in the National Research Council analysis of coal bed produced waters and their management in the western United States. He is currently a member of the Committee on Resource Evaluations of the American Association of Petroleum Geologists, a member of the House of Delegates, and past Sections Vice President.

Dr. Riese has written extensively and lectured on various topics in economic geology, including biogeochemistry, isotope geochemistry, uranium ore deposits, sequence stratigraphy, and coal bed methane petroleum systems. He holds numerous domestic and international patents. He has more than thirty years of teaching experience, including twenty-eight years at Rice University where he developed the curricula in petroleum geology and industry risk and economic evaluation, as well as several other courses. He is currently an Adjunct Professor at Rice University and the University of New Mexico. He is a fellow in the Geological Society of America and the Society of Economic Geologists, and a member of the American Association of Petroleum Geologists, and several other professional organizations.

He earned his PhD from the University of New Mexico in 1980, his M.S. in geology from the same university in 1977, and his B.S. in geology from the New Mexico Institute of Mining and Technology in 1973. He is a Certified Professional Geologist, a Certified Petroleum Geologist, and a Licensed and Registered Geologist in the states of Texas and South Carolina, respectively.

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5:25PM

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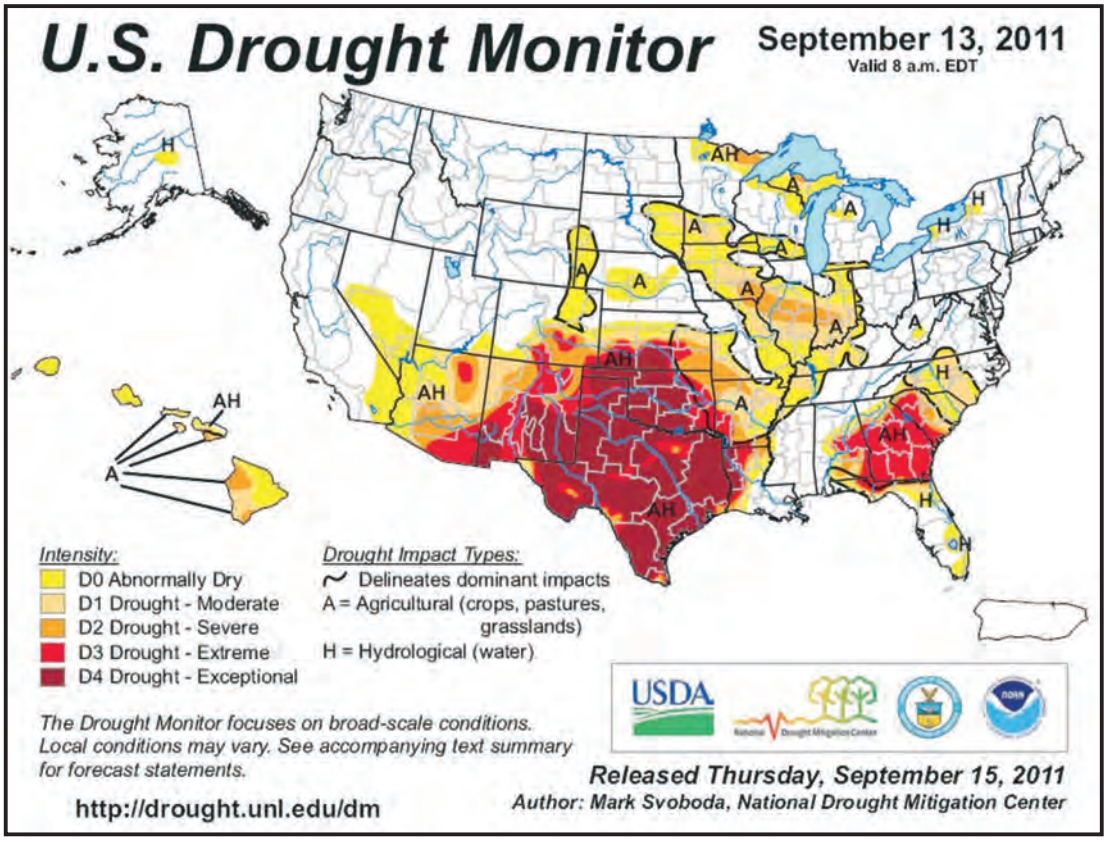
Walk-ups may pay at the door if extra seats are available.

Doug Hall
Owner, W D Hall Company
Austin, TX

Recycling Oil Field Produced Water to Increase Local Water Supplies

Oil companies pay to have water produced with oil and gas separated, stored, transported, and injected for enhanced oil recovery (EOR) or to be disposed in non-productive zones. Called "produced water," the overall cost for disposal can be high. Depending on local conditions, the disposal and transportation costs alone may range from $3/bbl to around $10/bbl. Some produced water is treated and reused on site. Most operators consider produced water an expensive, irritating waste product.



So why not recycle and reuse this "new" water? Without hydrocarbon development, this water would never be an available option for supplementing local water supplies. Often produced from great depths, this water can have very high dissolved solids concentrations when it is brought to the surface as a by-product.

Produced water should be considered for reuse, not just as water for drilling and hydraulic fracturing operations, but also to supplement local industrial and agricultural water supplies. Competition for available surface and groundwater has increased. Individuals and businesses are beginning to pay more for the water they use each day. Not only is the price of water rising but there is also growth-related political support for increasing our water supplies in Texas. This scenario seems favorable for taking a serious look at investing in the recycling and expanded reuse of produced water.

From the large number of salt water disposal wells in Texas, we know that the volume of produced water is considerable. Based on a favorable price for oil and gas and recent drilling projections, it appears that the quantity of produced water will continue to grow in Texas for at least 10 to 15 years, and probably much longer. In some areas, the volumes are large enough to make a positive impact on local water usage. In addition, a variety of effective treatment technologies currently exist.

The challenge is to determine how to obtain, store, treat, and distribute this **Environmental & Engineering Dinner** *continued on page 25*

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SYSTEMS ACQUISITION LICENSING PROCESSING IMAGING

HGS Environmental & Engineering Dinner continued from page 23

water in a manner that allows the recycling facility to be profitable. Location of the facility is key. Proximity both to reliable sources and to end users is critical. One additional consideration may be the need to have a reliable supply of brackish groundwater. Reuse regulations will also be important.

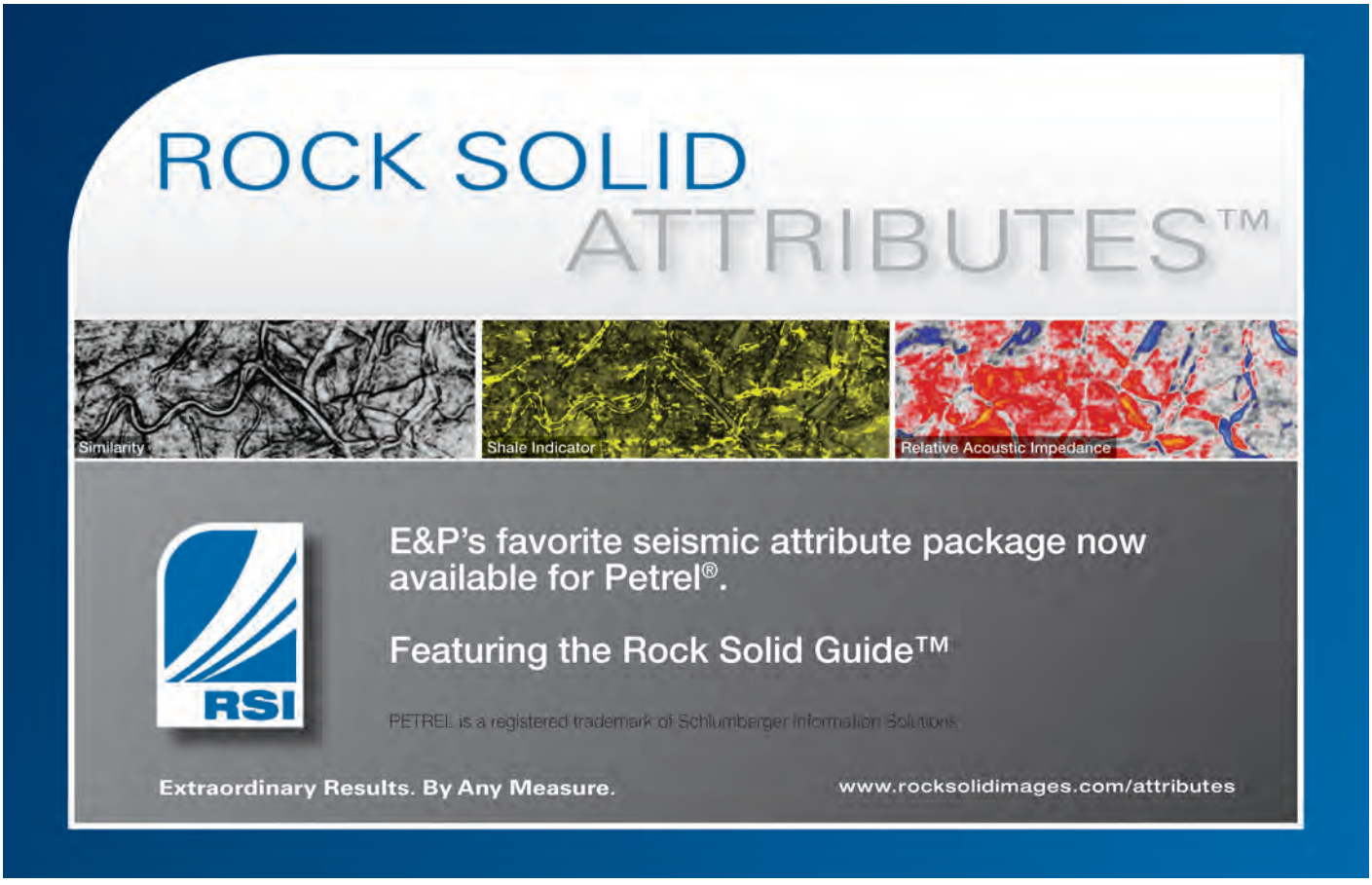
This presentation focuses on a discussion of produced water volumes in Texas, the economics of produced water treatment, blending, and recycling; and a vision of what a stationary, commercial recycling facility might look like. ■

Biographical Sketch

Since 1998, when **Doug Hall** started the W D Hall Company, he has been working with owners and CEOs of technical service firms that are growing or that need to grow. This work is described as "business therapy." For eleven years before that, he was the owner of the Hall Southwest Corporation, a water resource, environmental, and engineering consulting firm with offices in Austin, Dallas, and Midland, Texas. His firm provided a broad range of field services and regulatory support to large industrial, commercial and municipal clients.

In 2010, he added Clean Water Strategies (CWS) to the W D Hall Company portfolio. The mission of CWS is to "stretch out" clean water supplies in Texas. Examples of water resource challenges include: treatment and reuse of produced water from E&P operations; development and treatment of brackish groundwater supplies, reuse of excess mine water, and the minimization of "water lost" from municipal distribution systems.

Mr. Hall is experienced in working with Texas agencies (state, regional and local) that impact the management and regulation of water resources. He has been in the consulting business most of the time since he graduated from the University of Texas with a master's degree in geosciences in 1974. His positions and responsibilities have included: staff hydrogeologist, project manager, field services manager, senior hydrogeologist / operations manager, research scientist, corporate marketing manager, technology commercialization manager, entrepreneur, business owner, and independent business consultant. For a few years in the mid 90s, he had a vineyard near Fredericksburg, Texas. That career ended when goats ate the grapes!



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Dinner 6:30–7:30 p.m.

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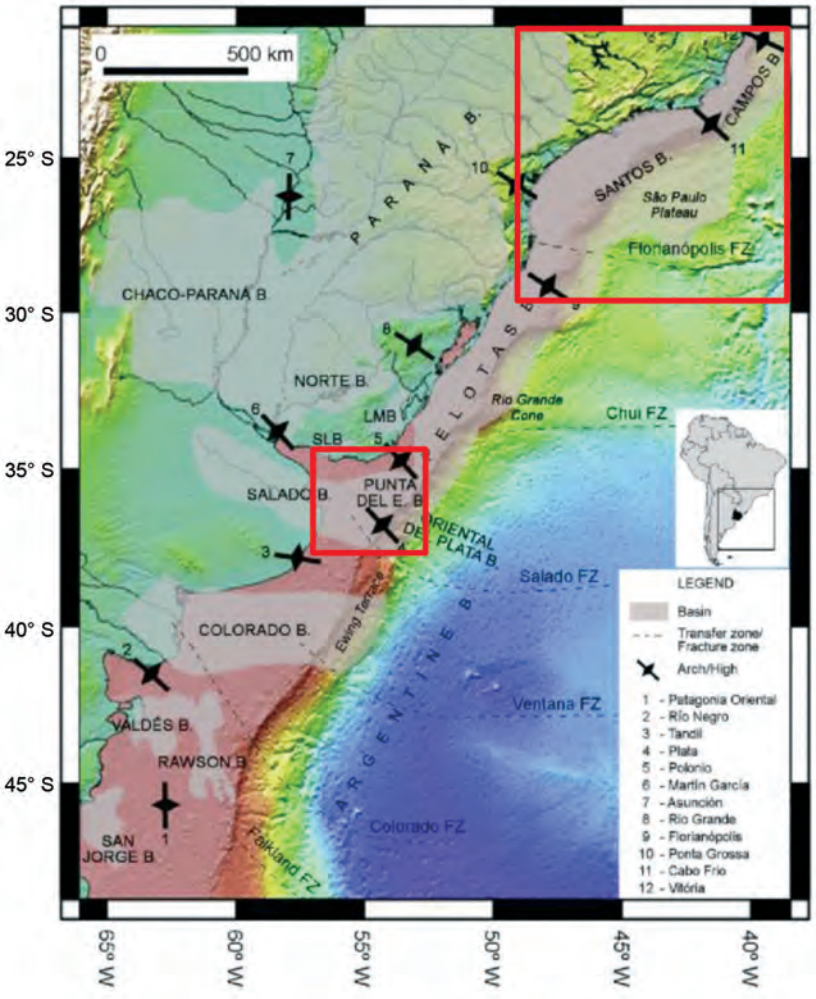
Walk-ups may pay at the door if extra seats are available.

Oscar López-Gamundí, Ph.D.
P1C Consultants
Houston, Texas
orlg2003@yahoo.com

Influence of Asymmetric Half-Grabens on the Overlying Sag Traps of the South Atlantic, offshore Brazil and Uruguay

The initial phase of the diachronous opening of the South Atlantic is characterized by Jurassic to Cretaceous synrift deposits confined to half-grabens. These were followed by more areally extensive, early post-rift (sag) sedimentation. Along both the South American and African margins of the South Atlantic, these rift and sag phases were followed by the deposition of a thick salt section, which is observed southward to the Pelotas and Walvis ridges. Hydrocarbon plays in this region are of two broad and distinct types: pre-salt plays and post-salt plays.



Recent exploratory efforts in the South Atlantic have been focused on offshore Brazil, particularly in the pre-salt, post-rift transitional (sag) section of the Santos, Campos and Espirito Santo basins. The underlying asymmetric half-graben configuration of the synrift section, with a clearly defined border fault margin and a ramp margin, is absent south of the Santos basin in the Pelotas basin. This configuration of elements can be identified again farther south in the Punta del Este basin offshore Uruguay and farther south offshore Argentina. Newly acquired seismic reflection data, particularly those processed using prestack depth migration (PSDM), in the offshore of Brazil and Uruguay, unveiled some details of the structural framework of these individual half grabens and their influence on the trap formation of the pre-salt structures.

Fault-plane reflections indicate the predominance of planar fault-plane geometries. This is consistent with the absence of rollover anticlines or hanging-wall antiforms, which are a direct function of nonplanar listric faults, also with neotectonic observations that indicate that most normal faults in continental tilted rifts are almost planar with dips between 30° and 60°.

