HGS Bulletin
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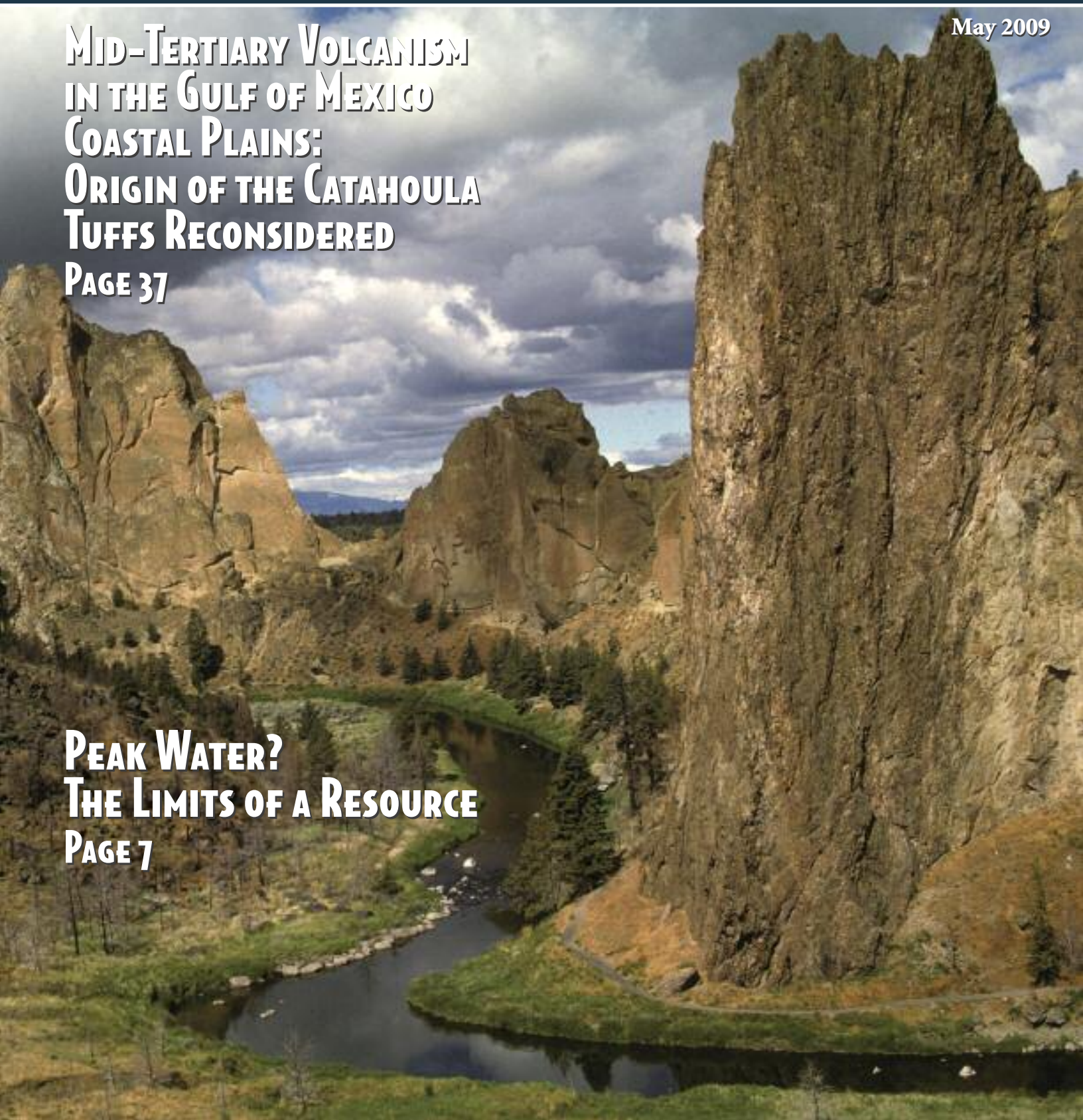

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Houston Geological Society

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About the Cover: *The Crooked River winds through Smith Rock State Park, Oregon. The cliffs on the north side (right) of the river consist of Miocene tuff and a prominent rhyolitic dike (right edge of photograph). A Pleistocene basalt flow, which probably originated from Newberry Volcano to the south, forms the lower bluffs on the south bank of the river.* Photograph by Marli Bryant Miller, University of Oregon. www.marlimillerphoto.com

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9th ANNUAL GSH/HGS SALTWATER FISHING TOURNAMENT

Saturday, June 20, 2009

Tackle Box Storage & Fish Spot Marina • 4009 20th Street North • Texas City, Texas

Galveston Bay Complex and Offshore

This year's Saltwater Fishing Tournament will include an Offshore Division to be held on Saturday, June 20 at the Tackle Box Storage & Fish Spot Marina, Texas City, Texas. We are looking forward to a big event this summer and we encourage full family participation.

Galveston Bay Complex Division

Trophies will be awarded for the heaviest individual Redfish (Non-Tagged), Speckled Trout and Flounder. Trophies will also be awarded for the heaviest individual Stringer-1 Redfish, 3 Speckled Trout, and 1 Flounder.

Galveston Offshore Division

Trophies will be awarded for the heaviest individual Red Snapper, King Mackerel, and Mahi-mahi.

Registration fee includes: Launch Fee, GSH/HGS Fishing Cap, Fish Fry Meal after weigh-in, Refreshments, Trophies, and DOOR PRIZES.

For more information, please contact:

Bobby Perez (HGS & GSH) • 281-240-1234 ext. 219 Office • 281-240-4997 Fax • 281-787-2106 Cell • 281-495-8695 Home

E-mail addresses: rdphtx@aol.com or r_perez@seismicventures.com

The Geophysical Society of Houston and the Houston Geological Society are non-profit organizations serving the Geoscience Community. Corporate and individual contributions are appreciated and will be acknowledged on several sponsor boards and banners at the Weigh-In Station and Marina. All contributors will be recognized in the GSH newsletter and HGS *Bulletin* following the tournament. This is a great way to entertain friends, family, business associates and clients. So spread the word!

GSH/HGS SALTWATER TOURNAMENT

NAME: _____ COMPANY: _____

ADDRESS: _____

PHONES: (H) _____ (B) _____ (C) _____

E-MAIL ADDRESS: _____

Upon receipt of the registration form, each participant will be provided with a copy of the specific tournament itinerary and rules sheet by e-mail. Please register **EARLY.**

Please return this form with your check for $60.00 per contestant payable to:
GSH/HGS SALTWATER TOURNAMENT and Mail to:
Geophysical Society of Houston, 14811 Saint Mary's Lane, Suite 250 • Houston, Texas 77079

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

DISCLAIMER:
I acknowledge that neither the Geophysical Society of Houston nor the Houston Geological Society will be held responsible for injury or accidents during this event. PRACTICE SAFETY!!!!!

Signature: _____ Date _____

Kara Bennett
kcbhgs@gmail.com

Creativity, Experience, and Enthusiasm

I recently attended a reception for the students and faculty sponsors of teams in the Imperial Barrel Award competition (HGS is a sponsor). Started at Imperial College, this competition consists of teams of mostly graduate geology students who are given a data set including well logs and seismic data and a summary of information about a prospective basin. They have six weeks to develop a viable prospect, which must then be presented to a committee of industry judges. The competition provides an excellent simulation of a real-world exploration problem, and it has become increasingly popular over the last several years.

I was very impressed with the quality of the students participating in our regional competition. These students were bright, personable and enthusiastic, and best of all, they were excited about the oil and gas industry.

During the reception, I spoke to another attendee who was chief geologist for a division of a large local company. His company planned to bring in a number of summer interns this year, and we chatted about the high quality of the students at the competition. "The great thing about students is that they don't know what can't be done, so they just go ahead and do it. I wish there was a way to restore that mindset to my staff," he said.

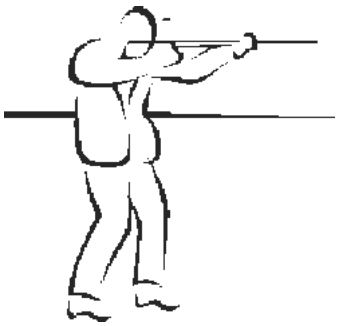
I think he's got a point. After you've been in the business for a while, it is easy to know what can and cannot be done. This is usually called "experience," and it's the reason experienced geologists are valuable to a company. But it's also easy to fall into a pattern of doing what you know works, and after a decade or two, that can become complacency. How can we maintain a creative mindset, and remain open to possibilities? How can we reframe what we know into a new set of ideas?

Summer interns have an advantage in that they generally have a finite project. Their data have generally been gathered before they arrive, and they are presented with a problem that needs to be solved. They have few distractions and one deadline, the end of the summer. They are encouraged to venture far and wide in a company, to ask advice of experts, to follow their curiosity down new paths of thought, and to bounce their ideas off their advisors. The projects they work on tend to be things that their companies want to know, but aren't urgent enough to place a staff member onto full time. Often the projects come from an idea a staffer has wanted to follow but hasn't had time because other projects have higher priority.

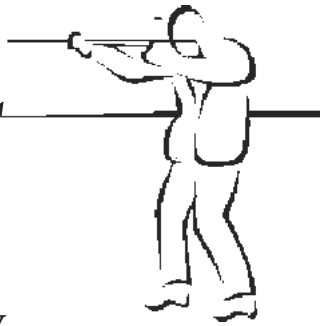
Why not set out the same set of circumstances for the geological staff, in a structured manner? Develop a 3-month "in-house sabbatical" program available to staff geologists every few years, to encourage the creative application of experience to reframe a problem, or to come up with some new ideas. Some of us are able to do this regularly, but others may need to step out of the day-to-day press of business into a more protected environment to rediscover their own creativity. Providing a protected environment to encourage creative thinking says that creativity is valued, and we all know that in geology, creativity can provide concrete economic results.

Develop a three-month "in-house sabbatical" program available to staff geologists every few years, to encourage the creative application of experience to reframe a problem, or to come up with some new ideas.

May brings us some excellent talks, beginning with Dr. Lesli Wood (TBEG) speaking at the May 11 General Dinner about the processes, sources and sinks for sediments moving along the eastern Mexico margin. May 14 we will hold a Continuing Education class on "Reservoir Engineering Tools for Geologists," and at the International Dinner May 18, we'll hear Carol Law (Anadarko) speaking about opening a new exploration frontier in Mozambique. May 19, Bob Hardage (UT Austin, Distinguished Speaker) speaks at the Northsiders' lunch about deepwater hydrates in the Gulf of Mexico as an exploration target, and at the Environmental and Engineering dinner, Anton Rozsypal and Paul Lewis (TCEQ) will discuss rule changes to the TRRP and above- and underground storage tanks. I hope to see you there. ■



26th Annual HGS SKEET SHOOT



Saturday, June 27, 2009

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. 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 a.m. until 1:30 p.m.
Refreshments will be available throughout the day.

IMPORTANT!!

WE ARE LIMITED TO 160 SHOOTERS IN FOUR ROTATIONS. ENTRY FEE IS $65 PER SHOOTER FOR REGISTRATIONS RECEIVED BY FRIDAY, JUNE 19. AFTER THAT, REGISTRATION WILL BE STRICTLY ON A "SPACE AVAILABLE" BASIS AND THE ENTRY FEE WILL BE $80 PER SHOOTER. REGISTER EARLY!!

For more information, contact: Tom McCarroll at (713)419.9414 or tom_mccarroll@yahoo.com.

****

HGS SKEET SHOOT REGISTRATION FORM

Name: _____ Company: _____

Email: _____ Phone: _____

Preferred shooting time: (circle one) 9:00 10:00 11:00 12:00

Indicate ammunition required: (circle one) 12 gauge 20 gauge

Please return form(s) with check for $65.00 per shooter, payable to:
Houston Geological Society

★ New Address ★ Mail to: ***Tom McCarroll • 2668 Hwy 36 S, #329 • Brenham, TX 77833*** ★ New Address ★

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

If you wish to shoot with a specific squad (5 shooters max.), please submit all forms together.