Differential compaction due to the contrasting nature of rift fills and adjacent basement highs is the main control of the four-way traps in the pre-salt discoveries of the Santos and Campos basins. These rifts show variable landward or basin-ward polarity, but in some cases there is a dominant landward (westward) vergence, opposite to the present deepening **HGS International Dinner** *continued on page 29*

HGS–PESGB

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In twelve years this conference has become established as a leading technical E&P forum on Africa, with attendance that can exceed 400. Participants include operators, service companies, consultants, governments and academia. The two day program of talks, technical posters and vendors' exhibits will be held on September 9-10, 2014 in Houston, Texas.

The conference, which alternates annually between London and Houston, is organized by the Houston Geological Society (HGS) and Petroleum Exploration Society of Great Britain (PESGB). The HGS-PESGB African Conference covers all aspects of African E&P, with particular emphasis on new ideas for plays and prospects, the geology of the continent and its conjugate margins, and application of emerging technologies.

Abstracts (~200 words) should be submitted as soon as possible to the technical committee, Africa2014@hgs.org.

Currently, volunteers are being sought to be proactive Session Chairs and anyone interested should contact the Technical Committee as soon as possible.

Details of sponsorship opportunities and display booths are available from the HGS office. To become a sponsor or inquire about exhibit space, contact sandra@hgs.org

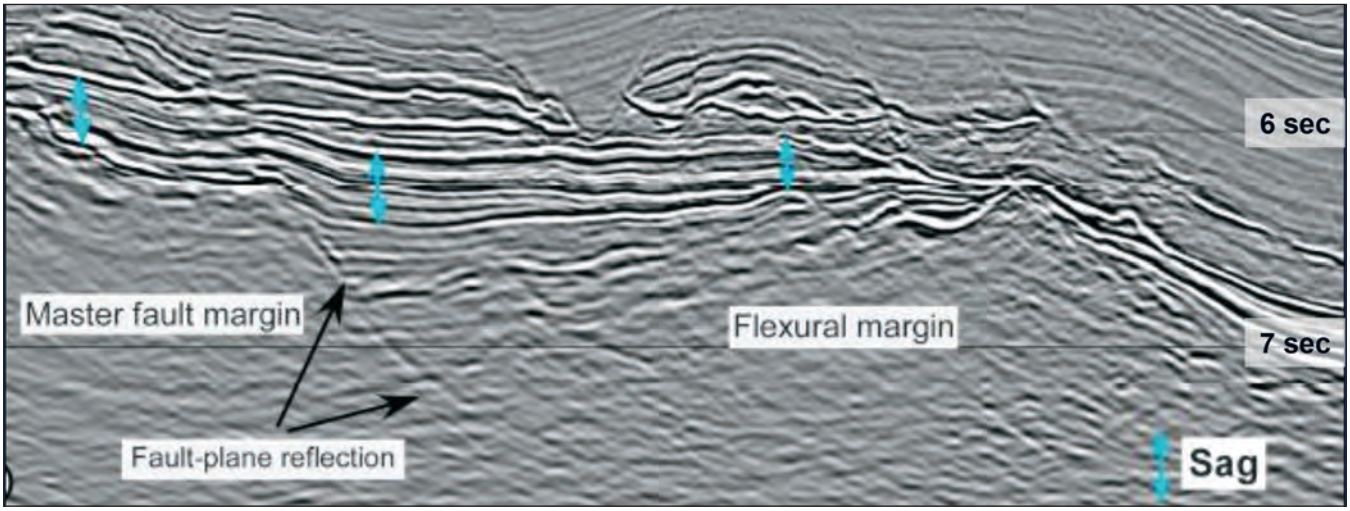
Registration will be available from April 2014 and Early Bird benefits will apply for a few weeks.

Further details will appear in the HGS and PESGB bulletins and on their websites, www.hgs.org and www.pesgb.org.uk.

Conference Committee for 2014

Martin Cassidy (chair), Al Danforth, Ian Poyntz, Donna Davis and Sandra Babcock (HGS)
Ray Bate and Duncan Macgregor (PESGB).

HGS International Dinner continued from page 27



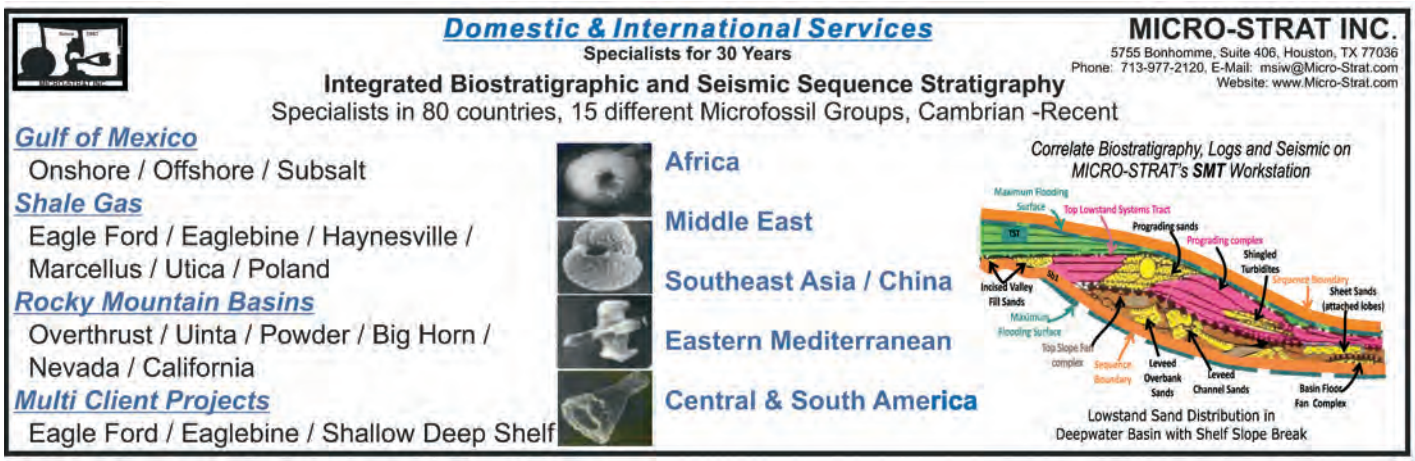
of the continental margin. In this latter case, differential compaction at the half-graben border fault margin has been a critical factor in accentuating and/or creating counter-regional dips necessary to form four-way structural closures at the sag level.

Seismic evidence of differential compaction is provided by the presence of hanging wall compaction synclines over basement footwall cutoff points. The synclines are characterized by approximately vertical fold axes immediately above the hanging-wall cutoff of the basement. In poorly imaged areas, the termination of the divergent seismic configuration of the synrift strata can be used to place the master fault of the half-graben. Trap integrity of the four-way closures is then enhanced in asymmetric half-grabens with landward dipping master border faults. Conversely, half-grabens with basin-ward vergence, defined by basin-ward dipping master border faults and landward dipping ramp margins, create gently dipping counter regional dips and therefore contribute to the formation of riskier four-way traps. ■

Biographical Sketch

Oscar López-Gamundí is currently an independent consultant based in Houston. He has over 30 years of experience in international oil and gas exploration as a consultant (1982-1989), in different technical and managerial positions in Texaco and Chevron (1989-2006), Hess (2006-2012), and C&C Energy (2012). He received his undergraduate degree and graduate (Ph.D.) degree from the University of Buenos Aires, Argentina and conducted postdoctoral studies at the University of California at Santa Barbara.

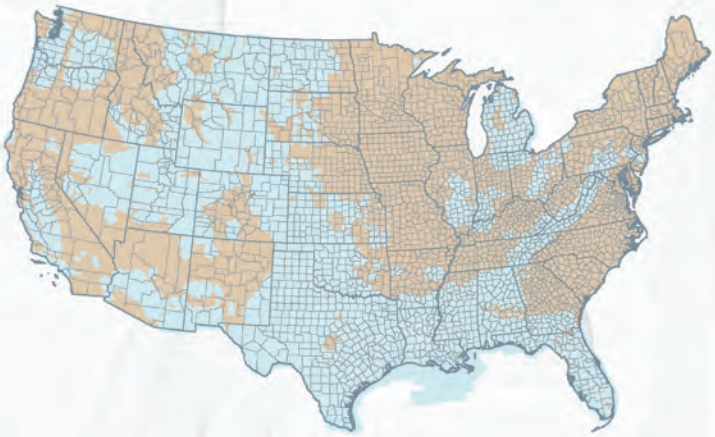
Dr. López-Gamundí has been a Research Associate at the Macquarie University in Australia and Professor of Sedimentology at the University of Buenos Aires. He is currently a Distinguished Lecturer for the AAPG – Latin America chapter and instructor for NExT (Schlumberger). He has published and presented papers covering sedimentology, basin analysis, and sequence stratigraphy. His principal research interests are: rift basins, outcrop and subsurface studies of clastic and carbonate depositional systems, and paleoclimatic evolution of Gondwanan basins.



getech

Onshore US gravity and magnetic data

Gravity Data Getech data (light blue), Public infill data (tan)

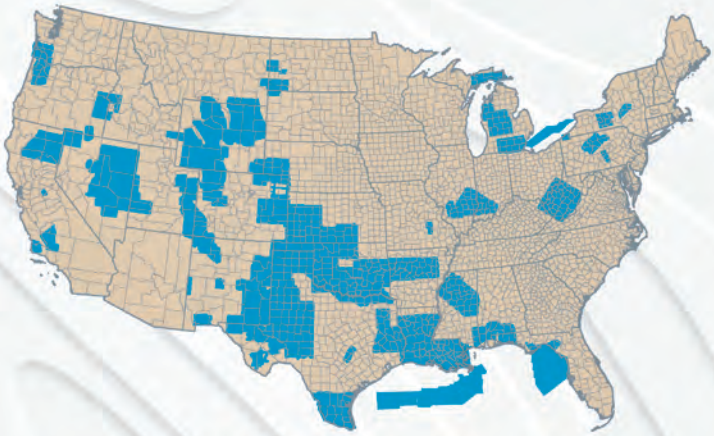


Cost effective evaluation of prospective targets

Identify new exploration opportunities

Add value to your prospects

Magnetic Data Getech data (dark blue), Reprocessed public data (tan)



Map structures and basement architecture

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Rocky Roden, *speaker (rodenr@wt.net) and* ***Mike Forres,*** *Consultants Rose & Associates*
Roger Holeywell, *Marathon Oil Company;* ***Matthew Carr,*** *QI Petrophysics;* ***P. A. Alexander,*** *Consultant*

The Role of AVO in Prospect Risk Assessment

All companies exploring for oil and gas should perform a risk analysis to understand the uncertainties in their interpretations and to properly place the prospects in value order in the company's drilling portfolio. For conventional exploration in clastic environments, primarily sands encased in shales, a key component of the risk analysis process is evaluating direct hydrocarbon indicators which can have a significant impact on the final risk value. This talk investigates the role that amplitude-versus-offset (AVO) plays in the risk assessment process as a portion of a comprehensive and systematic Direct Hydrocarbon Indicator (DHI) evaluation. Documentation of the geologic context and quantification of data quality and DHI characteristics, including AVO characteristics, are necessary to assess a prospect's risk properly.

A DHI consortium database of over 230 drilled prospects provides statistics to determine the importance of data quality elements, primarily in Class 2 and 3 geologic settings. The most important AVO interpretation characteristics are also identified based on statistical results and correlated with well success rates. A significant conclusion is the relevance of AVO in risk analysis when it is the dominant component in the DHI portion of the risk. Critical in the risk assessment process is understanding the role AVO and DHI analysis play when prospects approach Class 1 geologic settings. The effect that hydrocarbons have on the seismic response is significantly diminished in this setting versus the other AVO classes. All of these observations confirm the necessity of properly evaluating a prospect's geological setting and of implementing a consistent and systematic risk analysis process, including appropriate DHI and AVO components. ■

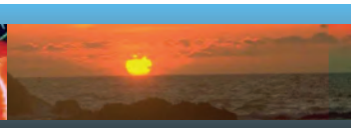
For conventional exploration in clastic environments, primarily sands encased in shales, a key component of the risk analysis process is evaluating direct hydrocarbon indicators which can have a significant impact on the final risk value.

Biographical Sketch

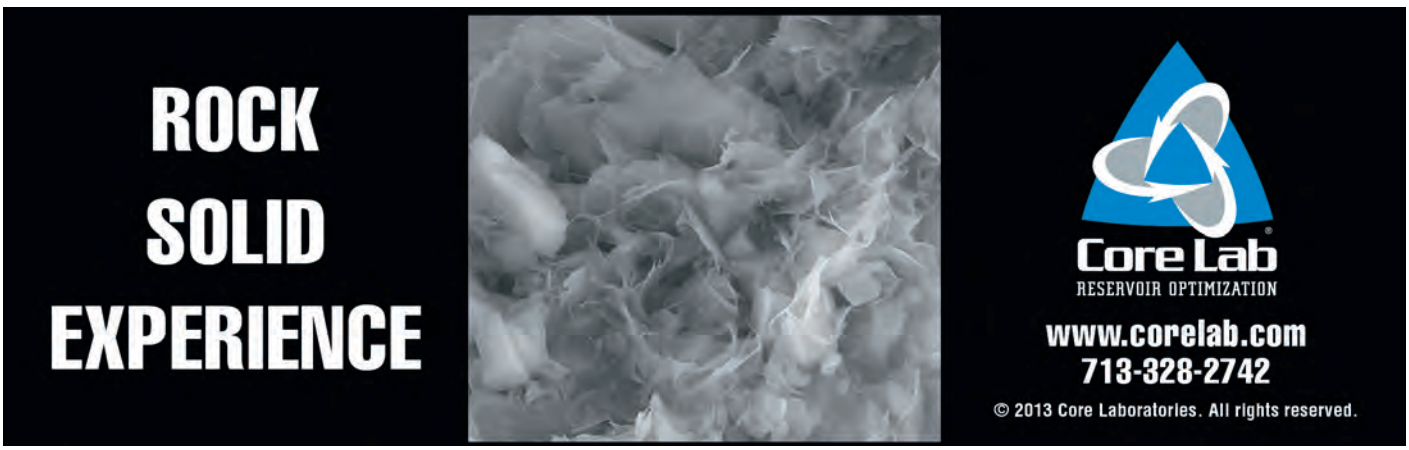
Rocky Roden has owned his own consulting company, Rocky Ridge Resources, Inc., for the last ten years and works with numerous oil companies around the world on interpretation technical issues, prospect generation, risk analysis evaluations, and reserve/resource calculations. He is a principal in the Rose and Associates DHI Risk Analysis Consortium which has involved over 50 oil companies since 2001, in developing a seismic amplitude risk analysis program and worldwide prospect database. He has also worked with Seismic Microtechnology, Geophysical Insights, and Rock Solid Images on the integration of advanced geophysical technology in software applications. He is a proven oil finder with 39 years in the industry and extensive knowledge of modern geoscience technical approaches. Mr. Roden is also the past Chairman of The Leading Edge editorial board.

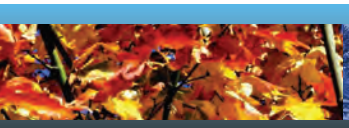
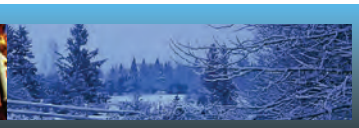
As Chief Geophysicist and Director of Applied Technology for Repsol-YPF (from which he retired 2001) his role comprised advising corporate officers, geoscientists, and managers on interpretation, strategy and technical analysis for exploration and development in offices in the United States, Argentina, Spain, Egypt, Bolivia, Ecuador, Peru, Brazil, Venezuela, Malaysia, and Indonesia. Mr. Roden 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 an MS in geological and geophysical oceanography from Texas A&M University.

May 2014



Sunday	Monday	Tuesday	Wednesday
	Reservations: The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event.** If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**		**Members Pre-registered Prices:** General Dinner Meeting..... $30 Nonmembers & walk-ups..... $35 Env. & Eng. ..... $30 Luncheon Meeting ..... $30 Nonmembers & walk-ups ..... $35 International Explorationists ..... $30 North American Explorationists $30
4	**5**	**6** **HGS Board Meeting** *6 p.m.*	**7**
11	**12** **HGS General Dinner Meeting** *"Climate Change: Facts and Fictions," W.C. Rusty Riese* *Page 19*	**13**	**14** **HGS Environmental & Engineering Dinner Meeting** *"Recycling Oil Field Produced Water to Increase Local Water Supplies," Doug Hall* *Page 23*
18	**19** **HGS International Dinner Meeting** *"Influence of Asymmetric Half-Grabens on the Overlying Sag Traps of the South Atlantic, Offshore Brazil and Uruguay," Oscar López-Gamundí* *Page 27*	**20** **HPAC** *Spring Style Show and Business Meeting Luncheon Houston Racquet Club* *Page 66*	**21**
25	**26**	**27**	**28** **HGS General Luncheon Meeting** *"The Role of AVO in Prospect Risk Assessment," Rocky Roden* *Page 31*



GeoEvents

Thursday	Friday	Saturday
1	2	3
8	9	10
15	16	17
22	23	24
29	30	31

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May 4 – 7
NGWA Groundwater Summit 2014
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May 5-8, 2014
2014 Offshore Technology Conference
Houston, Texas

May 6 – 7
TCEQ Environmental Trade Fair and Conference
Austin Convention Center, Austin, Texas

May 12-16, 2013
GeoConvention 2014: Focus Calgary
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June 7
HGS Guest Night
Houston Museum of Natural Science

June 9-14
Society of Independent Professional Earth Scientists (SIPES) Annual Meeting
New Orleans, LA

June 15-23
HGS Grand Canyon Field Trip

June 28
Annual HGS Skeet Shoot

June 30-July 4
30th International Society for Environmental Geochemistry and Health Meeting
Newcastle-upon-Tyne, UK

August 20-22
Summer NAPE Expo
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September 9 – 10
13th PESGB / HGS Africa Conference 2014
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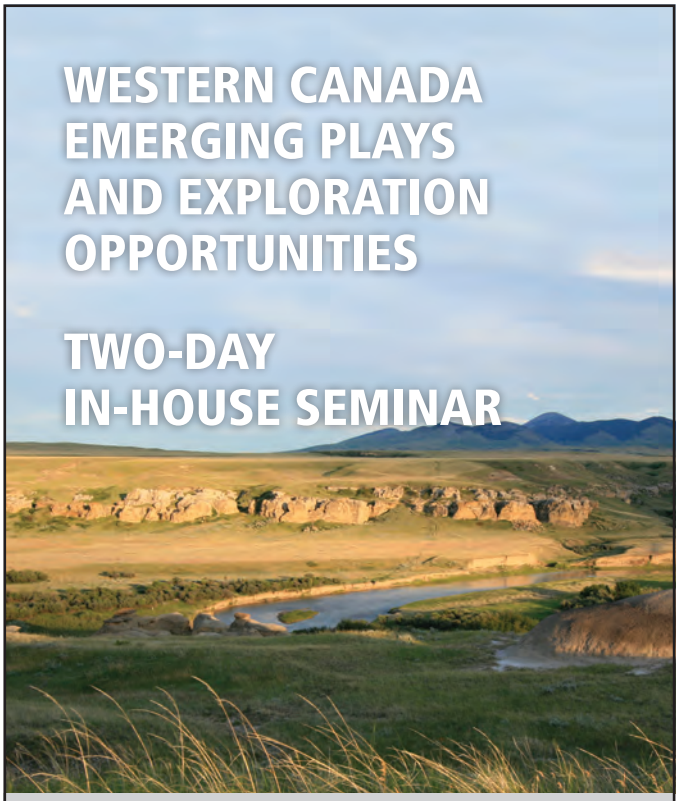

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Houston Rocks

by H.C. Clark and Martha Lou Broussard
hcclark@rice.edu

Two words not typically used together or even distantly related, at least in a geological sense: Houston Rocks. Our city exists in part because of geology and there are a whole lot of us geologists here, frustrated because we live on a ten mile thick stack of poorly-cemented sediments, mud at best, and nothing like a rock in, or even on, the ground. Oh, there are some outcrops of Beaumont sands along Buffalo Bayou as it goes through west Houston and Memorial Park, and more in White Oak Bayou at Woodland Park, but visits to these "rocks" are disappointing—and risky. Well, it turns out that there are lots of "rock outcrops" in Houston, and they are as close as a parking spot downtown, at the University of Houston, Rice University, and at many other places. Here one can see building stones from all over the world, and they are incredible. The older buildings are particularly interesting because they combine history, architecture, and an unabashed statement about whom and what they were about.

There is something more than color and texture about a rock, a history that gives a building visitor a feeling of connection and comfort that is not just for geologists.

People seemed to use building stone then in the way we use height today. Regardless of the creational motivation, Houston has lots of rocks: the Texas limestones of City Hall, the University of Houston Administration, and the San Jacinto Monument; or the complex

Houston Rocks *continued on page 37*

Niels Esperson Building

Sallyport column, Rice University

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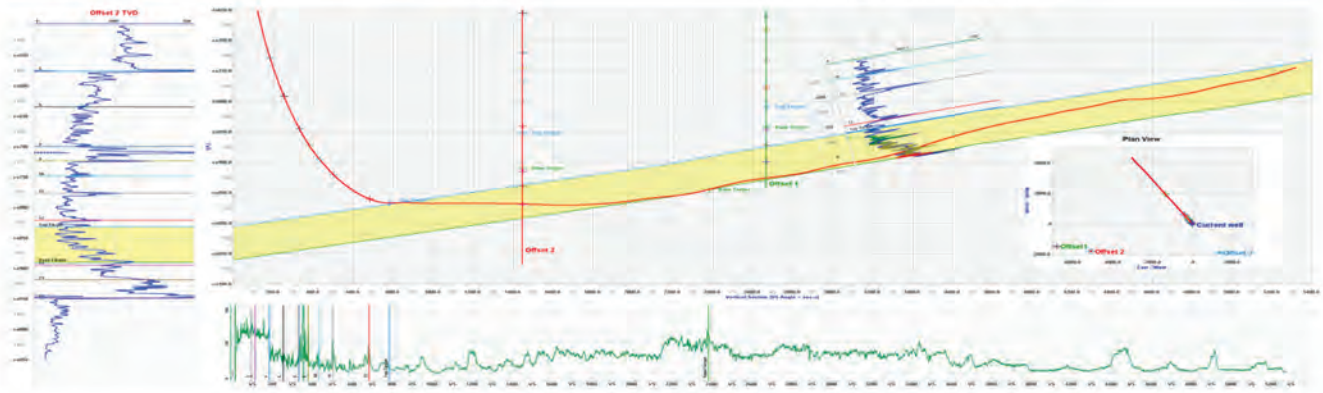

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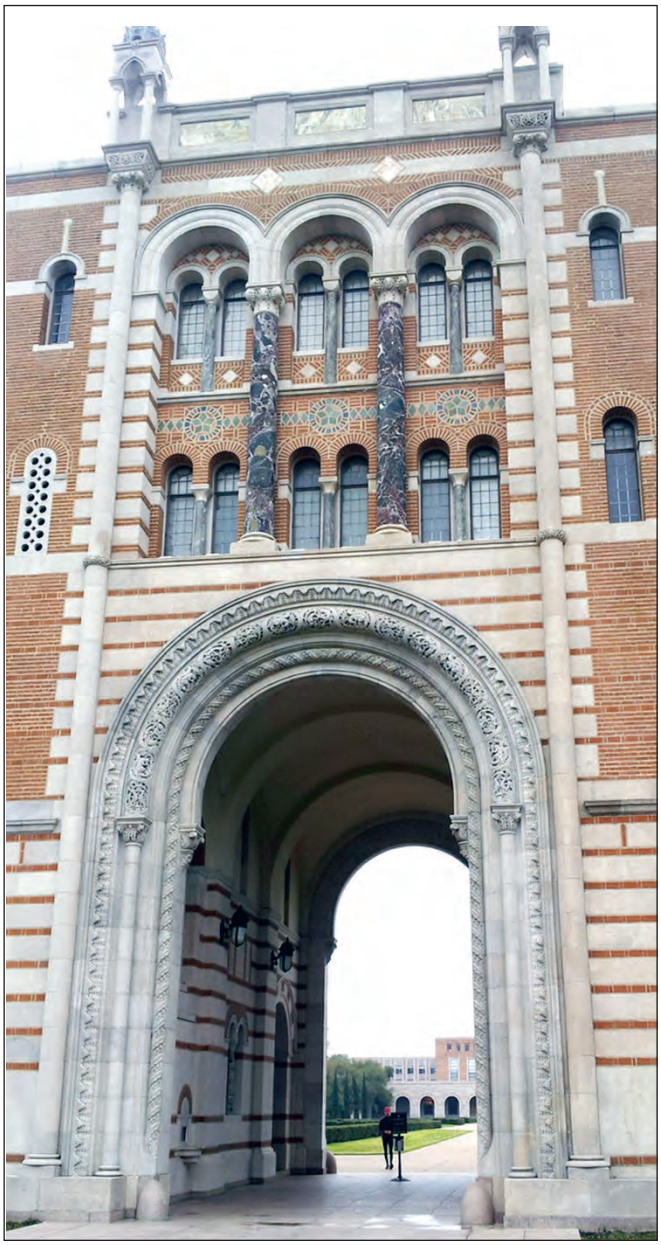
Houston Rocks continued from page 35

serpentinite slabs, marble, and travertine found everywhere; and granites from Central Texas and from Eurasia and Africa make up the base, exterior, and interior of many old and new Houston buildings.

There is something more than color and texture about a rock, a history that gives a building visitor a feeling of connection and comfort that is not just for geologists. The individual building stones we encounter are fascinating in themselves, but, as with all rock outcrops, geologists always want to know more - the building stone's provenance, a reference, where it fits in one part of geology or another. An answer to this dilemma was a field trip guide developed by a research committee of the HGS for the 1995 AAPG meeting, a long time ago even in a geological sense. Titled "Walking Tour of Downtown Houston Building Stones," the tour visited "outcrops" and learned about the histories of about a dozen downtown buildings. The tour ended with a reception at the Kellum-Noble home in Heritage Park — and the story of the brick made on that property. Brick is Houston's most used, though man-metamorphosed made, building stone.



Rice University Sallyport

Sallyport column detail

Here is a greatly abbreviated history of the two downtown Esperson buildings at Travis and Walker: the Niels Esperson Building was finished in 1927 (at the time the third tallest in the United States) and the Mellie Esperson Building finished in 1941. John and Drew Eberson were the architects. Both buildings were rooted in the geologic success of the day that came with being a founding partner of Humble. Mellie Esperson directed the construction of both buildings, finishing the Niels Esperson just before the Depression and hers as the first Houston tall building after the Depression. The Niels Esperson Building was a product of the romantic era of skyscraper design, with Renaissance detail and is topped by a choragic dome that stands in incredible contrast to the rest of today's downtown architecture. Geology was a great factor in the use of the Renaissance style employing a variety of rock types together with brick and terra cotta to create the boldness and ornamentation required. The base is Town Mountain Granite, polished gabbro forms the window sills, and Bedford Limestone is used on top to emphasize the strength of the lower levels. This was followed by midlevel brick, then a setback to a variety of terra cotta crests, columns, urns, and the final turret. The Mellie Esperson Building is an example of late Moderne architecture. Some say that the more subdued style was chosen in deference to her husband. Others say it was simply the change in architectural style at the time and a little social history, too. However, she chose to stop the structure at the top setback of the adjoing Niels Esperson Building to allow a full view of its charograph. Geology and the carved silver-gray Indiana Limestone accentuate the vertical sense of the building. Geologists will note that weathering has highlighted the

Houston Rocks *continued on page 39*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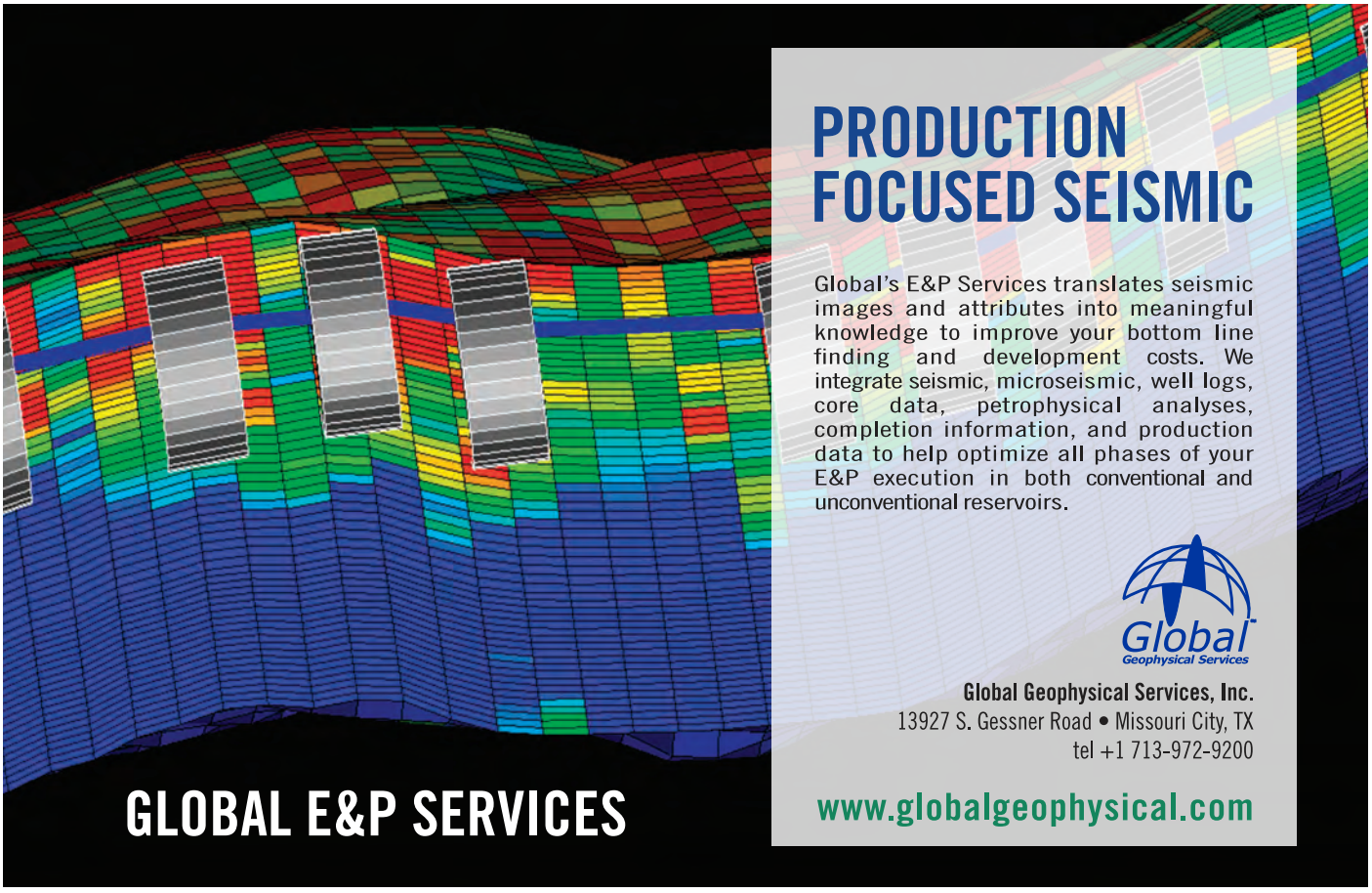
Houston Rocks continued from page 37

bedding planes of the limestone. The interiors of both buildings, joined through each's first floor, are a spectacular example of geology used to create an effect. The contrasting verde antique and symmetric marble slabs alone are worth a special field trip.