****

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

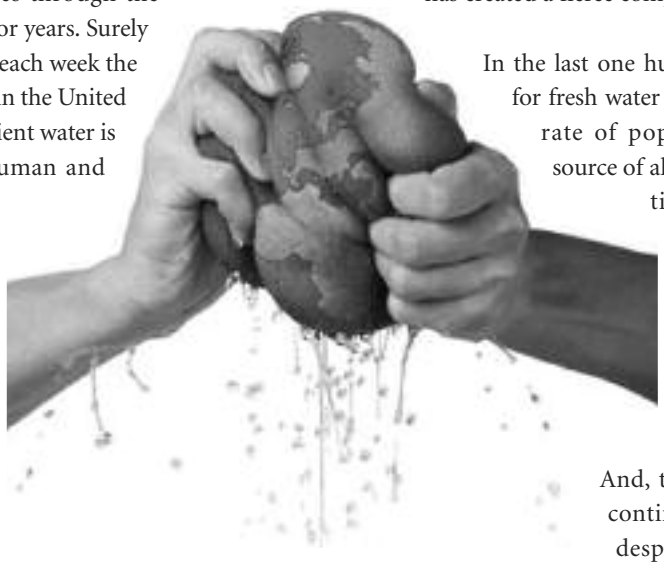
Michael F. Forlenza, P.G.
hgs.forlenza@gmail.com

Peak Water? The Limits of a Resource

When you turn on the faucet at your kitchen sink what do you expect to happen? You expect to get an unlimited supply of fresh potable water to use as you choose in your daily activities such as cooking, cleaning, drinking, flushing, and watering. In most of the developed world, this availability is hardly considered. But just where does that water come from and is it really unlimited or is the earth headed for a crisis?

We never know the worth of water till the well is dry.
Thomas Fuller, Gnomologia, 1732

Water is the ultimate renewable resource. It falls from the sky and a vast reservoir covers 70 percent of the globe. There is no less water today than there was 100 years ago, 1000 years ago, or even a million years ago. Water cycles through the biosphere in a matter of months or years. Surely there is no shortage of water. Yet, each week the media reports on another region in the United States or the world where insufficient water is causing economic hardships, human and ecological suffering, or conflict.



It turns out, that for a large part of the world, there is a shortage of usable, fresh, clean water. Whether due to climate change, poor resource management, over population, reckless use, or willful neglect, more than one billion people do not have access to an adequate supply of potable water and more than 2.5 billion do not have water for basic sanitary needs. Does this scarcity mark the limit of the resource? If water is the new oil, have we reached "Peak Water?"

Reaching the Limits

Approximately 97.5 percent of all the water on Earth is salty or polluted and unsuitable for human use. Of the remaining 2.5 percent, nearly 70 percent is frozen in the ice caps of Greenland and Antarctica. Large amounts of the unfrozen fresh water are found in soil moisture, trapped in deep water-bearing formations, or present as atmospheric water vapor. Only about one percent of the world's fresh water, less than 0.01 percent of all of the world's water, is available for direct human use in lakes, rivers, reservoirs, and easily accessible aquifers. Like oil, water is not equitably distributed, respectful of political boundaries, or found in abundance where the demand is greatest. Just as some nations have great oil resources and others do not, so it is with water. About 50 percent of the world's fresh water lies in just a half-dozen lucky countries led by Russia and Brazil. This has created a fierce competition for this fluid treasure.

In the last one hundred years, worldwide demand for fresh water has increased six-fold – twice the rate of population growth. The ultimate source of all available fresh water is precipitation that falls on the continents. This amount is estimated be approximately 40,000 to 50,000 cubic kilometers per year. And with annual population increases of about 85 million per year, the availability of fresh water per person is diminishing rapidly. And, this assumes that the amount of continental rainfall remains constant despite evidence that climatic shifts may be altering long-term precipitation patterns.

Agricultural uses put tremendous stress on available fresh water resources. Approximately 70 percent of all fresh water is used for agricultural purposes worldwide. Dry Pakistan uses 97 percent of its fresh water for agriculture, and China, with 20 percent of the world's population but only 7 percent of its water, uses 87 percent of its fresh water to irrigate crops. **From the Editor** *continued on page 9*

From the Editor continued from page 7

Globally, many regions are facing water crises. A few of these are:
Australia. Australia is the most arid continent after Antarctica. Even with a population less than one-tenth of the United States, water resources are stretched to the breaking point. The worst drought in history is ravaging the nation. Rainfall has declined to 25 percent of the long-term average and is projected to plummet another 40 percent by 2050. Every major city in Australia has severe water restrictions in place and agriculture is crippled. In 2008, huge unchecked wildfires swept across the desiccated landscape.

This is a western grey kangaroo, photographed in 2002, halfway through Australia's worst drought in 120 years. Over 90 percent of the kangaroos on Yathong Nature Reserve died during the dry spell. Source: University of California Berkeley, College of Natural Resources.

Middle East. A 2008 report by the World Bank estimates that the amount of water available per person in this arid and politically volatile region will halve by 2050.
Africa. Desertification has allowed the Sahara to claim large stretches of the surrounding countries. Lake Chad, one of the largest lakes in the world when first surveyed in 1823, has shrunk from a surface area of approximately 10,000 square miles in 1960 to less than 600 square miles by 2000. "Africa is one of the most water-impoverished regions...and the lack of clean water claims the lives of 4,900 children every day," United States House Foreign Affairs Subcommittee on Africa Chairman Donald Payne said in 2007.

If the wars of this century were fought over oil, the wars of the next century will be fought over water.
- Ismail Serageldin, VP World Bank, 1995

China. The Yellow River, China's second longest, supplies water to over 150 million people and irrigates 15 percent of the country's farmland. But in recent years, water levels in the upper reaches of the river have hit historic lows and it has occasionally run dry before reaching the sea. Probe International, a leading development policy group, has warned that the city of Beijing faces economic collapse and will need to resettle part of its population in coming decades, as it could run out of water in five to 10 years. China is in the process of building the multi-billion dollar North-South Water Diversion Project to bring water from the nation's longest river, the Yangtze, to the parched north.

Conflict

A study showed that 85 percent of the world's population resides in the drier half of the Earth where the limited resource is stretched thin. Many people in these regions are forced to turn to polluted water for their daily needs. Unsafe water is the primary cause of mortality around the world and kills ten times as many people as wars. Every year, eight million people, including 1.8 million children, die of the water-borne diseases diarrhea, cholera, typhoid and malaria.

Water, water, every where,
And all the boards did shrink;
Water, water, every where,
Nor any drop to drink.
- Samuel Coleridge (1772-1834).
The Rime of the Ancient Mariner, II

Water woes could have an impact on global peace and stability. In January 2007, United Nations Secretary-General Ban Ki Moon cited a report by International Alert, a self-described peace-building organization based in London. The report identified 46 countries with a combined population of 2.7 billion people where contention over water has created "a high risk of violent conflict" by 2025.

The developing world is dividing into those who have sufficient water and those that want more. Stronger nations and rising economic powers such as China and India, coveting the weaker neighbor's water resources, may resort to unfriendly means to gain control of this wealth. China's looming water crisis has them eyeing the abundant resources in Tibet. The London Times reported in 2006 that China is proceeding with plans for nearly 200 miles of canals to divert water from the Himalayan plateau to China's thirsty central regions. Himalayan water is a particularly sensitive issue because that source supplies the headwaters to rivers that bring water to more than half a dozen Asian countries. Any plans to divert Himalayan water will likely cause great concern among Southeast Asian nations.

Canada, which has immense fresh-water resources equaling approximately 20 percent of the world total, is wary of its water-thirsty neighbor to the south. Water raises national fervor in Canada, and Canadians are reluctant to share their birthright with a United States that they perceive as profligate and with a long history of mismanagement of their own supplies.

From the Editor *continued on page11*

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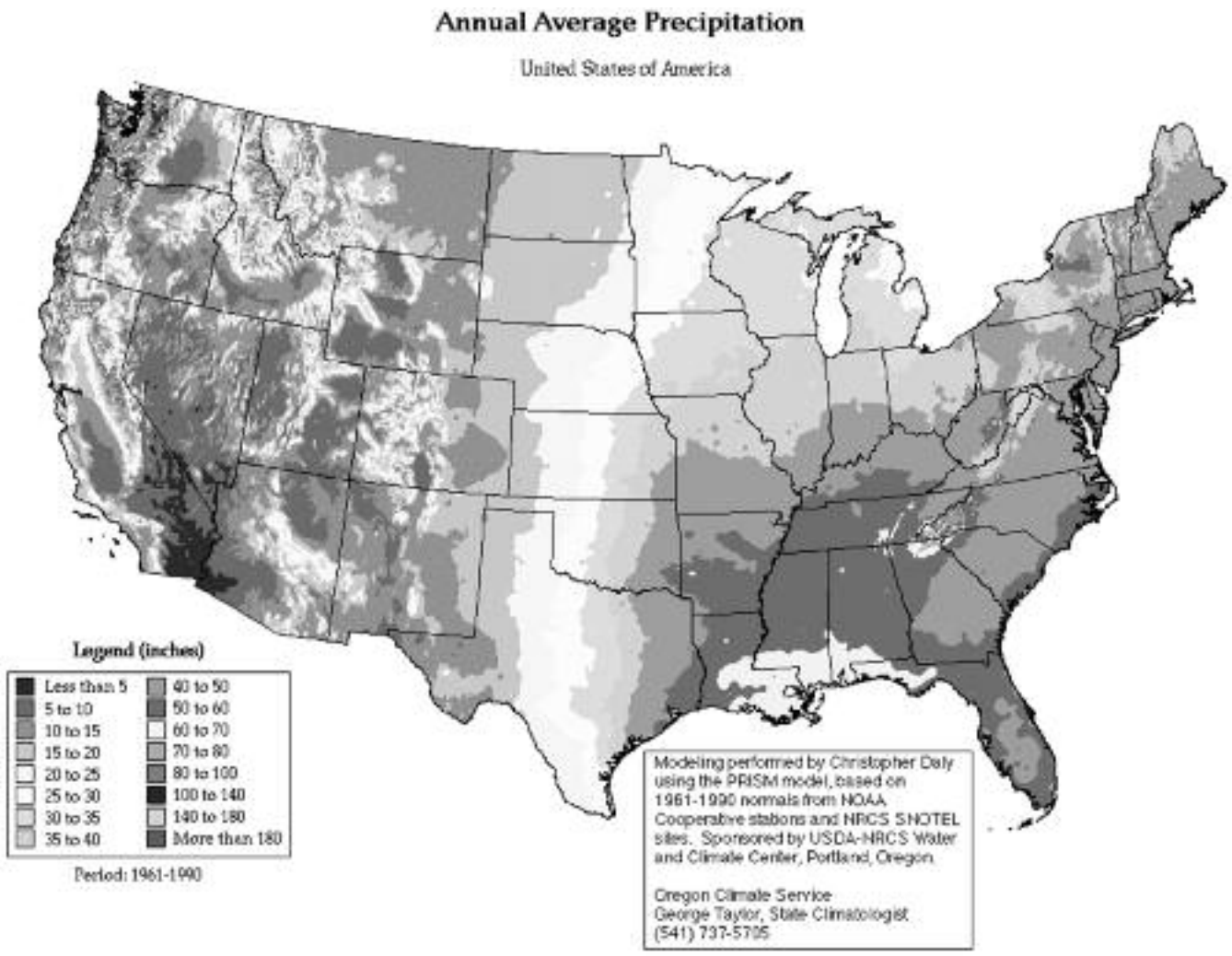

The prospect of losing control of its water under free-trade or other agreements is something Canadians seem to worry about constantly. In 2007, Canada's House of Commons voted 134 to 108 in favor of a motion to recommend that its federal government "begin talks with its American and Mexican counterparts to exclude water from the scope of NAFTA."

Even Texas has clashed with its neighbors, Mexico and Oklahoma, over access to water. The roots of the Texas-Mexican water dispute go back to the 1944 water treaty which determined how flows from several river systems would be divided. Mexico violated the treaty from 1993 to 2002 by withholding the agreed upon water contributions to the Rio Grande. Texan farmers, ranchers, and irrigation district officials sued the Mexican government for $500 million in damages. Mexico finally made up its water debt in 2005. But many Texan farmers worry about the future as drought lingers throughout the region. In 2007, the Tarrant Region Water District, in the Dallas area, filed suit in the U.S. District Court for the Western District of Oklahoma naming the Oklahoma Water Resources Board and the Oklahoma Water Conservation Storage Commission. The Texas water district argued that a moratorium passed by the Oklahoma Legislature to bar the exportation of water to other states violated the federal commerce clause. The lawsuit seeks a restraining order to prevent Oklahoma from using the moratorium to block the sale of water to Texas. The suit argues that Oklahoma has allocated only 7.6 percent of the 34 million acre-feet of water that flows out of the state each year into the Red River and Arkansas River. One acre-foot, the volume of water that can cover an acre to a depth of one foot, is approximately 326,000 gallons.

The United States and Texas

The United States is divided approximately in half along the line of 95 degrees west longitude, where the eastern half generally has sufficient precipitation to meet current water demands. West of this line, precipitation is sparse and in many areas, insufficient to meet current demands. The shortfall in these areas is made up with groundwater withdrawals for agricultural and municipal uses.

The American West, like much of the world, is incurring a vast

From the Editor *continued on page 13*

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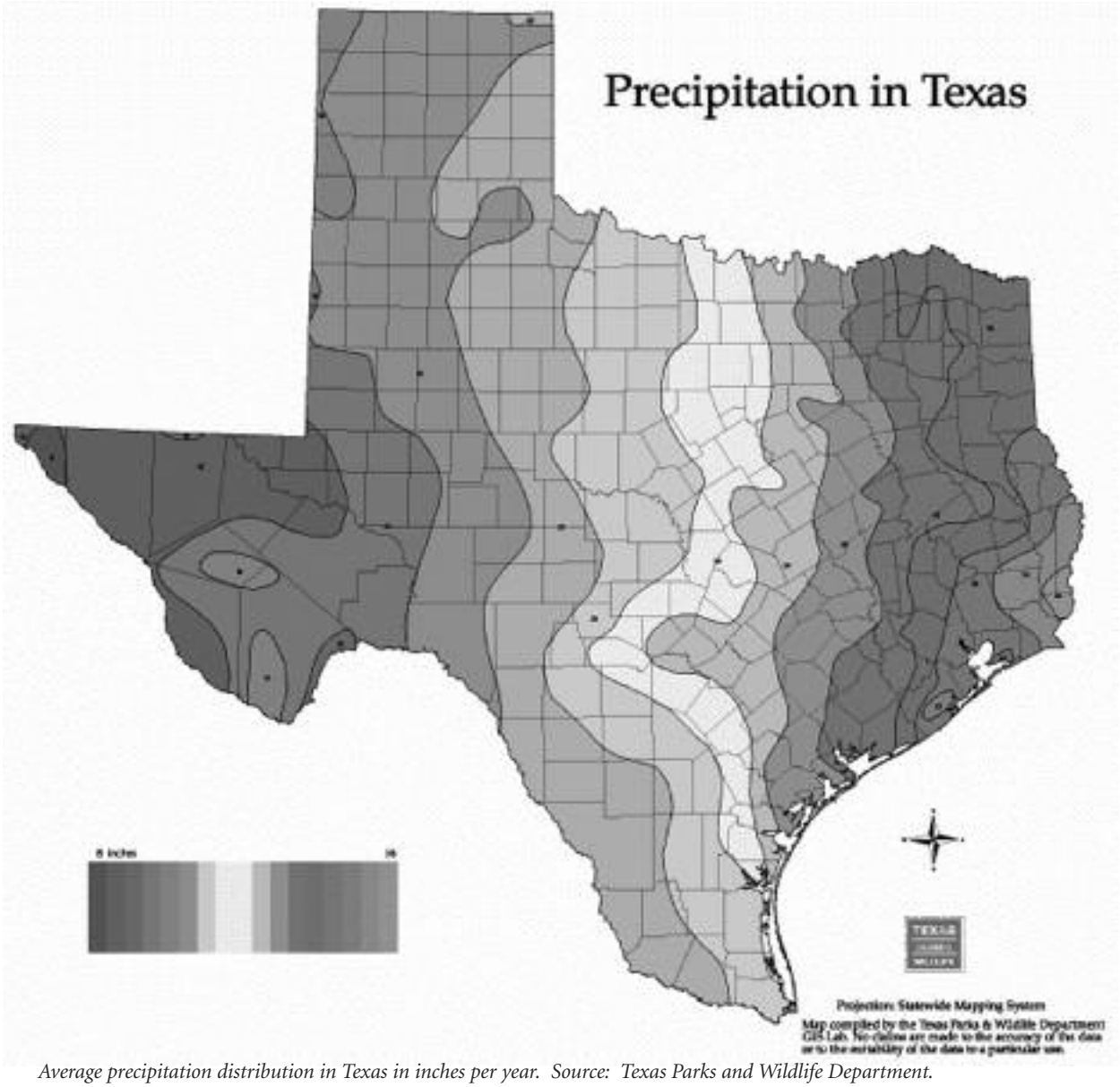
and growing water deficit that is hidden by the lush green golf courses carved into the desert scenery. To bridge the gap between demand and the over-allocated surface water supply, non-renewable groundwater aquifers are exploited. Since World War II, there has been a gold-rush type explosion of water extraction to support the agricultural 'Green Revolution' and thirsty cities.

Despite the warnings to Congress in 1888 by explorer and geologist John Wesley Powell that the lack of water was a serious obstacle to unbridled settlement of the West, large metropolises such as Las Vegas, Phoenix, and even Los Angeles have spread across the arid lands where rainfall is often less than ten inches per year. Only by political clout and the expenditure of billions of dollars on vast public works projects, transporting water across hundreds of miles blistering desert, are these cities able to exist. Children are taught that water flows down hill, but in the American West, as the saying goes, water flows uphill towards money.

La Vegas means "the meadows" in Spanish and was once a desert oasis with fresh water springs nourishing verdant grasses. Settlers on the journey west in the late 1800s stopped here to rest and water their livestock. The springs no longer flow and natural meadows are no longer found in Las Vegas due to the heavy draw on groundwater in southern Nevada to slake the thirst of the burgeoning population of Clark County. A new type of unnatural meadow, the irrigated lawn, is found throughout the region.

The Colorado River, the lifeblood of Southwest, is in serious trouble and no longer flows to the sea in most years. Seven states and dozens of Indian reservations, as well as Mexico, tap its flow.

From the Editor *continued on page 15*

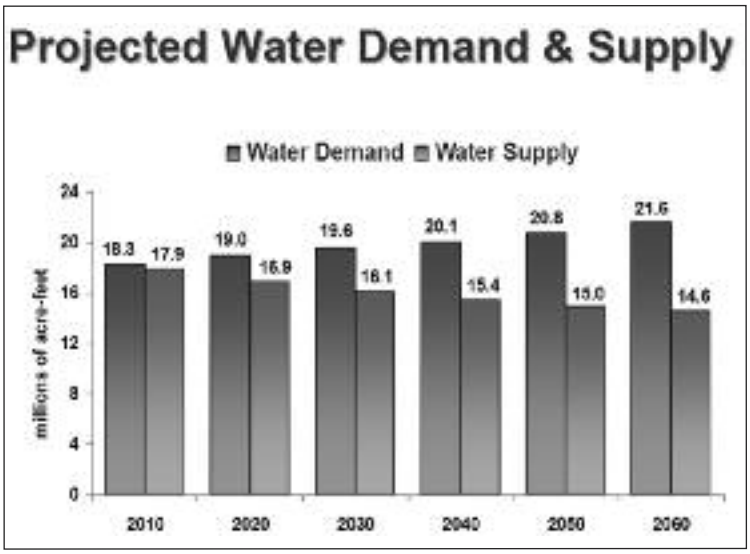


Average precipitation distribution in Texas in inches per year. Source: Texas Parks and Wildlife Department.

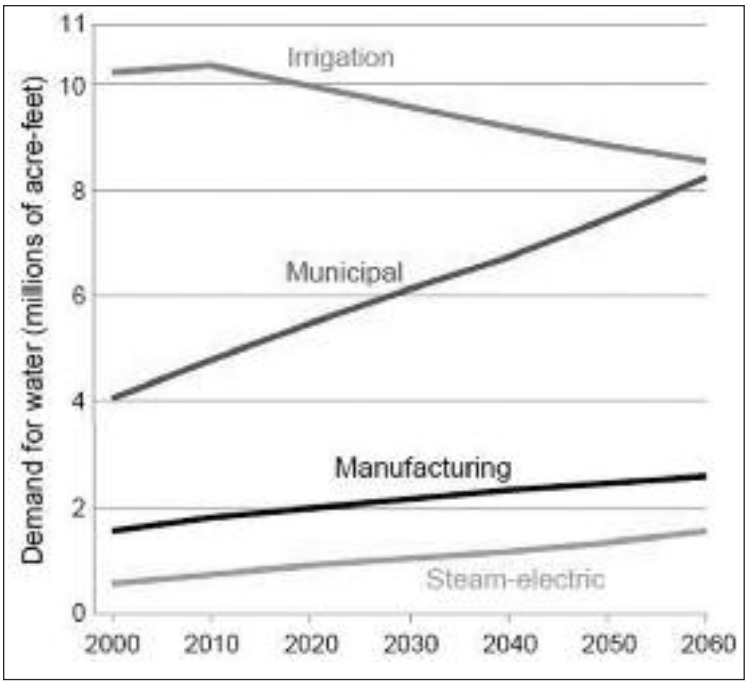
From the Editor continued from page 13

Development has sapped the river, a problem exacerbated by a drought called "perhaps the worst in 500 years" by United States interior secretary Gale Norton. Lake Mead, an immense reservoir that dams the Colorado to supply most of Phoenix's water, has a 50-50 chance of running dry by 2021, according to a study by the Scripps Institution of Oceanography.

Texas' situation mirrors that of the world and the Southwest. Its population is expected to nearly double by mid-century, from 20.8 million in 2000 to 39.6 million in 2050. Urban and rural centers have begun to clash over the allocation of water resources; in fact the growing municipal demand for water will be one of the greatest challenges facing Texas. The future living standard for Texans, particularly those in the arid western parts of the state, will depend largely on the availability and affordability of water.



Projected water demand and supply in Texas 2010 to 2060. Source: Texas Water Development Board



Projected water demand in Texas for irrigation, municipal, manufacturing, and steam-electric uses. Source: Texas Water Development Board

Texas lies at a crossroad of water resources in the United States with precipitation rates ranging from more than 55 inches annually in the Beaumont area to less than ten inches annually in El Paso. Texas water resources are sufficient to meet current demand of approximately 17 million acre-feet per year. However, growing water supply demands largely due to population growth and declining supply due to climate shifts may soon lead to deficits. The Texas Water Development Board (TWDB) forecasts that agricultural water usage will decrease over the next 50 years, but that this decrease will be offset by huge increases in municipal usage. The TWDB projects that overall water demand in Texas will outstrip supply by 2010 with the deficit increasing to seven million acre-feet per year by 2060.