Now, the good news is that this field trip is coming back and hopefully will become a part of the ensemble of Houston walking tours. This is because our interest in the geology of the stones in Houston's buildings is shared by architects, historians, and many others in Houston. The Houston American Institute of Architects (AIA) Foundation has put together a new walking tour of Houston downtown building stones, drawing on this earlier work and adding new buildings, and thus new stones and their geologic stories. The AIA will have a test run of this tour this spring and then offer the tour as part of their Texas AIA meeting in the fall. Think about the HGS related meetings that might include this walking tour. Wouldn't you take this field trip information and slip downtown on a Sunday afternoon to learn more about a particular "outcrop"? Are there other buildings in Houston that have used interesting building stones that should be a part of this project? Surely there are. Could there be a Houston Wikirocks, an App? Think of the possibilities. To find out more, contact H.C. Clark (hcclark@rice.edu), Martha Lou Broussard (mlbrou@rice.edu), or Anna Mod (amod@swca.com). ■

Rice University wagon bumper



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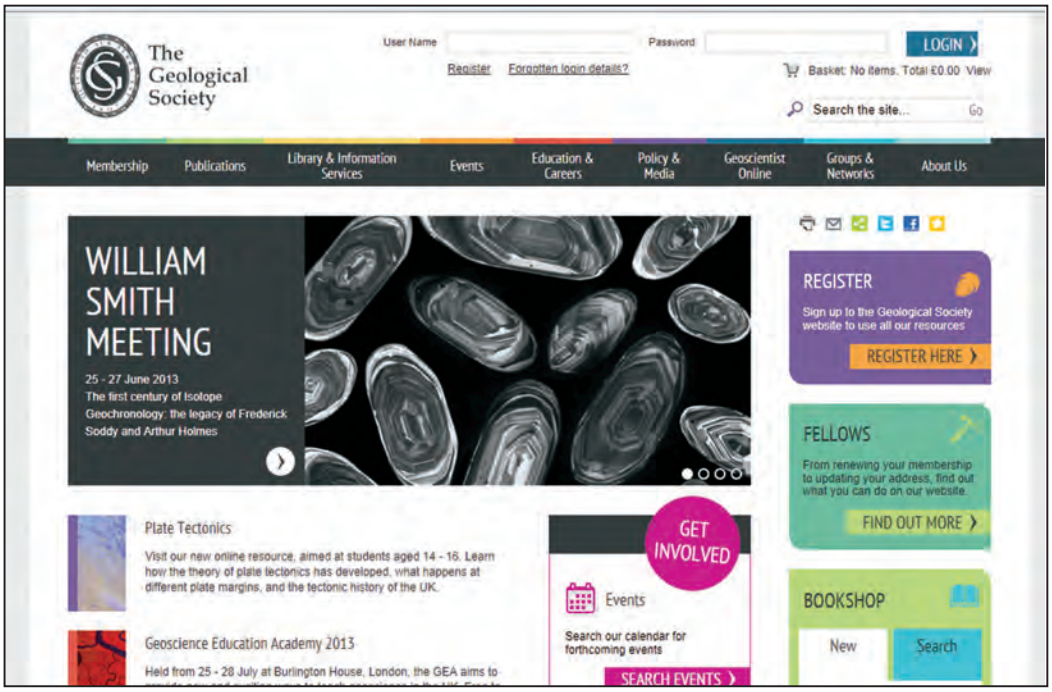
Geological Website of the Month

The Geological Society of London

www.geolsoc.org.uk

By Michael F. Forlenza, P.G.

In the world of geological societies, it does not get any more venerable than the Geological Society of London. The Geological Society of London, often referred to as "the Geological Society," or just "the Society," was founded in 1807, making it the oldest geological society in the world. The Society received its Royal Charter, which remains its governing instrument, from King George the Fourth in 1825. This granddaddy of geological societies is also the United Kingdom's national society for geosciences.



The Geological Society is a global leader in earth science publishing and hosts a large number of science meetings each year. It is a vital forum in which earth scientists from a broad spectrum of disciplines and environments can exchange ideas, and it is an important communicator of geoscience to government, media, education, and the broader public.

The Society provides a wide range of professional and scientific support to over 11,000 members, called Fellows, about 2,000 of whom live outside of the United Kingdom. This compares to the roughly 4,000 members of the Houston Geological Society. Fellows of the Geological Society of London are entitled to affix the letters FGS to their names.

The Website

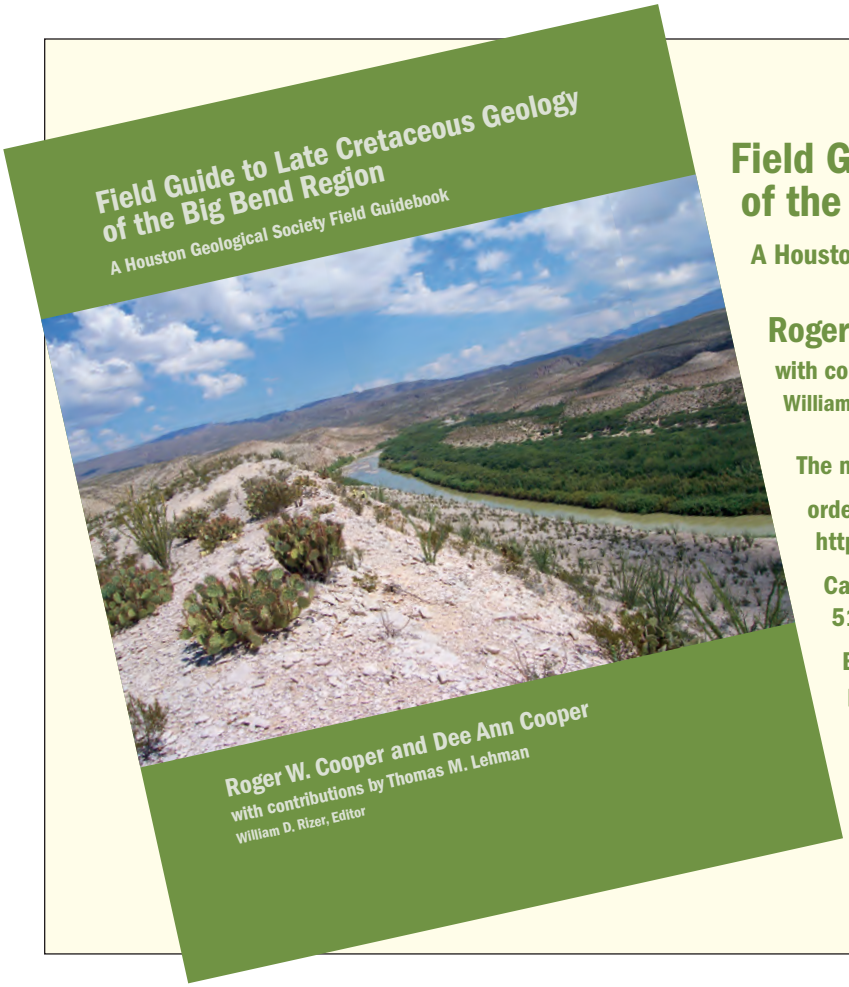
In accordance with its stature, the Geological Society has an extensive and modern-looking website. The website uses clean fonts and the familiar format of a homepage with a logo at the top left, a member's log at the top right, a topics banner running across the top which opens several subject areas, a cycling image of several current events, and various areas of links for visitors and members. Members of the Houston Geological Society, or of almost any professional society, will notice many familiar areas on the Geological Society of London's website. These areas include the "Join the Society" page, an online application, a description of fees and benefits, a listing of Society events, a directory of members, and job listings.

The Events calendar lists dozens of geological lectures, conferences, field trips, and meetings taking place all over England. If you are interested, you can register for a conference and field trip titled "Puddingstone and related silcretes of the Anglo-Paris Basin – geological and archaeological perspectives," on May 16th to 19th, or a conference titled "Reservoir Quality of Clastic and Carbonate Rocks: Analysis, Modelling and Prediction" on May 28th to 30th.

The Society hosts 24 specialist groups for scientists with specific interests in sub-categories of geology. Some of these are: Borehole Research Group, Forensic Geoscience Group, Gaia: Earth Systems Science Group, and the Geochemistry Group. Each of these specialist groups has its own sub-webpage under Groups & Networks. These groups are free to members to join and some are open to non-members.

Navigation around the website is somewhat twitchy and slow. Scrolling across the home page may cause numerous windows to flicker open and closed as the cursor passes through active areas. A visitor progressing downward into the sub-pages can feel disoriented. However, a click on the logo at top left always returns one to the homepage.

Geological Website of the Month *continued on page 43*



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Roger W. Cooper and Dee Ann Cooper
with contributions by Thomas M. Lehman
William D. Rizer, Editor

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Geological Website of the Month continued from page 41

The website features an animated learning area on the topic of plate tectonics that is worth a look. The link is in on the left side of the homepage and under Education & Careers. Here you can learn about the pioneers of plate tectonics, explore various plate margins around the world (divergent or convergent?), and test your knowledge with several quizzes. Did you know that "Proofreading Seals" is an anagram for "Sea Floor Spreading"?

Geological Society of London library

The best browsing is found under the Education & Careers heading. Here a visitor can find "The Rock Cycle," a web-resource aimed at UK science students which shows how surface and deep earth processes produce the rocks used for buildings stones and for decoration. There is also a series of color fact sheets highlighting the way geoscientists' work benefits society. These were prepared for use by policy makers, journalists, teachers, and students and are intended to highlight the importance of geoscientists in society.

A series of professional-level lectures on a diverse set of geological topics are presented in the Podcast section. Most are interesting, but disappointingly, they are audio only. A series of questions and answers titled "Ask a Geologist" provides information on a broad range of earth science subjects, mostly of interest to non-professionals.

More History

The London Geological Society was inaugurated on 13 November 1807 at a dinner at the Freemasons Tavern, which formerly stood at the site of the modern Connaught Rooms, Great Queen Street, Covent Garden. The Society was partly the outcome of an earlier club known as the Askesian Society. The minutes of that meeting recorded that there were thirteen founding members in attendance including Sir Humphry Davy (1778-1829) and several other prominent scientists and medical professionals. At the time, mineralogy was taught as part of medical training due to the need to use earth materials in medicine preparations.

At the meeting the founders resolved "That there be forthwith instituted a Geological Society for the purpose of making geologists acquainted with each other, of stimulating their zeal, of inducing them to adopt one nomenclature, of facilitating the communications of new facts and of ascertaining what is known in their science and what remains to be discovered." These aims were incorporated in the first constitution of the Society, formally adopted in January 1808. In 1810, the Society moved into rented premises at 3 Lincoln's Inn Fields, which it shared with the Medical and Chirurgical Society. The first volume of the transactions of the Geological Society was published in 1811.

The continual growth in the membership and of the collections of maps, sections, and mineral specimens necessitated a further move in 1816 to 20 Bedford Street, Covent Garden. Since 1874, the Society has been based at Burlington House, Piccadilly, London. Burlington House was developed by the government in the 19th Century as a meeting place for the arts and sciences. It shares the courtyard with the Royal Academy of Arts, the Royal Astronomical Society, the Society of Antiquaries of London, the Royal Society of Chemistry, and the Linnean Society of London. This building also houses the Society's library, which contains more than 300,000 volumes of books and journals, making this one of the largest and most important geological libraries in the world.

The Society counts many famous geologists amongst its past presidents. These include pioneers of the science such as Sir Roderick Impey Murchison, 1st Baronet FGS (1792 – 1871) and Sir Charles Lyell, 1st Baronet, FGS (1797 – 1875). Murchison was a Scottish geologist who first described and investigated the Silurian system. Lyell, trained as a lawyer, became the foremost geologist of his day, best known as the author of *Principles of Geology*, published in three volumes in 1830–33.

More Website

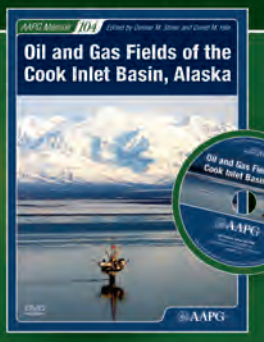
On the homepage banner there is a link to the Geoscientist Online page. *Geoscientist* is the monthly, full-color, magazine publication of the Society roughly equivalent to the Houston Geological Society *Bulletin*. Geoscientist is delivered in hardcopy to Society Fellows, but issues published since 2007 are available to anyone in electronic format on the website. The magazine, with a contemporary look and light-spirited editorial tone, presents

Geological Website of the Month *continued on page 45*

Memoir 104

Edited by Denise M. Stone and David M. Hite

Oil and Gas Fields of the Cook Inlet Basin, Alaska



This volume is intended to serve as a key reference to the petroleum geology of the Cook Inlet Basin for a wide audience including oil and gas explorers, technical professionals, students and those seeking more information about the origin and habitat of oil and gas in the area.

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Geological Website of the Month continued from page 43

several feature articles, GeoNews, letters, obituaries, crossword puzzles, events calendar, Society news, and humor items.

The online bookshop on the Publications page offers an extensive list of reference material available for purchase. Entering "submarine fan" into the bookstore search engine returned 10 reference books for sale.

The Policy & Media page presents news and updates for the press, policy makers, and the public interested in how the geosciences interact with society. This page includes a area for online debates (e.g., mantle plumes) and a listing of Society Policy and Position Statements on several subjects including: Shale Gas, Managing Radioactive Waste Safely, Climate Change, and Young Earth Creationism. [See the text box on this page for an excerpt from the Geological Society of London's December 2013 addendum on the 2010 Climate Change Statement.]

The resources of the Society are extensive and well catalogued on the website. One can get overwhelmed at the number of pages and links, including hundreds of links to outside resources, but a visit to the London Geological Society website is worthwhile for a geologist at any level and for anyone interested in geology. ■

Excerpt from the Geological Society of London's "Addendum to the Statement on Climate Change: Evidence from the Geological Record," December 2013

Since our original 2010 statement, new climate data from the geological record have arisen which strengthen the statement's original conclusion that CO_2 is a major modifier of the climate system, and that human activities are responsible for recent warming.

Palaeoclimate records are now being used widely to test the validity of computer climate models used to predict climate change. Palaeoclimate models can simulate the large-scale gradients of past change, but tend not to accurately reproduce fine-scale spatial patterns. They also have a tendency to underestimate the magnitude of past changes. Nevertheless they are proving to be increasingly useful tools...

Geologists have recently contributed to improved estimates of climate sensitivity (defined as the increase in global mean temperature resulting from a doubling in atmospheric CO_2 levels). Studies of the Last Glacial Maximum (about 20,000 years ago) suggest that the climate sensitivity, based on rapidly acting factors like snow melt, ice melt and the behaviour of clouds and water vapour, lies in the range 1.5°C to 6.4°C.

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Fractures, Folds and Faults in Thrusted Terrains, Sawtooth Range — September 8-13, 2014, Montana

Lacustrine Basin Exploration — September 14-21, 2014, Utah

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AAPG Education

A Look Back in Time

By Ken Nemeth, HGS President-Elect

As I continue to look at, and for, available information for past HGS Awardees, I uncover other items that might be of historical interest to members. For instance, our 1955 directory lists a total of five awardees. The 1957 directory showed seven. The 1963 directory lists twelve names. At that point in time, the only award given out by HGS was Honorary Life Membership. In the first thirty-nine years of existence, HGS only recognized twelve (possibly 14 based on a plaque in the HGS office) members for their service. The exact year of the awarding of one of those memberships is not recorded on the Honorary Life Members' plaque. There are two other member's names on the plaque that don't have dates:

- **Alfred Benz**, possibly between 1945 and 1951; but he is not listed in the HGS Directory as a recipient in the three directories that I checked.
- **John R. Suman**: although placed in the 1960 to 1961 range, I think that his award may have been presented earlier as his name appears in the list in the 1957 HGS directory. John was the first HGS president, an office he held for two years! He was extremely active in national societies. His AAPG memorial does not mention his service to HGS.

Given the position of their names on the Honorary Life Membership Plaque, some guesses can be made, but it sure would be nice if we could uncover the true dates of these awards.

Alva C. Ellisor, another of the five early recipients of Honorary Life Membership was the second Vice President for HGS. The date of her award is also missing from the plaque in the HGS office. However, in this instance her award date was mentioned in her AAPG memorial. She was truly a pioneer for women in geology in the oil industry. Perhaps one little known (remembered) fact about Alva is that she wrote the history of the first twenty-five years of HGS. I can't find a copy of her book in the HGS office. There are a couple of copies in the city of Houston, but it is tough to get a hand on either of them. Her book, "The Rockhounds of Houston," was published in 1947. HGS bestowed Honorary Life Membership on Alva in 1948. Does anyone have a copy of "The Rockhounds of Houston" they would be willing to let the HGS borrow so that we can make a copy?

The old directories carry a bit of history with them. But that's a story for another article. The first picture directory was published in 1955.

Continuing on with a view of where are they now, my searches of the online *Bulletin*s showed that there are no citations for the President's Award recipients in the *Bulletin* for the first three years that this award was presented. The first printed citations for this award were published in 1990. In a previous article, I looked at the initial recipients of this award from 1987. Here are the ten recipients who received this award in 1988 and 1989 but did not have a citation in the HGS *Bulletin*:

1988

Marilyn M. Gruebel is still an active member, living in Nacogdoches and doing business as RalMar Exploration. She was the *Bulletin* Editor in 1987-88.

George E. Kronman is still an active member and a Senior Geological Advisor at Hess. He received the Distinguished Service Award in 1991. George was *Bulletin* Editor for two terms 1989-90, 1990-91.

Edward McFarlan Jr. is deceased (2000). He served as Vice President in 1987-88 and on the Executive Committee from 1982 to 1984.

Santiago M. Reynolds is no longer an HGS member. His membership supposedly expired in 2010, but he is not listed in any of the directories on the HGS website going back to 2004.

Cyrus Strong's membership expired in 2013. He served as HGS President in 1991-92 after working his way up from Treasurer (1989-90) and Vice President (1989-90). Cy received the HGS Distinguished Service Award in 1995.

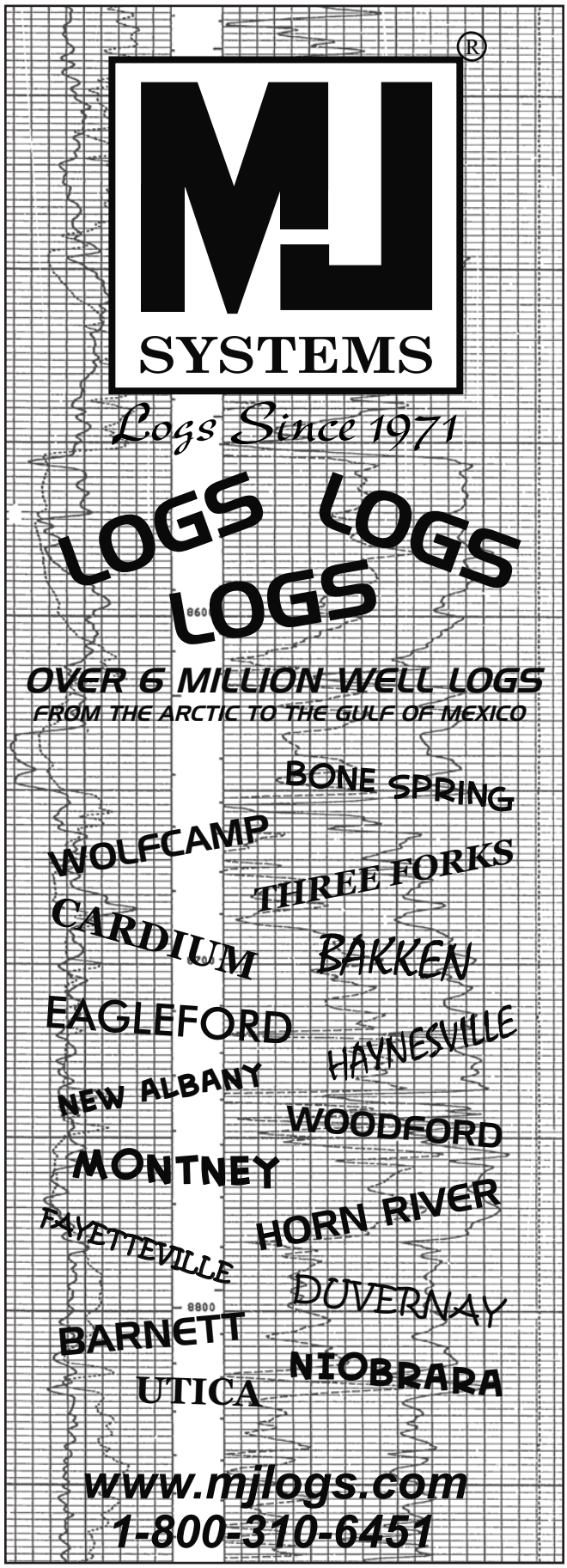
1989

F. Kenneth Aitken is deceased (2001). He received the HGS Distinguished Service Award in 1999. Ken served on the Executive Committee from 1988 to 1990.

Claudia P. Ludwig is still active and a long-time contributor to HGS. She received the Distinguished Service Award in 1994, Honorary Life Membership in 2004, and the Gerald A. Cooley Award in 2008.

W. Don Neville is still an HGS member and has served as an AAPG Delegate.

So, what else are the ten of you up to these days? To all HGS honorees, thank you for giving so generously of your time throughout your careers. ■



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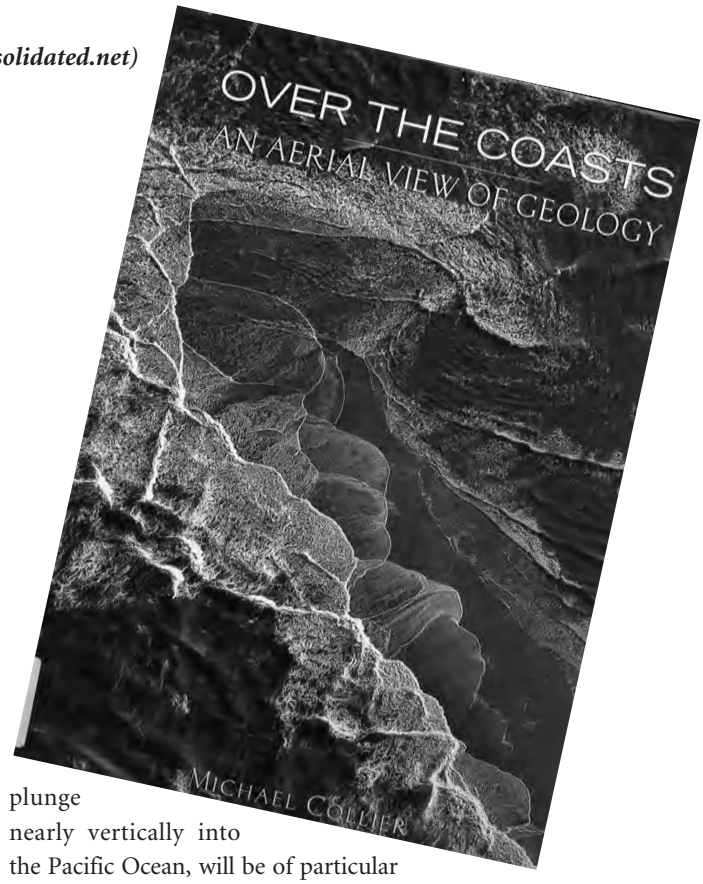
Book Review

by **George O. Chandlee (goc@consolidated.net)**

Over the Coasts: An Aerial View of Geology
by Michael Collier, 2009, Mikaya Press



Geoscientists use a myriad of tools to depict, describe, or otherwise define the Earth's dynamic surface. Narratives, drawings, diagrams, and satellite imagery, as well as ground-level photography, are among these tools. Another widely used tool is aerial photography. Aerial photographs present a mesoscale picture of the Earth's surface: they are not too small-scale or detailed so as to obscure features or too remote to reveal only very large features. Only aerial photography allows perceptions and interpretations for geological phenomena that exist between small and large scales. In the book *Over the Coasts: An Aerial View of Geology*, Michael Collier delves into these phenomena using aerial photographs with a deft and expert eye to present a very evocative survey of the dynamic geology of the coastlines of North America. Collier is a freelance writer, aerial photographer, pilot, and geologist who has received recognition for several books. He has also received the American Geological Institute's Award for Outstanding Contribution to the Public Understanding of the Geosciences. As such, he deserves recognition for bringing the particular power of aerial photography to render geological features and forms to the attention of the general public.

The book is in a large format which accentuates the central theme of the book: aerial photographs of various coastlines. After the introduction, there are five chapters, entitled as follows: the Poetry of Water, Dance of Sand; Coasting Around the Continent; the Human Presence; and a Solace of Wings. Photographs in the book, aptly placed to relate to the subject matter in each chapter, and are generally arranged in clockwise pattern around the North American continent from the North Atlantic, Southern Atlantic, Gulf Coast, Great Lakes, the Pacific, and Alaska.

The concepts discussed in the book are presented in terms clearly understandable to the general layperson and are presented in sufficient detail to be a significant educational resource. There are many engrossing full-page and two-page photographs. Each of these depicts the forces at work in the dynamic zone where oceans and lakes interact with land.

Noteworthy are the photographs along the California coast. These clearly show terraces that successively were beveled flat prior to the uplifts which have raised them above sea level, forming nearly vertical cliffs. Some very interesting photographs show the different chimerical geomorphologies and land forms that occur at active plate margins, such as California, and at passive margins, such as the Gulf of Mexico. For those who have driven Highway 1 along the California coast, several photographs showing the Santa Lucia Mountains along the highway, where uplift is occurring much faster than wave erosion, and the dramatically steep cliffs that plunge nearly vertically into the Pacific Ocean, will be of particular interest. Photographs of the Atlantic shoreline show the range of geomorphologies there: the barrier islands of North and South Carolina, the sandy and mercurial geomorphology of Cape Cod, and the seemingly immutable rocky coast of Maine. Photographs of the Columbia River at its confluence with the Pacific Ocean, and of tidal flats along the Washington coast are also interesting. Other photographs in the book are equally noteworthy.

Coastlines amply demonstrate the dynamic and quixotic nature of geological forces. The world's largest known wave was generated in 1958 at Lituya Bay, Alaska. The Fairweather Fault slipped, generating an 8.3 magnitude earthquake. Vertical fault displacement of over 30 feet and horizontal displacement of over 20 feet generated a wave nearly 200 feet high that traversed the bay, ramming into the shoreline. Vegetation differences clearly evident in an aerial photograph show the effect on vegetation where old-growth timber was uprooted as a result of flooding induced by the earthquake. In the time since, new vegetation has appeared.

Collier makes a point of showing how photographs uncover the impacts of human activity on coastlines. To demonstrate that the effects of human activity may be long lasting, Collier includes an image of San Pablo Bay north of San Francisco. The photograph shows how sediment released from hydraulic mining in the Sierra Nevada during the California gold rush has accumulated in what were once salt marshes. This impact is still evident today, more than 150 years later.

Book Review *continued on page 51*

Loyd Tuttle ltuttle@hal-pc.org
Bob Liska liska.bob@gmail.com
Jim Thorpe jthorpe@hal-pc.org

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Book Review continued from page 49

For reference, there is a map of the United States showing the locations where all the photographs were taken. This allows the reader to place the photographs in their physical location in North America, and leaves the reader with a sense of the scale and range of geographical coverage of the photographs. The book also has a glossary for quick reference of the terminology used.

If any comment were to be made concerning a minor soft spot of the book, it would be to mention a lack of diagrams regarding processes that are discussed in the text. The casual reader might be a little confused and unable to visualize the forces and principles that generate the terrains shown in the photographs. If so, this issue is addressed because Collier includes a list of Recommended Reading at the end of the book. However, it should be kept in mind that this book is meant to be a collection of photographs and, as such, it does the job admirably. The authoritative text accompanying the stunning photographs makes Over the Coasts an informative geology primer, an excellent resource to serve as a picturesque introduction to geology, and an attractive book sure to promote interest and conversation. ■

Remembrance

by David Miller

Should you hear of a fellow HGS member's or contributor's passing, please send information to the Editor-Elect at davidwayne.miller55@gmail.com.

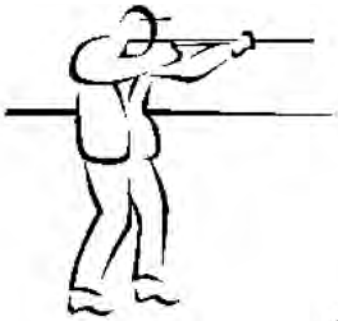
Charles Dawson McMurrey, Sr.

Charles Dawson McMurrey Sr. – also known as Sonny, Charlie and Mac – was born on September 7, 1923 in Coldspring, Texas. Raised in Oakhurst, he demonstrated an early interest in Thomas Edison and energy, wiring his town's telephone system so that he could talk to his girlfriend and eventually expanding this to other homes in Oakhurst. Later, under the Rural Electric Administration, he wired homes to earn money for his college education.

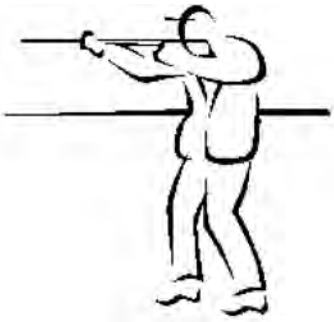
After attending one semester at Texas A&M University, he enlisted in the Army Signal Corps on December 7, 1942. He was part of the D-Day landing in Normandy and landed at Point Du Hoc, sharing a landing craft with famous war correspondent Ernie Pile. Later in life, he wrote his war memoir, *One Soldier's War*, which is in the reference library at the Memorial de Caen War Museum in Normandy. He was later formally thanked for his service by the French Government.

Upon his return from the war, he enrolled at Sam Houston Teacher's College where he met his future wife, Mary Lee Marshall and discovered the science of geology. He completed his geology degree at the University of Houston.

Mac began his professional career at Gulf Oil, as an exploration geologist. After 4 years, he was recruited by Claud Hamill of Hamill Resources, Inc. as an assistant geologist. Through the years, he worked his way up to become the President and Director of Hamill Resources Inc. In his more than 40 years with the company, he guided them drill more than 500 productive wells and steered them into the Hamill Foundation, where he served as Chairman of the Board. At the time of his death on March 7, 2014, he was Chairman Emeritus of the Hamill Foundation, which donates generously to many charities in the Houston area. ■



Annual
HGS SKEET SHOOT



Saturday, June 28, 2014
Greater Houston Gun Club
6702 McHard Road, Missouri City

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

IMPORTANT!!

WE ARE LIMITED TO 160 SHOOTERS IN FOUR ROTATIONS. ENTRY FEE IS $80 PER SHOOTER FOR REGISTRATIONS RECEIVED BY FRIDAY, JUNE 20. AFTER JUNE 20, REGISTRATION WILL BE STRICTLY ON A "SPACE AVAILABLE" BASIS AND THE ENTRY FEE WILL BE $95 PER SHOOTER. REGISTER EARLY!!

For more information, contact: Tom McCarroll at (713) 419-9414 or tom_mccarroll@yahoo.com.

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

****

ONLINE REGISTRATION INFORMATION AT: http://www.hgs.org/eventskeetshoot

If you prefer to pay by credit card, please call the HGS office, (713) 463-9476.

If you prefer to pay by check, mail this form with a check made out to HGS to:

Tom McCarroll, 2668 HWY 36S #329, Brenham, TX 77833

Name: _____ Company: _____

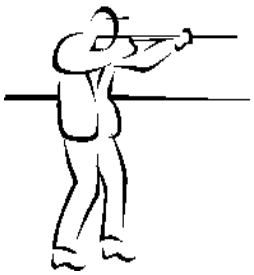
Email: _____ Phone: _____

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

Registration Fee: $_____ + Sponsor Contribution: $_____ = Total: $_____

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

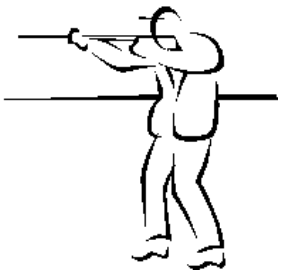
ALL SHOOTERS WILL BE REQUIRED TO SIGN A DISCLAIMER OF RESPONSIBILTY BEFORE THEY WILL BE ALLOWED TO SHOOT!