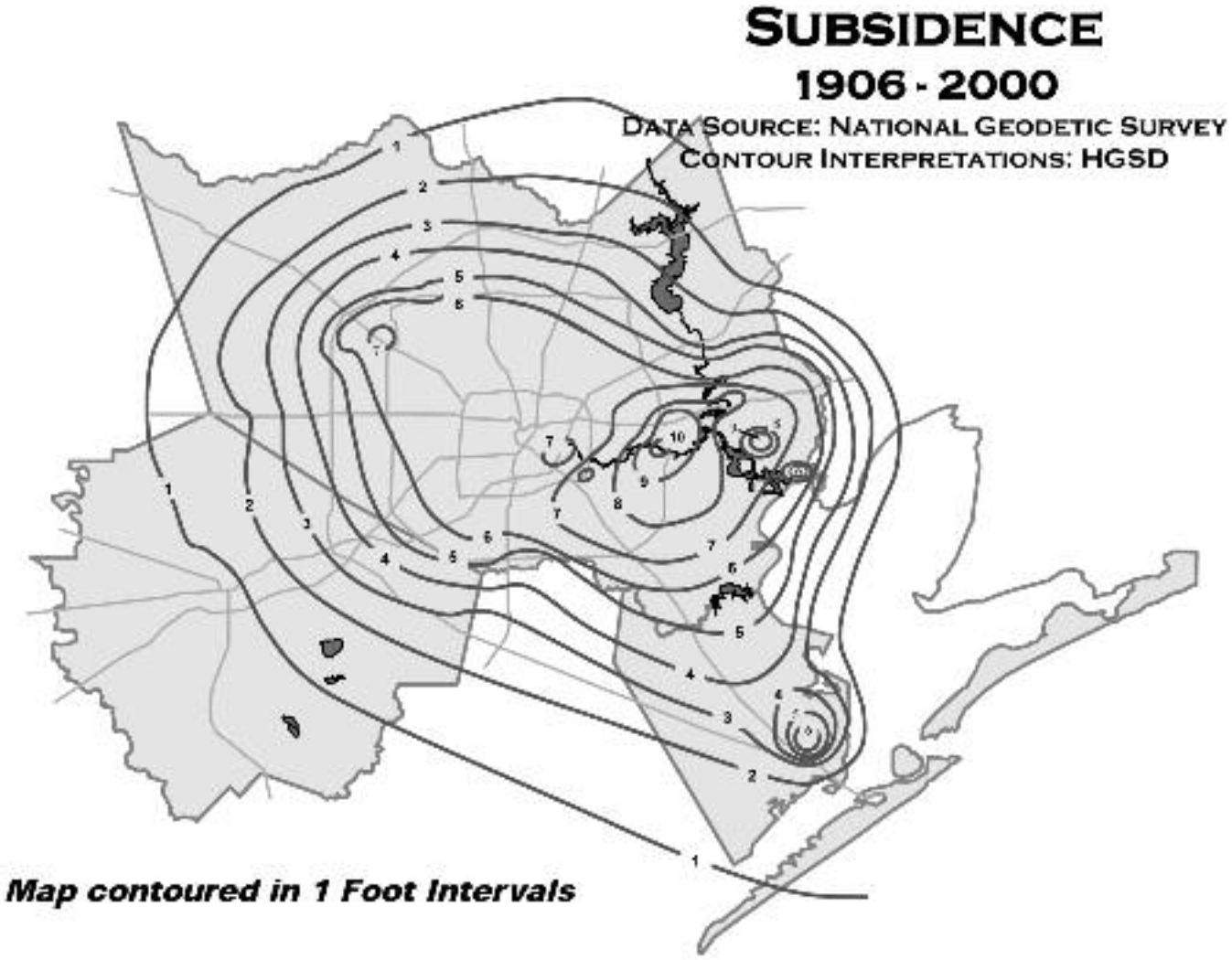
Houston water sources

In Houston, our water supply comes from both surface water and groundwater sources. Houston was fortunate to be founded in a location that overlies the Gulf Coast aquifer, and wedge of prolific water-bearing sediments more than 1000 feet thick in Harris County. Growth in Houston and the surrounding areas was greatly aided by the plentiful water drawn from the Gulf Coast aquifer. However, these large groundwater withdrawals came at a cost. Depressurization of the aquifer led to subsidence of the land surface. This subsidence was greatest in the areas east of Houston near the ship channel where ground elevations declined by more than ten feet. Several neighborhoods had to be abandoned due to the flooding that resulted from the subsidence.

In 1975, the Texas Legislature created the Harris-Galveston Subsidence District (HGSD), the first of its kind in the United States. Authorized as a regulatory agency and created to end subsidence, the district is armed with the power to restrict groundwater withdrawals. The district has developed and implemented a plan to shift the municipal water source from groundwater to surface water. As groundwter use has declined, water withdrawals from the Trinity River have increased to the point where it makes up more than 50 percent of the 900 million gallon per day demand.

From the Editor *continued on page17*

From the Editor continued from page 15



Source: Harris-Galveston Subsidence District (www.hgsubsidence.org)

Summary

Wise management and sustainable develop of the world's water resources is a task that has been postponed too long. Much of the world is in crisis and parts of the United States are rapidly approaching that point. Water-poor regions can no longer expect to put off addressing the problem by pumping ever greater amounts of relict groundwater from shrinking aquifers. Geoscientists should play a leading role in designing innovative solutions such as aquifer storage and recovery (ASR) where seasonally-surplus water supplies are banked in porous underground formations for later use.

So, the next time you open the faucet in your home and draw a glass of clean potable water, take a moment to consider the precious resource that you hold in your hand. Before you raise the water to your lips, think about how many times it has recycled through the atmosphere, earth, and ocean. And most importantly, reflect on how fortunate you are to have all you want. ■

Monday, May 11, 2009

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $28 Preregistered members; $35 non-members & walk-ups

To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

Lesli J. Wood, *Bureau of Economic Geology*
In collaboration with L. Moscardelli, R. Torres-Vargas, J. C. Bermúdez, G. López-Leyva, and D. Dunlap

Source-to-Sink Study of Shelf-to-Shelf Edge to Slope Depositional Systems and Reservoir Character in Offshore Eastern Mexico

Recent estimates of the hydrocarbon potential in eastern Mexico are approximately 55 billion barrels of oil equivalent (BOE) produced and 44.5 billion BOE in reserves. Comparatively, the U.S. Gulf of Mexico is estimated to have produced 138 billion BOE (plus proven) and that there are 73 billion BOE undiscovered. However, the U.S. Gulf of Mexico has over 1,300 producing fields, 42,000 producing wells offshore, and untold numbers of wells drilled. By contrast, the eastern Mexico regions of the Gulf of Mexico are underexplored, with vast regions of the shallow and deep water inadequately tested by exploration wells. This condition sets the stage for great opportunity in a variety of settings.

The Quantitative Clastics Laboratory at the University of Texas at Austin undertook a significant scientific research project to examine a large region (approximately 10,000 square kilometers) of the eastern offshore Mexico shelf and slope in partnership with Instituto Mexicano del Petroleo (IMP) and Petroleos Mexicanos (PEMEX) in hopes of applying ideas from seismic geomorphology to better understand the processes, sources, and sinks for sediments moving along the eastern Mexico margin. Some of the primary sedimentary systems examined included, shelf sands, shelf edge deltaic systems, slope systems, and mass transport prone systems and deposits.

Answering the questions of origin and nature of shelf-deposited isolated sandstone bodies has important implications due to their significance as worldwide hydrocarbon reservoirs.

Shelf Sands

Answering the questions of origin and nature of shelf-deposited isolated sandstone bodies has important implications due to their significance as worldwide hydrocarbon reservoirs. Increased knowledge can be brought to paleoclimatic and paleooceanographic models to increase the accuracy of infill drilling during exploration and development programs. Purported production increases of nearly 40% in some fields worldwide have been attributed to these models.

A seismic geomorphologic study was undertaken to examine some examples of shelf sands located in the eastern offshore Mexico. Logs from gas producing wells showed several cycles of stacked coarsening-upward sands and intervening heterogeneous shaley units. Horizons mapped with 3D seismic provide good stratigraphic control, although several large faults partition the shelf into individual producing blocks and thus complicate the region's seismic geomorphic analysis. Within blocks, seismic geomorphic images show that intervals characterized by higher log gamma ray response appear to contain channelized deposits, while those intervals characterized by lower gamma response in logs appear to contain bar forms. Bar forms are interpreted here to represent the **highstand** component of sequences. Mapped from plan form geomorphic images, these bars appear to be about 1000 to 2000 meters wide and more than 10 kilometers long, similar to those found today immediately offshore. Further seismic geomorphologic analysis shows that the intervals of bar development are separated by channelized intervals with both low sinuosity, 250-meter-wide channels trending perpendicular to relict bar orientations, and smaller, approximately 150- meter-wide, back barrier channels trending obliquely or parallel to swales formed by relict bars. These channelized intervals are finer-grained, based on gamma log interpretation (since they are likely draining back-barrier, mud-dominated regions), and are interpreted to represent the **lowstand** component of these cycles.

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This interpretation differs significantly from previous interpretations of these units but, nevertheless, is a plausible explanation of the occurrence of fine-grained channeling within this system. These units should be accounted for in production and development since they have the potential to form heterolithic production barriers and baffles.

Shelf Edge Deltas and Slope Deposits

Several large deltaic clinoform packages characterize the margin in the south half of the eastern shelf. In an attempt to assess the nature of these packages and how they may relate to reservoirs downslope, four key surfaces were mapped across an extensive area to isolate the individual primary packages (each containing multiple clinoforming events), and those surfaces were carried over the shelf-break and slope region into the easternmost extent of the data. This allowed us to assess the relationships between clinoform architecture and deep-water morphologies.

The shelf is characterized by a period of progradation and late-stage sediment bypass during a significant lowstand, followed by aggradation and limited downslope sedimentation.

The shelf is characterized by a period of progradation and late-stage sediment bypass during a significant lowstand, followed by aggradation and limited downslope sedimentation. The system filled the accommodation space at the shelf-break and downslope and became retrogradational, before a new phase of sedimentation at the shelf caused significant oversteepening and failure downslope. These later mass-transport deposits incised deeply into underlying deposits.

Shelf-edge faults exerted a strong influence on the location of deep-water fans. In addition, a deep-seated structural high in the easternmost regions of the study area influenced gravity deposits, forcing them around the high to the north until the feature was buried. Amplitude extractions through the lowermost fan interval (immediately overlying the lowstand surface) show a series of fans issuing from the gateways provided by the faults that splayed off the shelf. Smaller, approximately 200 meter-wide, channels can be seen as well as larger lobe developments that cross-cut one another.

Farther south, significant high amplitude debris flows can be imaged in older margins, buried among a myriad of channelized slope deposits.

Mass Transport Deposits

Significant volumes of mass transport material appear to have been shed from the southern Lankuasa shelf-edge of eastern offshore Mexico during the late Tertiary. A significant surface which bounds the base of this mass-transport complex-rich section has been mapped up onto the shelf and appears to separate a significant period of progradational clinoform development from a period of aggradational clinoform development. However, variations in clinoform architecture in the strike direction are still speculative and require more investigation prior to finalizing these interpretations. One obvious feature on the distal shelf is a large down-to-the-east normal fault that appears to curve westward marking the updip terminus of aggradational clinoform development. The fault obviously played a role in accommodation development and deposition of aggradational architecture, but its motion and planform view are rather enigmatic. The mass-transport complexes downslope from the shelf-break appear to be "shelf-attached" systems similar to those seen in other regions of the world (Moscardelli and Wood, 2006) and likely contain significant volumes of sandy material. A large canyon, which can be seen in the southern portions of the mapped survey, likely fed sediments directly eastward. A major failure occurred on the shelf-break, resulting in significant basinward dislocation of large clinoform packages. The failure is marked at the break by clinoform truncation, large, cuspate (cookie-bite) scars, and loss of significant volumes of upper slope sediments into eastern depocenters. Semblance images along the basal mass transport complex surface show dense cats-claw scours and major truncation of older, underlying upper slope and delta topset, foreset, and toeset architectural elements. Some of these "erosional remnants" may provide exploration opportunities. Cretaceous mass-transport deposits form the major reservoir in the Cantarell Field of offshore Mexico. Additional opportunities may lie in the final resting place for these Tertiary-age, sandy, shelf-attached mass transport complex deposits.

The deeper regions of this area are known as the Mexican Ridges. These gravity-failed systems of shale-cored, thrusted ridges form a bathymetry on the seafloor that enhanced the influence of current-driven processes in the region during the Tertiary and resulted in reworking and development of thick packages of contourites and sediment waves. In addition, gas hydrate occurs in very specific locations where deep faults feed gas to near-surface regions and state changes cause it to freeze into clathrates.

The development of several new plays such as those in the deep-water Wilcox Group, Tertiary carbonates in the deep Gulf of Mexico, and conventional mini-basin province of the Burgos Basin that bridges the transboundary regions between Mexico

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and the United States illustrate the importance of understanding the opportunities that lie south of the border. ■

Biographical Sketch

Dr. Lesli J. Wood is a Senior Research Scientist and Lecturer at the Bureau of Economic Geology at the University of Texas, Jackson School of Geosciences. She holds a Ph.D. from Colorado State University (1992), and an M.S. degree from the University of Arkansas (1988).