ANNUAL HGS SKEET SHOOT

Saturday, June 28, 2014

Greater Houston Gun Club
6702 McHard Road, Missouri City



SPONSORSHIP APPLICATION

Ammo Sponsor - $750.00
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

Cigar Sponsor - SOLD
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

Flurry Sponsor - $750.00
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

Field Sponsor - $750.00
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

Beverage Sponsor - $750.00
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

Cap Sponsor - $1000
- Sponsor Logo on Event Caps
- Paid squad of 5 Shooters
- Signage at the Club During Event
- Recognition at Awards
- Logo on HGS Website

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

HGS - 14811 St. Mary's Lane, Ste. #250 - Houston, Texas 77079 - Attn: Sandra

Or you can email your sponsorship form to sandra@hgs.org

Name _____ Phone _____ Amt. Enclosed_____

Company _____ Email _____

Billing Address _____

Credit Card # _____ Exp. Date _____ Sec. Code# _____

Approved by_____ Date_____

If you would like HGS to invoice your sponsorship please complete the section below:

Invoicing Address _____

Accounting Contact Name _____ Contact Email Address _____

Special Billing Codes _____

Approved by_____ Date _____

Please email your company logo to sandra@hgs.org. Note: Company logos (300+ dpi) must be received no later than May 1, 2014.

If there are any questions, please contact Tom McCarroll—713-419-9414 or tom_mccarroll@yahoo.com.

To register online, please go to http://www.hgs.org/eventskeetshoot

HGS Welcomes New Members

New Members Effective April 2014

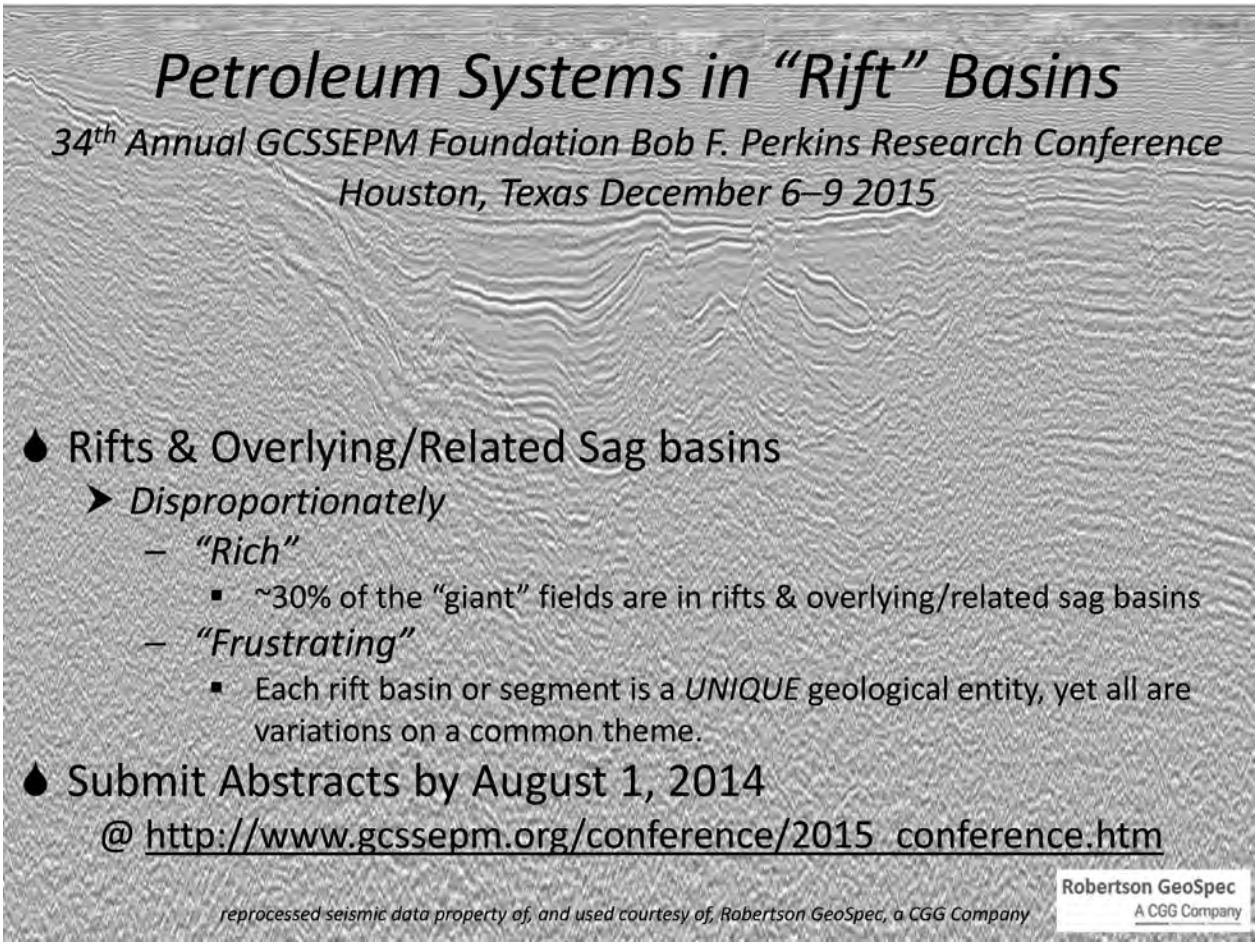
ACTIVE MEMBERS
Marielle Ausburn
Jennifer Ayers
Craig Barrie
Thomas Bowman
Kathleen Brant
Nick Downey
Robert Hargett
Morgan John
Susan Lundgren
Bianca Maibauer
Robert Merritt
Julie Ratcliff
Kevin Reilly
Claudia Santana
Skyler Smith
Neil Sullivan
Todd Tisch
Melissa Vallee
Nicole Vander Griend
Melissa Veltri
Brian Vesey
Julia Waldsmith
Tracy Wicker
Ronyld Wise
Neda Zangeneh
Craig Zimmerman

ASSOCIATE MEMBERS
Kari Anderson
John Platt

EMERITUS MEMBERS
Stanley Clowers
Donald Yurewicz

STUDENT MEMBERS
Imad Benariba
Michael Endsley
Katie Fry
Micah Gillum
Sarah Huff

Welcome New Members



Government Update

*by **Henry M. Wise, P.G.** and **Arlin Howles, P.G.***

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

AGI Monthly Review (February 2014)

House Aims to Hasten LNG Permits

The House Energy and Commerce Committee (E&C) issued a report encouraging the Department of Energy (DOE) to expedite permitting for liquefied natural gas (LNG) exports to non-free trade agreement (FTA) nations, including India and Japan. Since 2010, DOE has approved five permits, and still has more than twenty pending requests. The E&C report cites a National Economic Research Associates (NERA) report that states U.S. LNG supply is capable of meeting domestic and foreign demands while benefitting the U.S. economy.

The report threatens legislative action, such as allowing exports to World Trade Organization nations rather than FTA nations, if the DOE does not comply.

Rep. Upton (R-MI), Chair of the Energy & Commerce Committee, and others worry about LNG export competition from Canada, which has a total of six proposed export facilities on both the Atlantic and Pacific coasts. British Columbia, where five of the projects are planned, just released their proposed tax on exports.

The DOE's stance has remained firm since the E&C recommendation, stating it will continue to strictly adhere to permitting practices defined in the Natural Gas Act.

EPA Guidance Released on Diesel Use in Fracking

On February 11, 2014, the Environmental Protection Agency (EPA) issued a new set of guidelines on the use of diesel fuel in hydraulic fracturing activities. The guidelines include suggestions on well integrity testing and water quality monitoring. The recommendations are intended to help state and tribe permitting decision makers protect underground sources of drinking water from contamination.

The guidelines can be traced back to the Energy Policy Act of 2005, which lists diesel fuels as the only component in the underground injection of fluids or propping agents used in hydraulic fracturing for oil, gas, or geothermal production activities that can be regulated under the Safe Drinking Water Act (SDWA). EPA is responsible for implementing SDWA.

According to an EPA analysis of data from voluntary chemical disclosure registry FracFocus, diesel as an ingredient in fracking additives makes up less than 2 percent of fracking fluid. The EPA has reported only one case of diesel being used as a base fluid in hydraulic fracturing instead of water.

Industry representatives fear the new guidelines could be used to form new regulations.

Senate Addresses Chemical Spill And Water Contamination In WV

On February 4, 2014, the Senate Environment and Public Works (EPW) Subcommittee on Water and Wildlife held a hearing on safe drinking water supplies. This was one of a series of hearings convened as a direct result of the Freedom Industries chemical spill in West Virginia in January 2014 that spilled up to 10,000 gallons of 4-methylcyclohexene methanol (MCHM) and polyglycol ethers (PPh) at Elk River near Charleston, WV. The House Committee on Transportation and Infrastructure held a field hearing in Charleston, WV, to examine the same issue.

Freedom Industries has filed for bankruptcy to finance class action lawsuits from some of the 300,000 citizens whose drinking water was contaminated when the chemical plume reached the downstream supply intake of American Water Company utility.

EPW Chairwoman Barbara Boxer (D-CA) in her opening statement articulated that the current Toxic Substances Control Act (TSCA) classifies MCHM as "low priority." She argued the currently debated Chemical Safety Improvement Act introduced in 2013, would preclude states from acting and citizens from pursuing litigation on a low-priority contamination, such as the Freedom Spill. Sen. Boxer's bill, the Chemical Safety and Drinking Water Protection Act, would improve state inspections of above ground storage facilities and implement emergency response protocols in the event of a spill.

Administration Teams with France on Climate Change

The U.S. and France have teamed to lead an international initiative to address climate change. During a visit to the White House this February, French President Francois Hollande and President Obama committed to "pursue concrete actions" to reduce greenhouse gas (GHG) emissions in preparation for the U.N.'s 21st Conference of the Parties on Climate Change to be held in Paris in 2015.

The goal of the Conference is to engage both developed and

Government Update *continued on page 56*

Government Update continued from page 55

developing nations in a binding climate agreement to reduce GHG emissions. The terms of any agreement would be implemented beginning in 2020.

U.S. and India Attempt to Come to a Climate Change Agreement
Notable senior officials including Indian Ambassador to the United States, S. Jaishankar, and National Security Advisor to President Obama, Susan Rice, among industry leaders, environmental activists and other government officials attended a sponsored U.S.-India Strategic Dialogue to facilitate cooperation on greenhouse gas (GHG) emission standards between the two nations.

Tension stems from disagreement on 2007 adjustments to the Montreal Protocol, which was created in 1989 to reduce global emissions of ozone-depleting substances. Indian officials have publicly resisted including hydroflourocarbons (HFCs) produced by fossil fuel energy production under the Protocol because HFCs are not ozone-depleting substances even though they are powerful GHGs, according to Bloomberg. The adjustments created timelines for reduction of HFC emissions, hoping to reach global baseline levels by 2030. Indian Premier Manmohan Singh stated last year that India's current lack of viable non-HFC producing energy substitutes make the Protocol's HFC phasedown unfeasible.

In the dialogue, Rice highlighted recent cooperative developments between the countries. These include progress in nuclear power utility negotiations under the Civil Nuclear Cooperation Agreement, which aims to use American investments to build reactors powering New Delhi and Mumbai to decrease GHGs. Rice also praised the largest off-grid renewable power project in the world, Ladakh Renewable Energy Initiative, which aims to provide 20,000+ MW of power to northern rural India by 2022.

Conference attendees hope to turn dialogue into concrete progress before the UN Climate Summit in September.

EPA Reviews Nuclear Radiation Limits; NRC Reviews Nuclear Waste Storage
The Environmental Protection Agency (EPA) is in the process of updating some of its nuclear energy regulations, including nuclear operation and waste storage standards.

On February 4, 2014, the EPA issued a request for public comment on its Environmental Radiation Protection Standards for Nuclear Power Operations (www.gpo.gov/fdsys/pkg/FR-2014-02-04/pdf/2014-02307.pdf). The standards have not been updated since their formation in 1977. Advancements in radiation dose, risk methods and detection tools, as well as improved nuclear technologies have led the EPA to revise the rules. The EPA is also considering re-examining surface and groundwater contamination protections for reactor sites. The standards are open for comment until June 4, 2014.

The Nuclear Regulatory Commission (NRC) is in the process of revising its generic determination on the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor's licensed life for operation and prior to ultimate disposal. The NRC has prepared a Waste Confidence Generic Environmental Impact Statement, which suggests that it is feasible to store spent nuclear fuel safely beyond the licensed life of operation of a reactor.

Advances in scientific understanding and technology combined with concern about GHG emissions have renewed interest in nuclear power as a viable non-GHG-producing energy source.

Sec. Kerry and Administration Ramp Up Climate Rhetoric
The Obama Administration is strengthening its message on global climate change. In a series of speeches this February, Secretary of State John Kerry called upon the global community to do what they could to immediately reduce the impacts of climate change. Sec. Kerry announced that U.S. embassies across the world will realign to put climate change at the forefront of their diplomatic endeavors, and compared the threats posed by global warming to those posed by terrorism.

The Administration's climate change message is taking center stage as the President prepares to roll out a new proposal for a $1 billion climate change resilience fund.

President Hopes to Create New Climate Change Resilience Fund
This February the President pitched a new climate change resilience fund (www.whitehouse.gov/the-press-office/2014/02/14/fact-sheet-president-obama-leading-administration-wide-drought-response) to help communities across the country react to the impacts of climate change. At a speech in drought-stricken California, the President called upon Congress to approve his proposal, which would help communities deal with the intensification of extreme weather events and natural hazards.

The fund will focus on three things: Investing in new research to fortify communities against the impacts of climate change, helping communities plan and prepare contingency plans for future risks, and fund breakthrough technologies in infrastructure that will better withstand a changing climate.

Funding for the program will be included in the President's fiscal year 2015 budget, which is expected to be released on March 4, 2014. The fund will require approval from Congress.

New U.S. Special Representative for the Arctic Region
Secretary of State John Kerry announced this month that the U.S. will appoint an Envoy to the Arctic. The new position comes at the request of Alaskan lawmakers like Senator Mark Begich (D-AK) who argue that an official ambassador is necessary for the U.S. to remain competitive in the region. Other Arctic nations, such as Russia, are already beginning to stake claims to valuable

natural resources within the region, including oil, gas, and mineral plays. An American Special Representative for the Arctic signals the U.S.'s increasing interest in the quickly developing region.

Senate Investigates Federal Role in Mitigating Extreme Weather
On February 12, 2014, the Senate Committee on Homeland Security and Governmental Affairs held a hearing on "Extreme Weather Events: The Costs of Not Being Prepared." Discussion included dissemination of scientific information for disaster preparedness via the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12).

Two panels of witnesses agreed that disasters are occurring more frequently, and that the federal government, and therefore taxpayers, currently bears the brunt of costs for property and crop damage. According to risk management group Munich Re, U.S. total economic losses from weather catastrophes totaled over $1 trillion in last 30 years.

Witnesses focused on resilience strategies to mitigate natural disaster damages, including providing state and local governments access to the best available synthesized scientific data on potential hazards in their jurisdictions, educating the public on the science of the events and how the insurance industry works, investing in stronger infrastructure, and incentivizing states and individuals to invest in such long term benefit strategies.

BW-12 became law as part of the infrastructural overhaul MAP-21 signed by the President in 2012. BW-12 aims to better apply data on coastal erosion levels and changes in sea level to update regional flood maps. According to Federal Emergency Management Agency (FEMA), 20 percent of National Flood Insurance Program policies currently pay subsidized rates. The new law increases premiums for a portion of these policies. Premium increases are currently a subject of congressional debate.

NASA Looks to Industry to Secure Moon's Resources
In February 2014, NASA requested applications from private commercial spaceflight industries to partner with them in developing technologies capable of delivering cargo to the Moon. The request is an effort on behalf of NASA's recently created Lunar Cargo Transportation and Landing by Soft Touchdown (Lunar CATALYST) initiative, to support scientific research on the Moon in conjunction with commercial activities such as resource exploitation.

Resources such as rare earth elements and helium-3 have piqued private interest in lunar exploration.

California Drought Catalyst for Federal Action
The National Oceanic and Atmospheric Administration (NOAA) claims diminished precipitation levels over the past three years could be the worst in California's one-hundred-year recorded history. The drought has prompted legislative action from federal sources.

On February 5, 2014, the U.S. House passed (229-191) the Sacramento-San Joaquin Valley Emergency Water Delivery Act (H.R. 3964) that aims to overturn the San Joaquin River restoration in favor of delivering more water to the agriculture industry by lengthening irrigation contracts. The Obama Administration announced plans to veto the bill in the unlikely case that H.R. 3964 passes in the Senate.

Democrats have since introduced California Emergency Drought Relief Act of 2014 (H.R. 4039) and S. 2016 as counter bills, which provide $300 million in emergency funding for conservation projects while enhancing the San Joaquin restoration.