Dr. Wood has served as President of the Gulf Coast SEPM, national Secretary-Treasurer of SEPM, and SEPM Technical Chair for the 2002 AAPG/SEPM Conference. She is also a member of AAPG, GCSSEPM, GSA, and the Geological Society of Trinidad and Tobago.

She spent five years in industry with Amoco Production Company before moving to the University of Texas where she directs the Quantitative Clastics Laboratory Industrial Associates program. Her current research emphasizes education through research, with former students currently employed in academe, government, and industry around the world. Her research interests are in outcrop characterization of clastic reservoirs, studies of worldwide large deltaic systems, quantitative seismic geomorphology, shale diapirism and mobile shale basin development, the distribution and influence of gas hydrates on margin development, and the morphology of deltas on Mars. She has authored numerous papers on these subjects and presented hundreds of lectures and posters at society meetings, universities, and public venues.

Monday, May 18, 2009

Westchase Hilton • 9999 Westheimer
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Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

Carol Law
Exploration Manager East Africa
Anadarko Petroleum

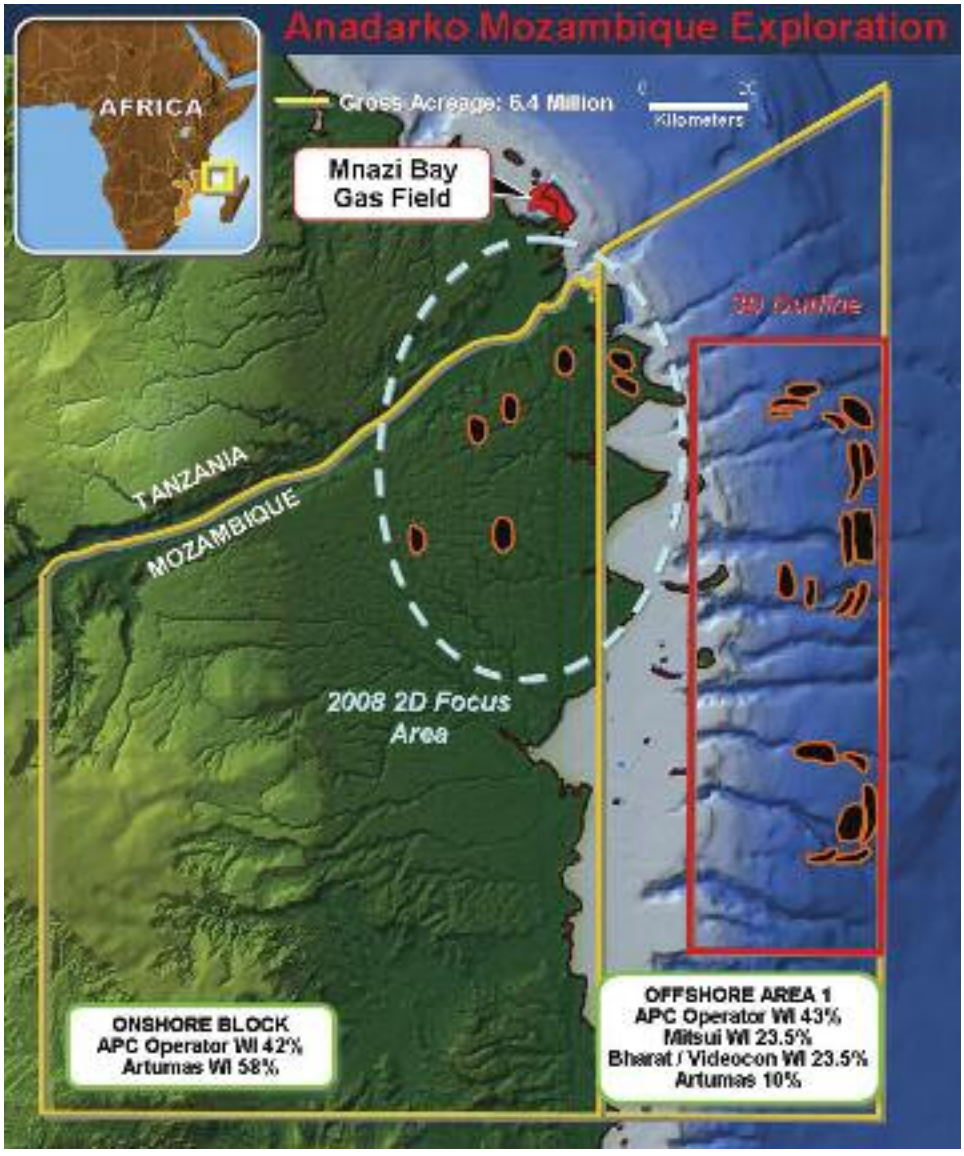
Northern Mozambique—True Wildcat Exploration in 2009

The petroleum systems of East Africa have gained a lot of attention in the last few years with most of the offshore area from the Mozambique Rovuma Basin north into Kenya being under contract by both large and small companies in hopes of finding the next big petroleum frontier. Hints of active petroleum systems can be seen in numerous hydrocarbon seeps along the coastal region. Recent exploration successes by Tullow Oil in the modern grabens of the East Africa Rift system of Uganda as well as the 2006 Mnazi Bay discoveries in southern Tanzania by the Artumas Group have given hope to those of the rest of us who are brave enough to venture there.

Anadarko Petroleum operates two concessions in the remote reaches of northern Mozambique: the Rovuma Offshore Area 1 and the Onshore Block. The Rovuma Basin contains one of the few largely unexplored Tertiary deltas in the world. The two concessions cover a combined area of approximately 25,822 square kilometers (about 6.38 million acres) along the border with Tanzania (Figure 1). Anadarko Petroleum is committed to an eight-well drilling campaign over the next three years: one onshore well, three shallow water wells, and four deepwater wells.

The stratigraphic section is composed of Permo-Triassic to Plio-Pleistocene-aged sediments in a variety of structural settings. Play types include Tertiary extensional regimes, complex fold and thrust belts, deep-water basin floor-fan stratigraphic traps, and Karoo horst blocks. Data in the concession areas are very limited. Available data are from one exploration well, approximately

HGS International Dinner *continued on page 27*



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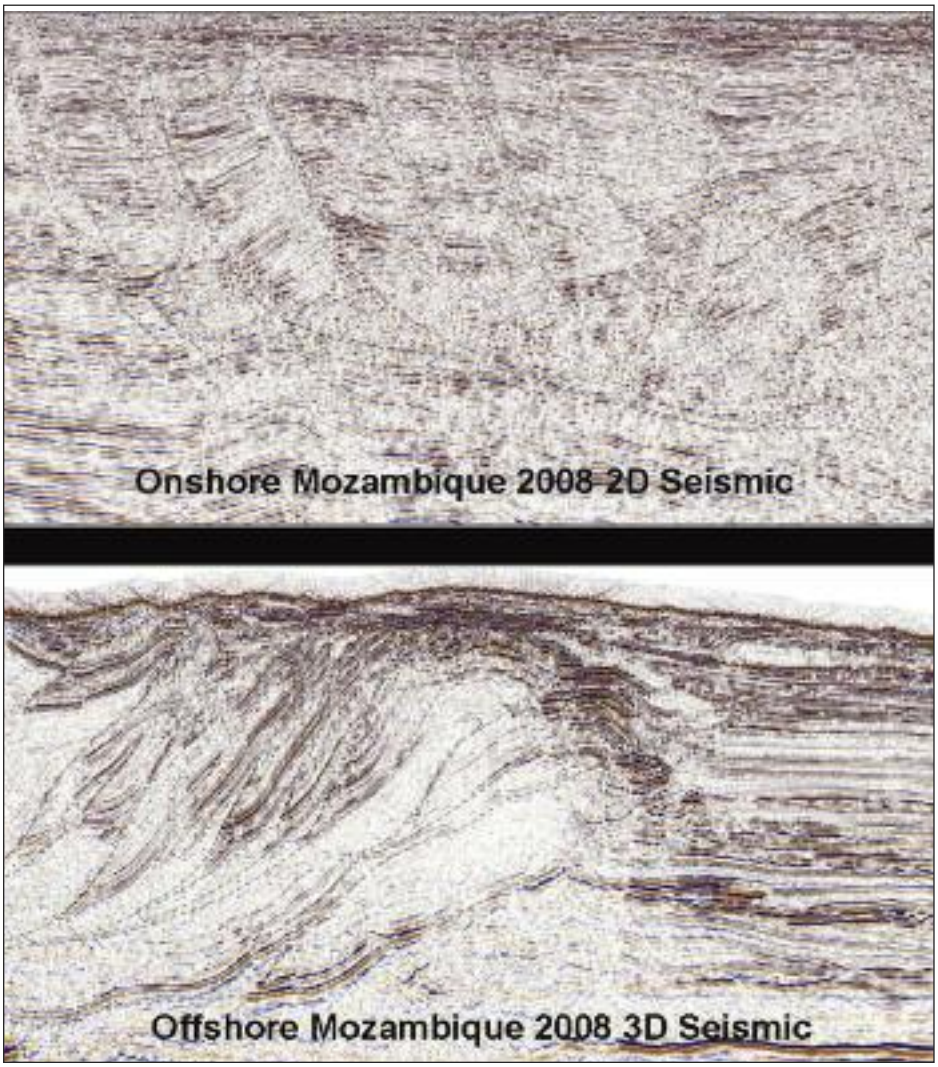


4,200 kilometers of vintage and recent 2-D seismic, and a 2008 proprietary 3,300 square-kilometer deep water 3-D seismic survey.

The Rovuma Basin is dominated by a Tertiary delta deposited on relatively undeformed Cretaceous and older sediments. It is a classic example of a linked extensional-contractional system. Early Tertiary to present-day deformation is interpreted to be in response to up-dip sediment loading and regional tilting above a master detachment in strata of late-Cretaceous to early Tertiary-age.

The recently acquired 3-D seismic data from offshore Area 1 reveal an area dominated by the complex interplay of two east–west trending fold and thrust belts that converge near the center of the 3-D survey area in coalescing strike-slip collapse systems. The northern and southern extents of the 3-D survey area are relatively undeformed. This permits an interpretation of sequence-stratigraphic depositional systems that can be carried into the structurally-complex portions of the concession block.

Play types include Tertiary extensional regimes, complex fold and thrust belts, deep-water basin floor-fan stratigraphic traps, and Karoo horst blocks.

The remoteness of the area adds a level of complexity rarely found in today's exploration concessions. Environmental concerns and lack of existing infrastructure have made this much more challenging than a conventional exploration opportunity. Some of the world's most pristine eco-tourism resorts are found on islands in the offshore area. The northernmost regions of Mozambique have been completely untouched by modern technology and conveniences that all of us are accustomed to.

Anadarko Petroleum and its partners are excited to be leading the hunt for "elephants" in remote northern Mozambique and are preparing to drill the first wells a wildcat program in late 2009 with our sights set on opening up a new frontier. ■

Biographical Sketch

Carol Law is currently the Exploration Manager for East Africa and the Caribbean at Anadarko Petroleum in The Woodlands, Texas. She has worked on international and Gulf of Mexico exploration projects for the past 25 years with several major and independent oil and gas companies. Her primary areas of technical expertise are petroleum systems modeling and geochemistry. She authored the "Evaluating Source Rocks" chapter of the American Association of Petroleum Geologists' treatise entitled *Handbook of Petroleum Geology – Exploring for Oil and Gas Traps.*

Tuesday, May 19, 2009

Crowne Plaza Hotel - Greenspoint (former Sofitel)
425 North Sam Houston Pkwy E

Social 11:15 AM, Luncheon 11:30 AM

Cost: $31 pre-registered members; $35 for non-members & walk-ups; Emeritus/Life/Honorary: $14; Students: FREE

To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

Bob A. Hardage
Senior Research Scientist
Bureau of Economic Geology,
Austin, Texas

Deepwater Hydrates in the Gulf of Mexico

Hydrates are found in shallow, near-seafloor sediments in most deep-water environments. The source of the hydrocarbon gases that form these hydrates can be biogenic or thermogenic in origin. In prolific hydrocarbon basins such as the Gulf of Mexico, thermogenic gases can make a significant contribution to deepwater hydrate systems, particularly when there are vertical permeability pathways for deep gases to migrate upward to the seafloor where pressure and temperature conditions are optimal for hydrate stability.

Chunks of gas hydrates recovered from the sea floor in the Gulf of Mexico in 2002. Photograph source: United States Geological Survey.

Scientists at the Bureau of Economic Geology have developed unique methods for studying deepwater hydrates across the Gulf of Mexico. In these studies, four-component ocean-bottom-cable (4C OBC) seismic data are used to produce high-resolution P-P and P-SV images of near-seafloor geology. The energy source used to generate the 4C OBC data is a standard air-gun array towed at a depth of a few meters. Although this system generates an illuminating wavefield with frequencies of less than 200 hertz, geological detail as small as one meter can be imaged using proper data-processing procedures.

This discussion will explain how hydrates are embedded in near-seafloor sediment, illustrate the nature of the hydrate targets that are to be imaged, show how high-resolution target imaging is achieved, describe how P-wave and S-wave seismic attributes are used to estimate hydrate concentration, and compare seismic estimates of hydrate concentration with estimates calculated from resistivity logs at calibration wells. ■

Biographical Sketch

Bob Hardage is Senior Research Scientist at the Bureau of Economic Geology and founder and Principal Investigator of the Exploration Geophysics Laboratory (EGL). EGL focuses on the development and application of multicomponent seismic technology. Before moving to the Bureau in 1991, Mr. Hardage was Exploration Manger for Asia/South America at Phillips Petroleum Company and Vice President of Marketing and Geophysical Development at Western Atlas. He has written three books on seismic topics, published numerous papers in technical journals, and teaches short courses and workshops at several venues each year. He is past Editor of *Geophysics*, writes the monthly "Geophysical Corner" column for the *AAPG Explorer* magazine, and is current First Vice-President of the SEG Executive Committee.

Tuesday, May19, 2009

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.

Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 non-members & walk-ups

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 (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

HGS Environmental & Engineering Dinner Meeting

Anton Rozsypal, P.E. and Paul Lewis, P.G.
Texas Commission on Environmental Quality

Recent Rule Changes to Chapter 350 (Texas Risk Reduction Program) and Chapter 334 (Underground and Aboveground Storage Tanks)

Mr. Lewis and Mr. Rozsypal will address the recent rule changes to the Texas Administrative Code Chapters 350 pertaining to the Texas Risk Reduction Program (TRRP) and Chapter 334 pertaining to Underground and Aboveground Storage Tanks. In response to legislation passed in 2007, the Texas Commission on Environmental Quality (TCEQ) has revised its rules by removing petroleum storage tank (PST) corrective action sites from TRRP rule requirements effective March 19, 2009. In response to federal law (The Energy Policy Act of 2005), the TCEQ has revised its Chapter 334 technical rules by adding secondary containment requirements for new underground storage tank (UST) construction effective January 1, 2009.

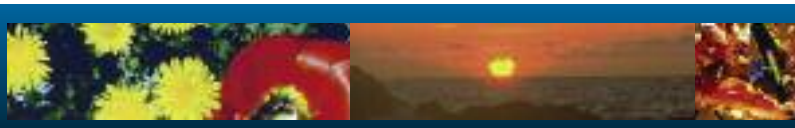
These rule changes will also result in changes to PST guidance. The TRRP Regulatory Guidance document RG-366 series has been undergoing revision to reflect the 2007 and 2009 amendments, corrections, and other updates. Several long-anticipated guidance documents are progressing in workgroups, including representative concentrations for human and ecological exposures and closure of waste management units. A related guidance document (RG-428), regarding preparation of drinking water survey reports, has been revised and will soon be re-issued. ■

Biographical Sketches

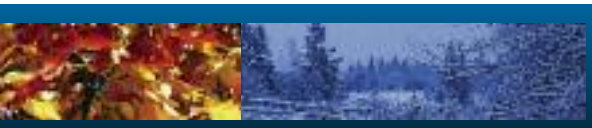
Anton Rozsypal holds a B.S. in agricultural engineering from Texas A&M University. He has been employed by the TCEQ and its predecessor agencies since April 1973 in the areas of Water Rights Adjudication (1973 - 1979), Dam Safety Hydraulics/ Hydrology (1979 - 1990), and Petroleum Storage Tank Regulation (1990 - present). Mr. Rozsypal is a registered Professional Engineer in the State of Texas and is currently the

HGS Environmental & Engineering Dinner *continued on page 35*

May 2009



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 .....$28 Nonmembers walk-ups..... $35 Env. & Eng.....$25 Luncheon Meeting .....$30 Nonmembers walk-ups..... $35 International Explorationists .....$28 North American Expl. .....$28 Emerging Technology $25
3	4 **2009 Offshore Technology Conference** *Reliant Park* *Houston, Texas*	5	6
10	11 **HGS General Dinner Meeting** *"Source-to-Sink Linkages between Clinoform Architecture and Deepwater Deposits, Eastern Mexico Margin, Southern Gulf of Mexico" Dr. Lesli J. Wood, Senior Research Scientist, Bureau of Economic Geology* Page 19	12 **TCEQ 2009 Environmental Trade Fair and Conference** *Austin Convention Center, Austin, Texas*	13
17	18 **HGS International Dinner Meeting** *"Northern Mozambique—True Wildcat Exploration in 2009"* *Carol Law, Exploration Manager East Africa, Anadarko Petroleum* Page 25	19 **HGS Northsiders Luncheon Meeting** *"Deepwater Hydrates in the Gulf of Mexico"* Page 29 **HGS E&E Dinner Meeting** *"Recent Rule Changes to Chapter 350 and Chapter 334" Page 30*	20
24 31	25 **HGS North American Explorationists Dinner Meeting** *"Mid-Tertiary Volcanism in the Gulf of Mexico Coastal Plains: Origin of the Catahoula Tuffs Reconsidered" John J. Morony* Page 37	26	27



GeoEvents

Thursday Friday Saturday

	1	2
7	8	9
14 **HGS Continuing Education** *"Reservoir Engineering Tools for Geoscientists"* *John R. Farina, Petroleum Engineer*	15 **HPAC Annual General Meeting and Luncheon** *Houston Racquet Club* Page 60	16
21 **SIPES Luncheon** *"Corpus Christi Bay - Another 3-D Success"* *Robert M. Rice, Principal Geologist, Royal Exploration Co., Inc.* *Petroleum Club* Page 41	22	23
28	29	30 **NOW you can make your reservations on-line at www.hgs.org**

Upcoming GeoEvents

June 7 – 10
AAPG Annual Convention
Denver, Colorado

June 20
9th Annual GSH / HGS Saltwater Tournament
Tackle Box Storage & Fish Spot Marina, Texas City

June 21 – 29
HGS Grand Canyon Field Trip

June 27
26th Annual HGS Skeet Shoot
Greater Houston Gun Club, Missouri City

July 17
SIPES Independent's Day Celebration
Shrimp Boil at Big Woodrow's

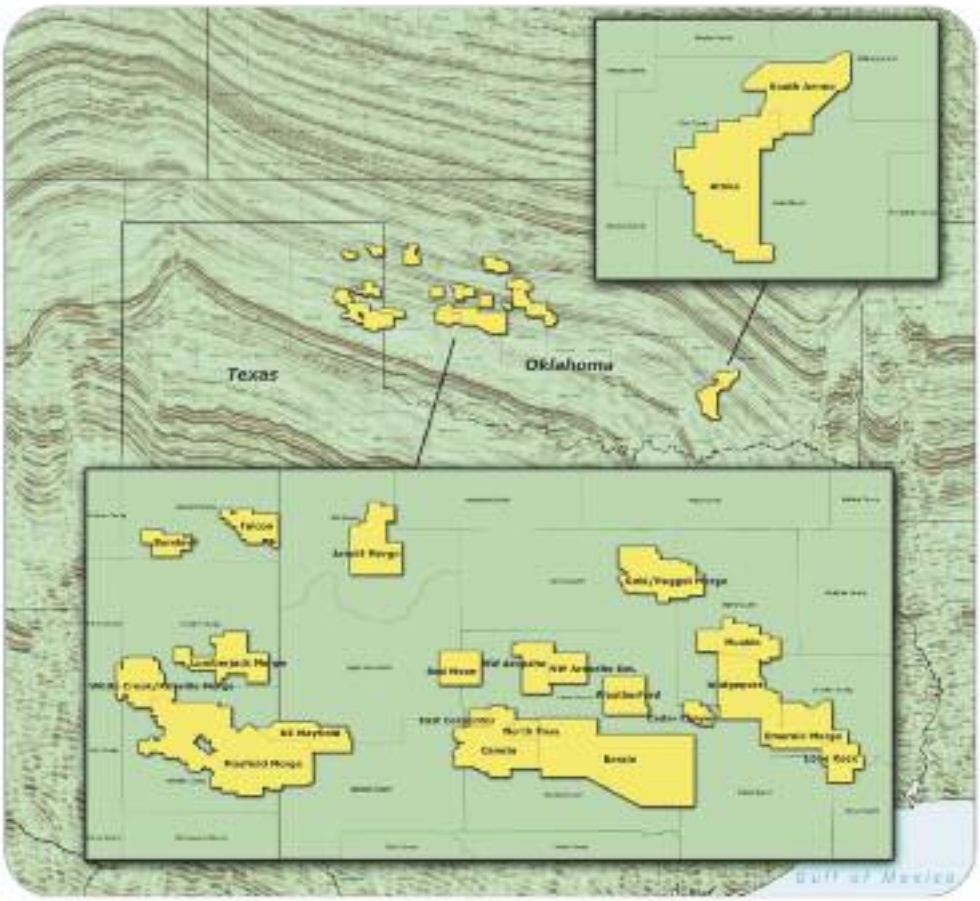
August 13
HGS Technofest

August 27 – 28
Summer NAPE Expo
Houston, Texas

September 9 – 10
PESGB / HGS Africa Conference 2009
London

September 27 -29
59th Annual GCAGS-GCSSEPM Convention
Shreveport, Louisiana

October 25–30
SEG International Exposition and 79th Annual Meeting
Houston, Texas



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Western US
Rick Trevino
+1 832 351 1051
rick.trevino@cggveritas.com

Mid-Continent
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dennis.langlois@cggveritas.com

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HGS Environmental & Engineering Dinner continued from page 30

Senior Engineer, the Technical Services Function Lead, and the Rules Liaison for the PST Reimbursement & Technical Services Section in the Remediation Division. Contact information: Telephone: 512/239-5755. E-mail: Arozsypa@tceq.state.tx.us

Paul Lewis graduated from Widener College with a B.S. degree in management in 1972. After two years of military service in Texas, he entered the University of Texas at Austin and completed an M.A. degree in geology in 1978. He joined the Texas Department of Water Resources in 1979. Duties with the TCEQ and predecessor agencies over the course of 30 years have varied between technical and management positions. His current assignment as a technical specialist in the Remediation Division includes developing guidance and training for the Texas Risk Reduction Program rule. He is a licensed professional geoscientist in Texas. Contact information: Telephone: (512) 239-2341. Email: Plewis@tceq.state.tx.us

Monday, May 25, 2009

HGS North American Explorationists Dinner Meeting

Westchase Hilton • 9999 Westheimer
Social Hour 5:30-6:30 p.m. • Dinner 6:30-7:30 p.m.
Cost: $28 pre-registered members; $35 for non-members & walk-ups; Emeritus/Life/Honorary: $14; Students: FREE

To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
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You may still walk up and pay at the door, if extra seats are available.

John J. Morony

Mid-Tertiary Volcanism in the Gulf of Mexico Coastal Plains: Origin of the Catahoula Tuffs Reconsidered

Pyroclastic surge deposit, Catahoula tuff, along US 281, 7.5 miles N of Three Rivers, Texas. Previously identified as an ash-fall originating from the Trans-Pecos and/or the Sierra Madre Occidental.

Chalk bluffs, McMullen County, Texas. These exposures are identified as the fragmented remains of ramparts of tuff rings; a consequence of hydrovolcanism. The prevailing opinion is that they are simply accumulation of reworked air-fall deposits that originated in the Sierra Madre Occidental.