The Obama Administration is now working with California groups to mitigate emergency water shortages, allocating $115 million for farmers and ranchers and $68 million for affected communities. The Presidential office stated in the same press release that their 2015 budget request will include $1 billion climate resiliency fund for research, community preparation, and funding better technology and infrastructure.

AIPG eNews, February 18, 2014

1st Geologic Map of Jupiter's Largest Moon Made With Voyager Data
Maps have always been an integral part of exploration. They take the in out of terra incognita. Some things are easier to map than others, of course. The geology of a world a few hundred million miles away is one of those other things. Nevertheless, the United States Geological Survey just released a geologic map of Jupiter's moon Ganymede—an icy satellite larger than Mercury.

The map was created through the hard work of a team led by Wheaton College's Geoffrey Collins using imagery from the Voyager probes and the more recent Galileo mission. Much in the way that geologists can determine the relative ages of Earth rocks by noting which rocks cut into or through others, Ganymede's surface can tell us about its own geologic history.

The researchers identified three basic periods in that history, which they named the Gilgameshan, Harpagian, and Nicholsonian periods. The oldest is marked by an abundance of impact craters, the second by extensive tectonic activity that altered and deformed the surface, and the youngest by an absence of significant activity.

A PDF of the detailed map, which might look great on your wall, is available on the USGS website (http://pubs.usgs.gov/sim/3237/).

AAPG House of Delegates Candidates

We are providing a brief informational summary of 25 candidates for the HGS delegation to the AAPG House of Delegates. A formal ballot will be sent to those eligible to vote by AAPG. Each voting member will be asked to vote for 15 individuals.

The House of Delegates of the AAPG is made up of delegates from affiliated societies and international regions throughout the world. They are selected by popular vote from within their respective areas and serve a three year term.

Requirements of the delegates include:

- Familiarity with AAPG's Constitution and Bylaws
- Acquaintance with AAPG's current policies and programs
- Willingness to inform the leaders of their society or region regarding AAPG's program of activities, particularly as it relates to cooperative participation and service
- Ability to process requests from the AAPG Executive Committee for information regarding eligibility of applicants for membership in the Association
- Availability to serve as local certification committeemen to process requests from the Board of Certification for information regarding applicants for Certification by AAPG
- Willingness to actively solicit applications from eligible geologists for membership in AAPG

SANDI BARBER

It has been my honor to represent the Houston geological community in the AAPG House of Delegates for 24 years. I have used my experience in HGS committees and offices, especially as HGS President, to best represent my Houston colleagues in House committees and as the House Secretary-Editor. I deeply desire to continue to represent my colleagues and ask for your vote.

My professional background includes over 15 years in exploration/exploitation for Unocal and as consultant, and nearly 10 years as trainer and consultant in various geoscience software. ■

STEVE BRACHMAN

I have been an HOD representative for the past 14 years. I would be honored to continue serving as a delegate for the largest and most influential local Geologic Society in AAPG. I have 33 years of industry experience and am currently the VP of exploration and development for Wapiti Energy. I received the HGS Distinguished Service Award in 2001 and the AAPG - George C. Matson Award for best paper in 2006. My active roles in professional organizations have included: AAPG ACE 2014 General Chair, HGS President 2006-2007, AAPG - DPA Advisory Board 2001-2004, AAPG House of Delegates 2000-present, GCAGS Convention Academic Liaison Committee Chairman 2000, HGS Finance Committee Chairman 1997-2001, AAPG Convention Volunteer Committee Chairman 1995, HGS Secretary 1993-1994, HGS Treasurer 1992-1993, HGS Treasurer-Elect 1991-1992, GCAGS Convention Personnel Placement Committee Chairman 1990, HGS Personnel Placement Committee Chairman 1988-1981. I earned a B.S. in geology from Eastern Illinois University in 1981 and an M.S. in geology from Penn State University in 1983. ■

DENISE M. BUTLER

Denise has been employed by Shell Exploration & Production Company in Houston, TX since 2001 and is currently in New Ventures Basin Analysis Group. Previous roles in Shell include being the Exploration Geoscience Discipline Lead, providing functional leadership for exploration geoscientists in North and South America and assignments in Shell Deep Water Services, Basin Evaluation & Stratigraphic Services, Integrated Reservoir Modeling and Gulf of Mexico Technical Services Teams.

She has 30 years of professional experience in the oil and gas industry all in upstream exploration and production. Prior to coming to Shell she held positions at SOHIO, BP and Pennzoil in both domestic and international exploration and development. Denise has been active in GCSSEPM since 1984 and has served the section in many capacities; 1986-87 Vice President, 1987 Program Co-chairman 8th Annual Research Conference, Section President 1990-91, Foundation Trustee 1993-98 and Foundation President in 1998, and received the Distinguished Service Award in 1996 and the Honorary Member Award in 2010. She is an active member of AAPG and is currently serving on the Education Committee. She is also on the Advisory Council for the UT Jackson School of Geosciences, Advisory Committee for the GeoFORCE Houston, and Advisory Committee for GeoFORCE Alaska. She holds a B.S. degree in biology/geology and M.S. degree in geology, both from Tulane University. ■

MARLYN CISAR

Marilyn Taggi Cisar is a Regional Discipline Advisor for Production Geology in the Upstream Americas Unconventional organization of Royal Dutch Shell. She has over 35 years experience in the oil and gas industry as a development/production geologist specializing in lower-permeability onshore reservoirs.

Marilyn has an M.S. from Iowa State University in geology and a B.S. in Earth and Planetary Science from the Massachusetts Institute of Technology. She is a member of the American Association of Petroleum Geologists, Society of Petroleum Engineers, Houston Geological Society, and Pittsburgh Geological Society and is a Texas-licensed Professional Geoscientist (Geology) . She represented Houston on the AAPG House of Delegates for numerous terms over the past 20+ years and has been recognized by the AAPG with a Long Service Award from the House of Delegates. ■

SHARMA DRONAMRAJU

Sharma Dronamraju earned his M.S. in geology from Indian Institute of Technology (IIT, India) and from Texas A&M University, and his M.B.A. from Rice. He is a professional geologist with over 30 years in several areas in the upstream oil industry. He moved to Houston in early 90s and worked for NOCs, majors, service companies, and independents in Houston. His professional experience in exploration and production covers many parts of the world, including Australia, Far East, Nigeria, Latin America, and GoM.

Mr. Dronamraju currently heads AKD Professional Solutions, Inc. Houston, as Director. He offers consulting to upstream and midstream industry in field development and EOR, appraisals, and reevaluating mature basins all over the world. He is currently focused on sub-salt in GoM and on US onshore mature basins.

Mr. Dronamraju served on the Continuing Education, International Explorationists, and North American Committees of the HGS over several years and organized courses and workshops. He is an active Member of AAPG and HGS. Mr. Dronamraju has been an active volunteer in several Houston communities, a Mentor for Science and Technology Fairs with Houston Schools and Science Olympiad. ■

MIKE ERPENBECH

Mike Erpenbeck has 30 years experience in the oil and gas industry, holding a variety of geological and engineering positions. He has worked for Texas Oil and Gas, Pilgrim Exploration, Hemus Oil and Gas, and UMC Petroleum. In his most recent ten years, he has headed up project teams for a wide range of technical and economic analyses in upstream oil and gas as a benchmarking expert for Ziff Energy Group, an international energy advisory and consulting firm. He earned B.S. and M.S. degrees in geology from San Diego State University and Texas Tech University, respectively

Mr. Erpenbeck is currently on the Board of Directors of HGS as Treasurer to the Society, and is running for Society Vice President. He has recently served two years as Chair of the Office Management Committee, and is Treasurer for the 2015 GCAGS Convention. ■

JOE EUBANKS

Joe Eubanks is presently a Senior Staff Geologist for Newfield Exploration Company located in Houston, Texas. Joe focuses his efforts on the exploitation and development of existing fields in south and west Texas. Before joining Newfield, he was Exploration Manager for Preston Exploration, LLC located in The Woodlands and a Geological Engineer for Tenneco Oil Company in San Antonio and Houston, Texas. He graduated from the University of Texas at Arlington with a B.S. in geology in 1980. Joe is an AAPG Certified Petroleum Geologist and a Licensed Professional Geoscientist in the State of Texas.

Additionally, he has been a Committee Chairman, Executive Committeeman and "Presidents Award" recipient for the HGS. He has been a member of the AAPG since 1980 and a member of the HGS since 1982. Joe has been honored to serve as a delegate for the past nine years and has concentrated his efforts on increasing membership value. ■

GABRIEL GUERRA

Gabriel is a Brazilian sedimentologist, currently running Shell's Latin America Regional Team for deepwater exploration. He joined Shell in 2002 (coming from Enterprise Oil) and has explored for oil and gas in several areas around the world, including: Brazil, Niger Delta, Guyana, Colombia, Uruguay, China (Sichuan), and French Guiana.

AAPG House of Delegates Candidates *continued on page 60*

AAPG House of Delegates Candidates

continued from page 59

More recently Gabriel worked as the business opportunity manager for Shell's successful participation in the giant Libra deepwater discovery auction, in the Brazilian Pre-Salt. He holds a geology degree from the Federal University of Rio de Janeiro. ■

INDA IMMEGA

Inda Immega studied geology at Texas A&M and Indiana and, after earning her Ph.D., worked at Shell her entire career. She is now a full time volunteer at the Houston Museum of Natural Science, where she is a Master Docent and chairs HGS's Museum of Science Committee. Inda works in various outreach groups, especially the HGS's Earth Science Week Committee and AAPG's Youth Education Activities Committee. She has served as an elected Delegate or Alternate to the House of Delegates for a good number of years, and would be most honored to continue to use her time and energy in service to the Society's members. ■

JOHN E. JORDAN

He is a member of HGS, AAPG, AAPG HoD DPA, SEG, and TBPG. With the HGS, he has served in several positions as Treasurer, Board of Directors (2 terms), and Chariman of the International Explorationist. With the AAPG, he has served as Delegate (18+ years; Foreman one term) and on the AAPG membership committee, AAPG survey committee, and DPA membership committee. He also started and was first President of WSU student AAPG chapter.

During his professional career, he has worked at Chevron USA Western Region, Arco Oil & Gas Southern District, and Samedan Oil & Gas. He is presently employed with Kerr McGee Oil & Gas / Anadarko Petroleum Co. Mr. Jordan has earned a B.S. in geology/geophysics and an M.S. in geology/geophysics both, from Wright State University, Dayton, Ohio. ■

ALICIA KAHN

Alicia Kahn has been working as a nannofossil biostratigrapher at Chevron Corp. for the past seven years, exploring a wide variety of global basins. She is very involved in outreach and recruiting for Chevron. Along those lines, she is also a board member of AAPG Professional Women in Earth Sciences (PROWESS) and President-elect of North American Micropaleontological Section (NAMS) of SEPM. Alicia has been a member of AAPG since graduate school at Rutgers University and looks forward to the opportunity to serve as a delegate to become further involved in AAPG service. ■

NINA C. LIAN

Nina has been a geoscience consultant since 1997 and started Decipher Geoscience in 2001. She has consulted for a variety of companies including ExxonMobil, Pemex (through the Scotia Group), Total, Burlington Resources, Conoco Phillips and Shell. Nina began her geoscience career at the USGS and the Woods Hole Oceanographic Institute, Woods Hole, MA. She graduated from Cornell University with an M.S. in geology. Nina started in the petroleum industry with Exxon, first at EPR and then in exploration for 14 years before leaving Exxon to start consulting. Nina is a member of AAPG, SEG, GSH, HGS, SIPES, and SEPM. She holds a Texas Professional Geologist license and is a Certified Petroleum Geophysicist through AAPG/DPA and a Certified Petroleum Geoscientist through SIPES. Nina has served on the HOD for the past three years. ■

PATRICK J. MCCARTHY

Patrick J. McCarthy is president of Magna Operating, LLC, an independent oil and gas operating and prospect generating company. He has over 27 years of oil and gas experience in Gulf Coast exploration and development. Mr. McCarthy holds a Bachelor of Science Degree in geology (1986) from the University of Texas at Austin. He is a member of the Houston Geological Society, the American Association of Petroleum Geologists, and the Society of Independent Professional Earth Scientist. He served on the AAPG House of Delegates for two terms and currently sits on the HOD Nominations and Elections Committee. Mr. McCarthy is a registered Professional Geoscientist in Texas (#4695). ■

SANDRO MERCIO

Sandro Mercio is an Exploration Geologist at Shell, where he has been working over seven years on deepwater exploration and appraisal. He began his industry career working two years for Schlumberger on oil rigs as a Mud Logger and MWD Engineer. He then spent seven years in the ANP (Brazilian regulatory agency), where he worked on license rounds, acreage promotion and led the efforts to acquire new regional G&G data onshore and offshore. Subsequently he helped to set-up the technical E&P office for a small independent (Norse Energy) in Rio. He obtained a B.S. in geology, M.S. in structural geology and an M.B.A. (UFRJ, UFOP and COPPEAD) in Brazil. He has been a member of AAPG since 1999 and joined both the AAPG/DPA and HGS in 2014. He served as a member of the Ethics Committee for the Brazilian Association of Petroleum Geologists in 2010-2011. ■

APRIL PARSONS

I have very much enjoyed participating in the meetings and activities of the various professional associations to which I belong, and over the last few years have served on the AAPG Grants in Aid Committee which has been particularly rewarding. I am honored to be asked to serve in the AAPG House of Delegates to expand my involvement and volunteerism in the organization.

Ms Parsons earned an M.S. in geology from the University of Texas at Arlington and a B. S. in geology from University of Texas at Arlington. Professionally, she held the positions of Geologist at Marathon Oil Company, Senior Geologist at Statoil, Principal Geologist at Coastal/El Paso, Senior Explorationist at Spinnaker/ Hydro GOM, Leading Geologist at Statoil, Senior Exploration Geologist at Cobalt International Energy.

She is a member of the AAPG, Houston Geological Society, and Alaska Geological Society and is a Texas licensed professional geoscientist (#2410). She has been on the AAPG Grants in Aid Committee from 2010 to the present. ■

DEBORAH KING SACREY

Deborah is a geologist/geophysicist with 37 years experience in the Texas and Louisiana Gulf Coast and Mid-Continent areas of the United States. She received her degree in geology from the University of Oklahoma in 1976 and immediately started working for Gulf Oil in their Oklahoma City offices.

She started her own company, Auburn Energy, in 1990 and built her first geophysical workstation using Kingdom software in 1996. She has been working with SMT/IHS for the past 17 years in developing the Kingdom Software. She specializes in 2D and 3D interpretation for clients in the United States and internationally.

Deborah has been very active in the geological community. She is past national President of SIPES (Society of Independent Professional Earth Scientists), past President of the Division of Professional Affairs of AAPG (American Association of Petroleum Geologists), and is currently Treasurer of AAPG. She is also a DPA Certified Petroleum Geologist #4014 and DPA Certified Petroleum Geophysicist #2. She belongs to AAPG, SEG, PESA (Australia), SIPES, Houston Geological Society, and the Oklahoma City Geological Society (OCGS). ■

SARAH G. STANLEY

I am currently serving as Director, U.S. ET Operations Training and Certification for IHS (2011 to present). IHS acquired SMT in 2011. At SMT, I led the SMT Training Team, with responsibilities for overseeing all of SMT's global training. I provide training for IHS Kingdom geological and geophysical software applications, as well as data importing and project management. I serve as one of IHS Kingdom's designated subject matter experts for geological and geophysical applications and processes.

Prior to joining SMT I was employed by GeoQuest, a subdivision of Schlumberger, from 1998 to 2002. I was also Director of the Geoscience Technology Training Center, North Harris College from 1995 to 1998, and served as a voluntary advisor on geoscience training centers to various geological societies. I have over 33 years of industry experience, and have worked as a petroleum geoscientist in various domestic and international plays since 1981.

I hold a Bachelor of Science degree with majors in biology and general science and minor in Earth science, a Masters of Arts in education and Masters of Science in geology from Ball State University, Muncie, Indiana. I am both a Certified Petroleum Geologist, and a Registered Geologist with the State of Texas. I hold teaching credentials in both Indiana and Texas. I have been an HGS member and AAPG member since 1981 and in the AAPG House of Delegates from 2000 to the present.