The Oligocene Catahoula Formation is currently believed to be a product of exclusively exogenic processes principally fluvial in nature. All volcaniclastics of the Catahoula, of whatever age (Eocene to Miocene), size (fine ash to boulders), chemistry (basalt to rhyolite), variety (accretionary lapilli to mud flow tuffs), location (Mexico to Alabama) or magnitude of deposition (up to 1,000 feet thick), are assumed to be derived exclusively from a distant volcanic provenance: the Trans-Pecos or the Sierra Madre Occidental or both.

However, Thomas L. Bailey's long-forgotten 1924 hypothesis—that the Catahoula Formation is a consequence of local volcanism, and thus constitutes a volcanic terrain rather than a sedimentary formation, needs to be revisited. In 1977, a massive igneous intrusion was identified subjacent to Catahoula volcaniclastics in Live Oak and McMullen Counties, Texas where surface remains of tuff rings have recently been identified. These discoveries provide conclusive evidence of past endogenic forces in the region. Likewise,

HGS North American Dinner *continued on page 39*

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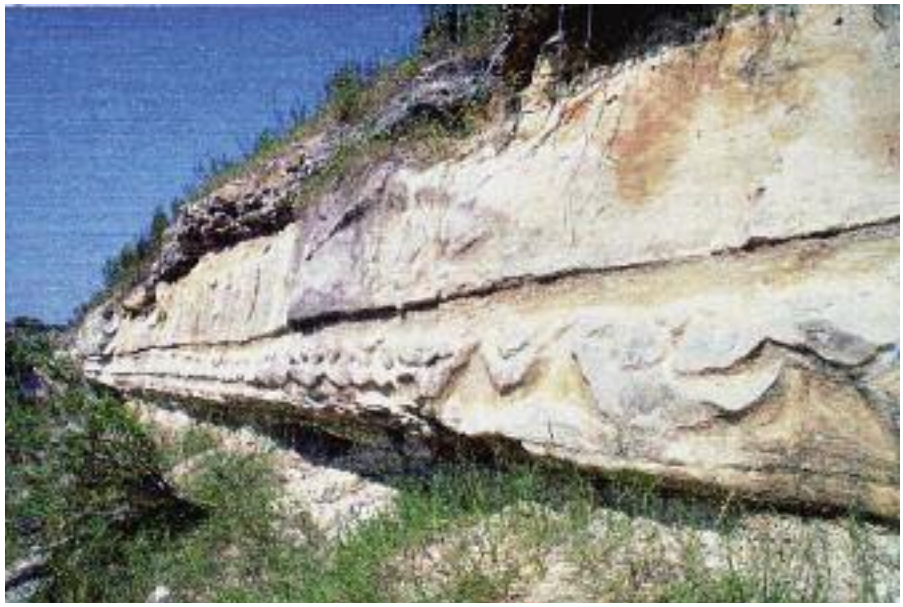
the igneous intrusion may be the heat source for the adjacent Wilcox geothermal corridor. Subsequent circulation of hydrothermal fluids accompanying hydrovolcanism provides a plausible explanation for the origins of the uranium deposits currently believed to have been ash-expressed from the Sierra Madre Occidental a thousand kilometers distant. The breeching of the basement rock is suggested to have been along the hinge line of the thick and thin transitional crusts in close proximity to the Stuart City Trend and coeval with and possible tectonically related to plate movements to the west and northwest.

Rejection of a valid scientific hypothesis, as presented by Bailey, coupled with non-recognition of the rules of parsimony (Occam's razor), customarily employed in scientific expositions, has obscured an understanding of the geology of the Gulf Coastal Plain. If the Catahoula volcaniclastics are other than local in origin one must ask—what is the geological evidence? ■

Biographical Sketch

John J. Morony earned a B.S. in biology from Texas A & M University in 1960 and an M.S. in biology from Louisiana State University, Baton Rouge in 1966. His earlier professional career was in association with the American Museum of Natural History in New York City, New York and the Museum of Natural Science, Louisiana State University, Baton Rouge. Both positions entailed collecting expeditions to the Neotropics. Mr. Morony also spent time at Columbia University, New York on grants devoted to avian anatomy and systematics.

As a consequence of extensive field work in the Neotropics, Mr. Morony became interested in potential influences of volcanism on biogeography. This necessitated a sound foundation in the fundamentals of geology. He attended a two-week field course on volcanism in 1994 taught by Michael Cummings, geologist at Portland State University, which served as a formal introduction into the subject. Mr. Morony conducted self-directed studies with much counseling from Kenneth Wohletz, geologist at Los Alamos and a leading authority on hydrovolcanism. Email: jmorony@sbcglobal.net.

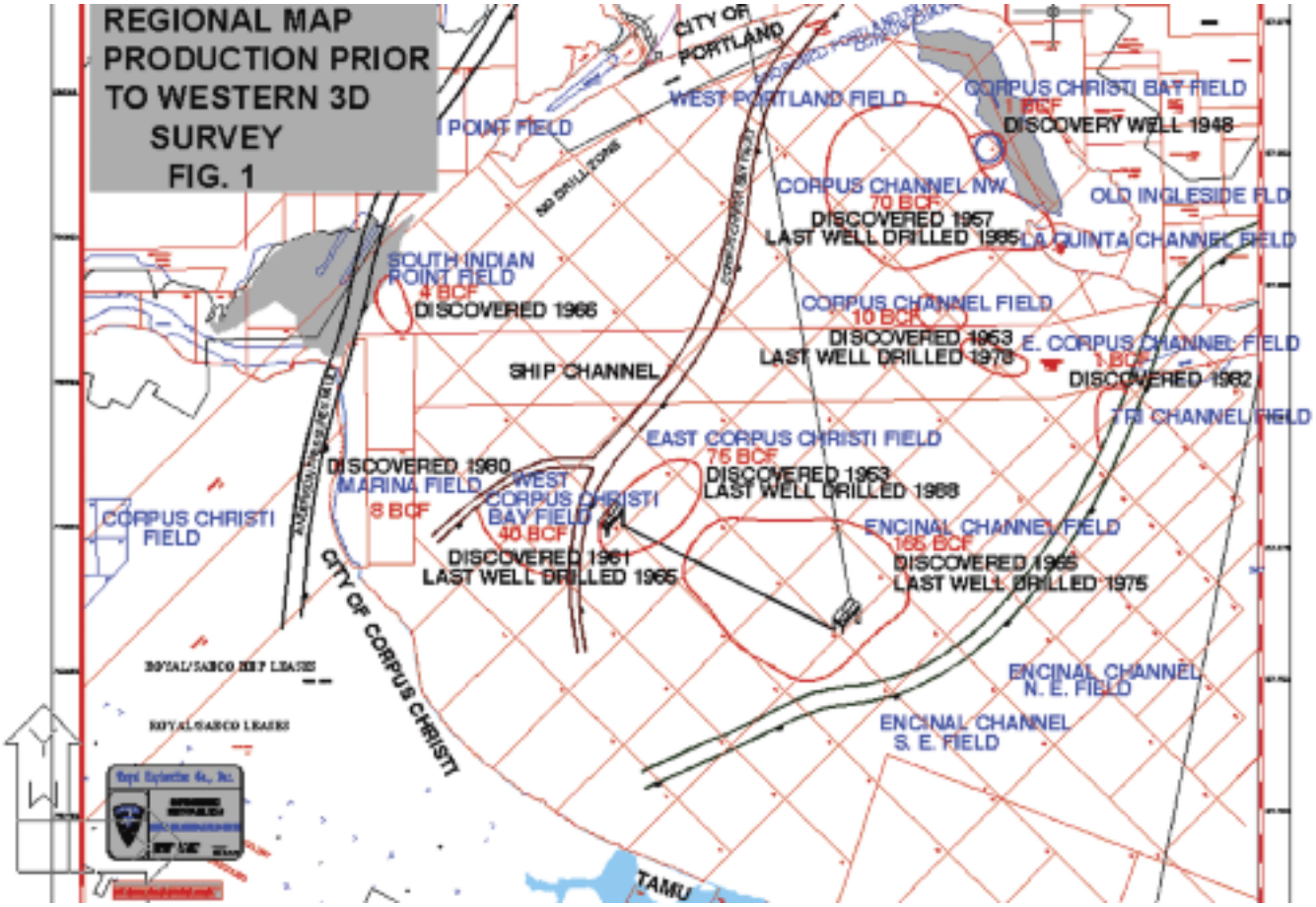


Walls of the Sickenious uranium quarry, Karnes County, Texas. Pyroclastic surge deposits in a marine environment surmounted by a bed of lignite subsequently subject to liquefaction. Subsidence was followed by additional marine deposits.

Ramparts of a tuff ring in the wall of the Stoelje uranium quarry, Karnes County, Texas. The lower bed is tuffaceous clay, interspersed with accretionary lapili that was wet at the time the next pyroclastic surge was deposited on top resulting in soft sediment deformation of both. "Hydroplastic slickenslide" can be found on the upper surface of the clay in response to gravitational instability resulting from syndepositional sliding or shifting of the upper bed. The high heat of the latter surge deposit served to bake the upper portion of the underlying tuffaceous clay.

SIPES Luncheon Meeting
Corpus Christi Bay - Another 3-D Success

Robert M. Rice, *Principal Geologist, Royal Exploration Co., Inc.*



Sabco Oil & Gas Corporation and Royal Oil & Gas Corporation formed a partnership in 1997 to exploit state leases in Corpus Christi Bay that were held for production by Sabco with the remnants of excellent Frio production discovered between 1952 and 1970. The partnership was consummated on the day that 80 square miles of Western Geophysical speculative 3-D seismic survey data in western Corpus Christi Bay were released. The partnership concentrated on two fields, East Corpus Christi and Encinal Channel, which are downthrown to a large growth fault that extends across the mid-section of the bay.

The two fields are located on a shale-cored ridge which is perpendicular to the growth fault. East Corpus Christi Field is closest to the fault. At the time the partnership was formed, it had produced 90 billion cubic feet (BCF) of gas from Upper Frio sands aged from *Marginulina* (approximately 6,000 feet subsea) through Nonion struma (approximately 9,000 feet subsea). The field is non-geopressured and structurally simple. The sands range from 20 to 50 feet thick with thin shale interbeds and, with the exception of the *Marginulina*, the trapping mechanism is thus anticlinal closure. Encinal Channel

SIPES Luncheon *continued on page 43*

Thursday, May21, 2009

Houston Petroleum Club in the Discovery Room, 800 Bell St. (downtown Houston). Social 11:15 AM, Luncheon 11:45 AM

Reservations Required: *Make reservations by telephone (713-651-1639), fax (713-951-9659), website (www.sipes-houston.org), or e-mail bkspee@aol.com to B. K. Starbuck-Buongiorno by 12:00 noon on Tuesday preceding the meeting. You can now sign up for the meeting online at www.sipes-houston.org, but payment is still required by regular mail or at the door.*

Cost: *$30 for SIPES Members and Chapter Affiliates who register by 12:00 Noon Tuesday; $35 for new registrations at the door. The price for guests, non-members and walk-ins is $35. No-shows will be billed.*

THIRD ANNOUNCEMENT
THE 8TH PESGB / HGS CONFERENCE ON AFRICAN E & P

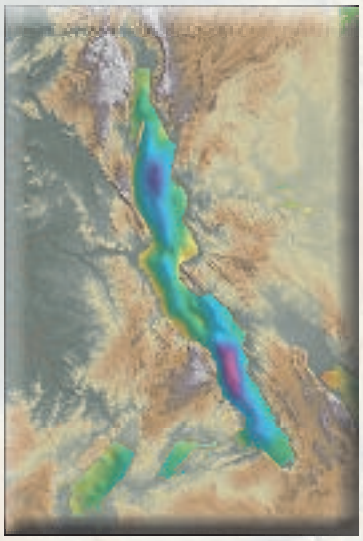
Africa: New Concepts for the Oldest Continent

QE II Conference Centre, London, 9 - 10 September 2009

Alternating between London and Houston, this annual conference has established itself as the primary technical E & P conference on Africa for Operators, Consultants, Governments and Academics.