I have been on the House of Delegates Delegate's Voice Editorial Committee and AAPG Continuing Education Committee and served as the AAPG Division of Professional Affairs Correlator Editor and the AAPG Sub-Committee Chair for Technical Training Centers. I was awarded the Houston Geological Society President's Award in 1999 and the American Association of Petroleum Geologists Special Award in 1999. With the HGS, I have served on the Employment Committee and Continuing Education Committee.

I believe absolutely in the work of the Houston HoD. The HoD not only vets new AAPG active members, the Houston HoD acts to represent all Houston Geological Society members to the leadership of the AAPG. We have a strong and active voice in the AAPG House of Delegates, and to the Executive Committee and Advisory Committee. I have enjoyed representing the HGS membership, and hope to continue for three more years. ■

AAPG House of Delegates Candidates *continued on page 62*

AAPG House of Delegates Candidates

continued from page 61

DENISE M. STONE

Denise M. Stone is an independent geological consultant who has been involved in international and domestic oil and gas exploration for over twenty years.

During her career she has worked at Unocal, Superior Oil/ Mobil, Amoco and BP. As a consultant she has worked for a variety of different clients on E&P projects. Denise has a B.S. in geology from Texas Christian University and a M.S. in geology from Memphis State University.

She has served the HGS in multiple leadership roles including past President (2002-2003). In addition, she is very active in the AAPG. In 2010, she completed a three-year term on the Advisory Council representing the Gulf Coast Region and she is a past Chairman of the Houston House of Delegates. Denise is a long standing member of the Publications Committee, and most recently served as editor of AAPG Memoir 104, Oil and Gas Fields of the Cook Inlet Basin, Alaska. She is a Licensed Professional Geoscientist (#1550) in the State of Texas and also is an AAPG Certified Petroleum Geologist (#5622). ■

RON TINGOOK

I am a Production Geologist at Shell currently working in the Gulf of Mexico. I have a Ph.D. from the University of Texas at Arlington, an M.S. from the Colorado School of Mines (CSM), and a B.Sc. from the University of Hawaii, Hilo, all in geology, and took earth science as an elective in high school.

During my education, I was active in the AAPG Student Association, and was president of the local chapter of the Student Association for a year while at CSM. I am a past recipient of the AAPG Grants-in-Aid, and I was a student volunteer at two AAPG conventions during my graduate studies. My experience with the AAPG as a student gives me the desire to be more involved professionally in the organization that has helped me so much during my education. This is primarily why I'd like to join the HoD, and I envision that as I advance in my career, so too will my involvement with the AAPG. ■

JIM TUCKER

I will be pleased to serve as a Delegate from the HGS to the AAPG House of Delegates, the legislative body of the AAPG. Over the years I have served as a Delegate or Alternate from the Los Angeles Basin, Dallas, and Houston local societies, and the Middle East Region. As the Association has evolved, the deliberations and decisions made at the annual House of Delegates meeting have directed its development and allowed the AAPG to respond to Members' needs. I have been a member of the AAPG since 1974, and the HGS since 1980 and observed these changes. I am also a member of the GSA, AGU, AIPG, YBRA, SPE, and other local geological societies. I am a licensed Geologist in California and Texas. My geology degrees are from Rice University (B.A.) and Texas A&M (M.S.). I look forward to serving as a Delegate from the HGS. ■

GERRIT WIND

I have participated in AAPG and HGS meetings for a number of years, if not decades, and if elected would be pleased and proud to serve as a Delegate to represent the HGS membership to the AAPG House of Delegates.

My background is ex-Amoco, mostly international. Since Amoco, I have done contract work in numerous and various places around the globe. I am currently doing mapping work offshore Angola for a large corporate client. ■

MIRIAM WINSTEN

With over 30 years of experience, Miriam is responsible for introducing the latest Schlumberger technologies to the oil and gas industry marketplace. She holds a B.A. in geology from the University of Binghamton, and a M.S. in geology from Bowling Green State University. Miriam is an AAPG Certified Petroleum Geologist and a licensed Professional Geoscientist in the State of Texas.

Prior to Schlumberger, Miriam taught geology and chemistry at the University of Findlay, as part of their Hazardous Materials Management Program. She began her career with Marathon Oil in 1982, where she was responsible for prospect generation and evaluation, exploitation, and field studies for onshore and offshore shelf and deep-water Gulf of Mexico. ■

JOSHUA D. WOODWORTH

Josh Woodworth is an Exploration Geophysicist with Shell E&P in Houston. The four years he has worked in the industry have given him experience in South American deepwater exploration, including carbonate and sandstone plays, as well as onshore exploration in California's San Joaquin Valley. Currently, Josh is exploring in the Eastern Gulf of Mexico. Josh holds a Bachelor of Science in geosciences with an

emphasis in engineering geology from San Diego State University and a Master of Science in geosciences with an emphasis in applied geophysics from Colorado State University. Prior to his studies and experience in the oil and gas industry, Josh served six years in the US Navy. ■

MATTHEW ZECHMEISTER

Dr. Matthew Zechmeister is a young professional with just over four years of experience in the industry. He earned his B.S. in geology from Grand Valley State University, his M.S. in geology from Southern Illinois University and his Ph.D. in geology from the University of Oklahoma. As a graduate student, he received a student research grant from AAPG as well as the Geological Society of America and ExxonMobil. This has given him the appreciation into how crucial these student grants, provided by professional organizations and industry, are for the development of the next generation of geoscientists.

Upon graduation he immediately began working as an Exploration Geologist for Shell Exploration and Production Company in Houston. The first three years were spent with the Alaska Exploration venture and for the last year he has been working as an Exploration Geologist in the Gulf of Mexico. His educational background was largely focused on structural geology and he has employed these skills maturing structurally complex prospects, as well as integrating tectono-stratigraphic models into play based exploration. Currently, he is also involved in drilling deep water exploration wells. As a New Technical Professional (NTP) at Shell he has helped organize and execute the annual Shell NTP Explorers conference which showcases the work being conducted within Shell by its young professionals. ■

Directory of Oil Company Name Changes

24th Edition (April 2014)

New Edition

A new 24th edition, of the HGS publication, "Directory of Oil Company Name Changes," is now available through the Bureau of Economic Geology. This publication is a cross-referenced list of domestic oil and gas, exploration and production companies that have sold major assets or have changed their names due to a merger, acquisition or reorganization. The purpose of this directory is to provide an oil company road map that may assist geologists in tracking down logs, samples, test information, cores, paleo, drilling reports, production histories and other well data that may be obscured by these numerous name changes.

The cost of the directory is $20.00 and it can be obtained from the BEG.
The contact information is as follows:
Bureau of Economic Geology
University of Texas in Austin • Attn: Publication Sales
University Station, Box X • Austin, Texas 78713-8924
Phone: (888) 839-4365 • www.beg.utexas.edu

Letters to the Editor

Michael:
You have written a superb article on the rare earths elements in the March issue of the HGS *Bulletin*. And "strategic geology" has a nice ring to it. I've followed the rare earth marketplace in the recent past with regards to investing. News articles indicate that the Mountain Pass mine will return to full capacity 2nd quarter of this year. Your insight into the Defense Logistic Agency also sounded compelling; perhaps demand will be increasing.

Of course, once we get out of our world of science, it becomes caveat emptor.

Regards,
Rick Dow

.....

Michael,
I just want to thank you for your commendable articles in the HGS *Bulletin*. They are timely, informative, quite interesting, and well written. Much appreciated.

Jerry Walker
Consulting Geologist
Reno, Nevada

Full Color Ads Now Available!

HGS *Bulletin* Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

Text should be submitted by email as an attached text or Word file or on a clearly labeled CD in Word format with a hardcopy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator, Canvas or CorelDraw. Files should be saved and submitted in .ai (Adobe Illustrator) format. Send them as separate attachments via email or CD if they are larger than 1 MEG each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .tif, .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 1 MB) or on CD or DVD.

Advertising

The *Bulletin* is printed digitally using InDesign. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email jill@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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10	$823	$1,387	$2,488	$4,734	$5,680	$7,830	$7,560	$6,858	$6,750	$2,700
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8	$750	$1,260	$2,242	$4,307	$5,169					
7	$665	$1,123	$2,014	$3,834	$4,600					
6	$590	$990	$1,782	$3,392	$4,069					$1,890
5	$497	$837	$1,503	$2,860	$3,432	$4,698	$4,536	$4,104		
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HGS has multiple website advertising opportunities for your company! We've expanded our offerings to include a 275 x 800 pixel, rotating banner ad on the front page of the website. We have kept the popular Event Calendar and Geo-Job Postings advertisement locations!

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We still offer Geo-Jobs - where your company can post job openings for 14 days at $50.00 or 30 days at $100.00.

For more information regarding website advertising visit HGS.org or email jill@hgs.org.

Application to Become a Member of the Houston Geological Society

Qualifications for Active Membership

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

Qualifications for Associate Membership (including students)

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

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

Annual Dues Expire Each June 30. (Late renewals – $5 re-instatement fee)
Annual dues are $24.00; emeritus members pay $12.00; students are free.

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

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Circle Preferred Mailing Address: Home Office
Professional Affiliations: _____
❑ AAPG member No.: _____
Professional Interest:
❑ Environmental Geology ❑ North American E&P (other than Gulf Coast)
❑ International E&P ❑ Gulf Coast E&P (onshore & offshore)

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

Earth Science Work Experience _____
_____
_____
_____

Applicant's Signature _____ *Date* _____

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

Name: _____

Signature _____ *Date* _____

Membership Chairman _____ *HGS Secretary* _____

revised 8/6/10

Houston Petroleum Auxiliary Council News

Edie Bishop, *HGS Liaison* 713-467-8706 or ewbishop@bishorb.com

As our organizational year winds down, we are all looking forward to taking a breather. It has been a good year, especially as the Houston geological community put on an excellent show hosting the American Association of Petroleum Geologist's annual convention, under the leadership of **Steve Brachman** and **Dave Rensink**. A special thanks to **Harriett Brittenham** and **Penny Nelson** for wonderful presentations as part of the enrichment programs in the Spouses' Hospitality Room. The year is not over and the fellowship continues with the Houston Geological Society celebrating with its June Guest Night at the Houston Museum of Natural Science and HPAC enjoying its May Style Show and Business Meeting.

Mark your calendars on Tuesday, May 20th for HPAC's Spring Style Show and Business Meeting Luncheon at the Houston Racquet Club. Chair **SaraNan Grubb**, along with her committee **Donna Parrish, Millie Tonn, Mickey Murrell**, and **Ruby Wagner**, has been hard at work planning this always popular event. Bags & More, a unique boutique located in the Memorial Area, will be supplying the fashions and HPAC members will serve as models.

In 1992, Kim Lamb opened Bags & More as a wholesale leather company that specialized in natural leather bags. The business has grown over the years to include clothing, accessories and a wonderful selection of jewelry. For the show, Kim has put together an attention getting array of clothing and accessories for our models to show as they move through the ballroom. In the background, Beverly Smolenski will provide some beautiful piano melodies. The meal, the setting, and the show at Houston Racket Club have been carefully chosen to reflect our comfortable springtime in Houston. This event is always a favorite among the HPAC members.

Following the Style Show, Nominations Chair **Mickey Murrell** and her committee members **Kathi Hilterman, Barbara Peck, Shirley Gordon** and **Nancy Fry** will present to the membership another strong slate of officers they have put together for the upcoming year. A special thanks is extended to our current board for sharing their talents, time, and commitment in making this a very successful year for HPAC.

Winona LaBrant, Sally Blackhall, Lupe Lopez and Mary Ann Putman at the Braeburn Country Club Luncheon

MIckey Murrell, Sheri McQuinn and Millie Tonn taking a break at Game Day

On May 5th, the Book Club will meet in the home of **Marge Shea**. Discussion leader **Sandra Pezzetta** has selected the book *Flight Behavior* by Barbara Kingsolver. Kingsolver was raised in rural Kentucky but lived briefly in the Congo which was the basis for her earlier book *The Poisonwood Bible*. Interestingly, she was an early member of the Rock Bottom Remainders, a rock-and-roll band made up of several renowned writers such as Amy Tan, Matt Groening, Dave Barry, Stephen King, Scott Turow, Mitch Albom, and Greg Iles. The band played for one week a year from 1992 through 2012. The term "remainders" is used for the manuscripts that are not selected for publication.

The next Book Club meeting will be held on August 4th in the home of Anita Weiner. Discussion leader, **Donna Parrish**, has chosen the book *Fly Away* by Kirsten Hannah. Please mark both these dates and try to attend.

An appreciation is extended to all our special interest groups leaders: *Bridge:* **Audrey Tompkins**, 713-868-0005 or **Daisy Wood,** 832-581-3231, *Book Club*: **Phyllis Carter**, 281-397-9888 or A**nita Weiner**, 713-572-9874, and *HPAC Exploring Houston*: **Martha Lou Broussard**, 713-665-4428 or **Linnie Edwards**, 713-785-7115. Spouses and guests are also always welcome and encouraged to attend all events.

Geologists, please encourage your spouses to join HPAC, where they will have an opportunity to meet other spouses of geologists, geophysicists, engineers, and landmen. They will participate in informative and entertaining programs, delicious lunches and welcoming fellowship. The HPAC membership form is included in the HGS *Bulletin*. Contact **Edie Bishop** at 713-467-8707 or ewbishop@bishorb.com for more information. ■

You are invited to become a member of

HPAC

2013–2014 dues are $20.00 Mail dues payment along with the completed information

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Sales Manager
Main +1 713 789 7250
Direct +1 281 781 1065
Fax +1 713 789 7201
Mobile +1 832 372 2366
alvin.rowbatham@iongeo.com
2105 CityWest Blvd. | Suite 900
Houston, TX 77042-2837 USA
iongeo.com

Crescent Geo LLC
Amir Zaman
Vice President, Business Development
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Email: ddudley@seisware.com

Support
Toll Free: 866.914.9047
Email: support@seisware.com

ion
GEOVENTURES™

Ashley Garcia
Assistant Program Manager

Main +1 713 789 7250
Direct +1 281 781 1005
Fax +1 713 789 7201
Mobile +1 281 239 4576
ashley.garcia@iongeo.com

2105 CityWest Blvd. | Suite 900
Houston, TX 77042-2827 USA
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Kara C. Bennett
Consulting Geoscientist

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Direct: 713-335-3021
Fax: 713-972-1180
CHARLES@AKLAW.COM
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JAMES M. NORRIS
CONSULTING GEOLOGIST

Certified Petroleum Geologist
Development/Exploration

713-376-9361 jmnor@suddenlink.net

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global business development
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SeismicVentures

Robert D. Perez
Business Development Manager
r_perez@seismicventures.com

Seismic Ventures, LLC
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Steve Cossey
Chief Geoscientist

Cossey & Associates Inc.
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President
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V. P. Business Development
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f (281) 558-5783
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www.petrophysicalsolutions.com

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ROBERT BEAL
Director of Operations
Agile Seismic LLC
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Kyle Hill
SALES REPRESENTATIVE
EMAIL
kyle.hill@zbytedata.com
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Consulting Geophysicists
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SeaBird Exploration
Matthew J. Padon
Business Development Manager
SeaBird Exploration Americas
1155 N. Dairy Ashford, Ste. 206
Houston, TX 77079 USA
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Telephone: +1-281-556-1666
Mobile: +1-281-686-4374
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Account Executive
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heather.wilson@geotechmap.net
Heather Wilson
Account Manager
www.geotechmap.net

SeismicVentures
Sara Davis
Business Development Manager
s_davis@seismicventures.com
Seismic Ventures, LLC
4805 Westway Park Blvd.
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Houston, Texas 77041
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William E. Ellington Jr., PE
President
Ellington & Associates, Inc.
Phone: (713) 956-2838
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Sophia Hak
Account Manager
Resolve GeoSciences, Inc.
431 Mason Park, Suite B
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Cell: 832-250-4823
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Katherine Pittman
Vice President of Sales & Marketing
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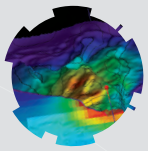

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