Oral programme to include about 25 high quality presentations with an associated large poster display. A preliminary programme will be on the PESGB website from April onwards. A few poster slots may be available, please send abstracts asap to duncan.macgregor@neftex.com

Papers on this preliminary programme (subject to permissions) include: * Deepwater Plays in Gulf of Sirt (BP) * New Plays in Sirt Basin (Shell) * Ghana Discoveries (Kosmos) * Albert Basin (Tullow, Heritage) * South Atlantic Conjugate Margin and Turbidite Play Prediction Studies (Consultants) * New Plate Tectonic Models and Regional Tectonics (Academics) * East African Regional Petroleum Systems and New Plays *



Pre-Registration is now available at an Early Bird discounted rate of £250 for PESGB/HGS/Geol Soc. Members and £300 for Non-Members.

Please complete the Registration Form and return to the PESGB Office or register Online.

To book an Exhibition Booth please complete the Booth Application Form and return to the PESGB Office.

For Sponsorship Opportunities please contact Rebecca at the PESGB Office on 020 7408 2000 or email rebecca@pesgb.org.uk.

Early Sponsors

GLOBAL EXPLORATION SERVICES

MacGeology

SASOL

Image courtesy of Fugro NPA and Surestream Petroleum : Lake Tanganyika, Neogene rift basin exploiting Permian rift trends and PanAfrican lineaments, composite topographic and satellite gravity image

PESGB

2009 Conference Committee: Ray Bate (Chairman), Duncan MacGregor & Richard Dixon (Technical Co-ordinators), Kevin Dale (London) and Al Danforth and Ian Poyntz (HGS, Houston).

SIPES Luncheon continued from page 41

The thicker shales provide the seal for the upthrown fault closures and, when combined with the complex fault pattern, are ideal candidates for 3-D seismic surveys.

Field is southeast of East Corpus Christi Field and becomes the dominant structural feature with depth, starting at approximately 9,000 feet subsea at the base of the Upper Frio *Nonion struma* section and producing down to the Middle Frio *Discorbis* "D" at approximately 12,500 feet subsea. The East Corpus Christi Field has produced in excess of 150 BCF of gas with most of the sands being geopressured and faulting becoming increasingly complex with depth. The sands vary from 20 to 150 feet in gross thickness with the shale intervals being much more abundant and thicker than at East Corpus Christi Field. The thicker shales provide the seal for the upthrown fault closures and, when combined with the complex fault pattern, are ideal candidates for 3-D seismic surveys.

The entire two-field complex was discovered and exploited prior to the advent of high quality 2-D seismic data, leaving a prospect with "major-league" reserves and no modern seismic data. Encinal Channel Field also had a key well, the Gulf #2 State Tract 48, which had produced 2.6 BCF of gas from the Middle Frio M-4 Sand at 10,586 feet subsea prior to watering out. The well had a water contact that, by subsurface control was known to be 300 feet low to the top of the structure. There appeared to be 700 acres of unproduced prospective area between this well and the next highest producing well. The 3-D seismic data interpretation confirmed the existence of several fault blocks in the 700-acre target area. The Sabco/Royal partnership drilled these fault blocks first, followed by fault blocks identified using 3-D seismic data, eventually drilling 17 successful wells and 3 dry holes. This drilling program resulted in peak production of 60 million cubic feet per day of gas and additional cumulative production to date of approximately 100 BCFE. In early 2009, gas production was still 15 million cubic feet per day. Production in Corpus Christi Bay was thus brought back to life and can be added to the long list of 3-D success stories. ■

SIPES Luncheon *continued on page 47*

Earth Science World
www.earthscienceworld.org

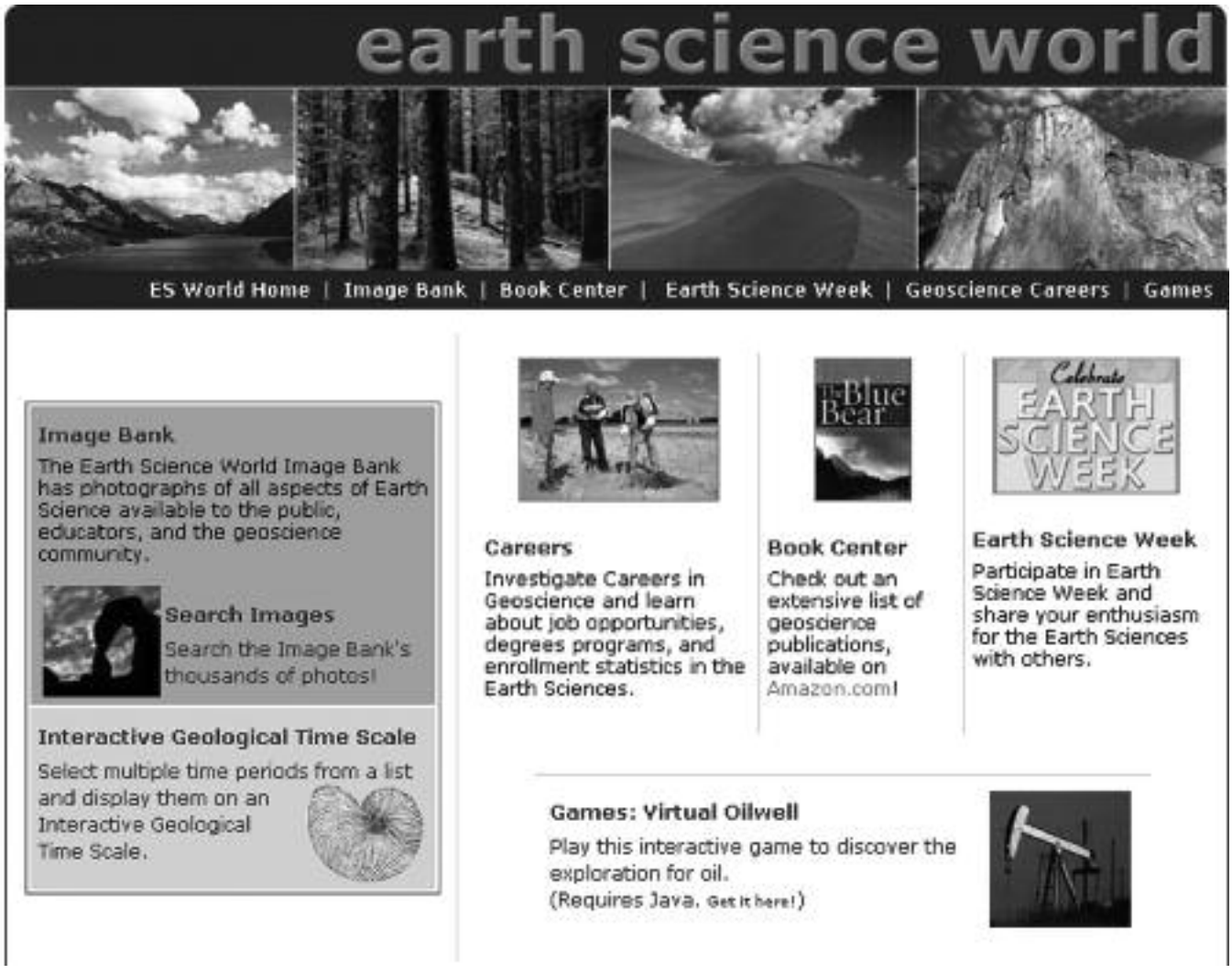
Michael F. Forlenza, P.G.

The Earth Science World website calls itself the "Gateway to the Geosciences." The homepage has a clean look with large white areas and no advertisements. The homepage banner has bold graphics, four photographs of geologic features, and links to the five primary subject areas of the website. The content on the homepage is lean with only a few images and clickable links in the body that mostly duplicate the links in the banner. At the bottom of the homepage are some additional links that connect to the parent American Geological Institute website and related webpages.

The American Geological Institute (AGI), based in Alexandria, Virginia, is a nonprofit federation of 45 geoscientific and professional associations that represents more than 120,000 geologists, geophysicists, and other earth scientists. Among the member societies are the American Association of Petroleum Geologists, the American Institute of Professional Geologists, the Association of Environmental & Engineering Geologists, and the Society of Exploration Geophysicists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice of shared interests in the profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in the use of resources, mitigation of natural hazards, and the health of the environment. The website states that Earth Science World is a service of AGI and a place to explore interests in the earth sciences.

The five main links from the homepage are Book Center, Image Bank, Earth Science Week, Geoscience Careers, and Games. During the preparation of this article, the webpage for the Book Center was unavailable but visitors were asked to "check back

Geologic Website of the Month *continued on page 46*



Geologic Website of the Month continued from page 45

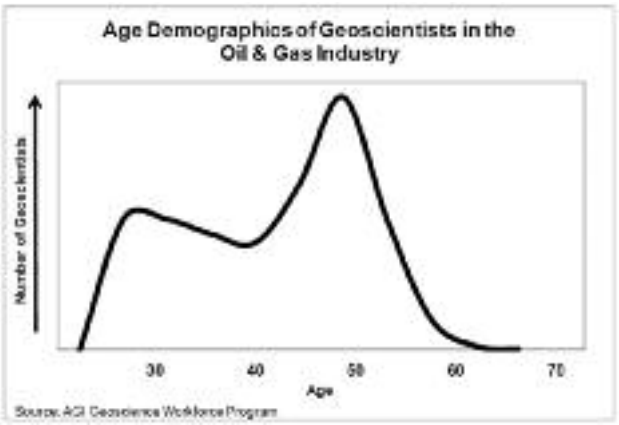
soon." The Image Bank, designed to provide quality geoscience images to the public, educators, and the geoscience community, is fairly impressive. With over 6,000 geology-related photographs and diagrams, it is one of the largest sources of earth science imagery available on the Internet. Sophisticated search functions allow the visitor to browse the archive of images by category, by geologic feature, by location, or by keywords. A new feature also allows searching by geographic coordinates.

The Earth Science Week link opens the www.earthsciweek.org website which has a similar appearance to the Earth Science World website. The Earth Science Week webpage has numerous links to features and resources related to annual activities surrounding Earth Science Week that is held in October to encourage people to explore the natural world and learn about the geosciences. These features and resources include a newsletter, teaching materials, class room activities, contests, information on scholarships and internships, photograph gallery, and a calendar of events.

The Geoscience Career link connects to the AGI geoscience workforce page. This page provides some useful information for students considering studies or careers in the geosciences. On the Data and Reports page are links to original reports pertaining to the career outlook for professionals in the geosciences. These AGI reports include the March 2009 "Effects of the Global Economic Crisis on Geoscience Departments" concerning the viability of academic programs and the "Status of the Geoscience Workforce Report" released in February 2009. This workforce report is a fascinating, extensively researched, and comprehensive evaluation of the geoscience profession. The workforce report is based on copious original data collected by the AGI as well as on data from existing sources such as federal agencies, professional organizations, and industry. The report synthesizes the available data and presents an examination of subjects ranging from the supply and training of new geoscience students, to workforce demographics and employment projections, to trends in geoscience research funding and economic indicators. The report is a worthwhile read to see where our profession is headed. And, for people who like graphs and bar charts, the report is a treasure. Also useful is the list of the links to the Related Sites page for geoscience societies and geosciences career-related websites.

This workforce report is a fascinating, extensively researched, and comprehensive evaluation of the geoscience profession…for people who like graphs and bar charts, the report is a treasure.

A text box on the Earth Science World homepage with a graphic of



a nautilus shell connects the visitor to and "Interactive Geologic Time Scale." This is a disappointing feature. After selecting a time period, a rather simple geologic time scale appears with the selected time interval slightly highlighted. In the age of stunning computer graphics, this is hardly an interactive feature.

Do not miss the Games section of the website. Clicking on Games in the banner or on photograph of the pump jack near the bottom of the homepage will open the virtual oil well interactive game. Running the game requires Java software which can be downloaded. The interactive virtual oil well game is the primary reason to visit the website to test your hydrocarbon exploration skills and your luck in the swamps of southern Louisiana. The game provides a back story: your late Aunt Thibodeaux purchased the mineral rights to an eight mile square of land where there is a good chance that oil can be found. She has also left you $2,000,000 and mineral rights to that land. You must use this inheritance to explore for gas or oil on that land.

Just as in non-virtual hydrocarbon exploration, everything costs money. Hiring consultants, shooting seismic, drilling, and well completions will cut into your aunt's stake so be sure to budget wisely. You can identify potential exploration targets after acquiring one, a few, or several seismic lines depending on how confident you feel about your target. As drilling progresses, you can review the mud logger's reports to decide whether to drill deeper or complete the well. Tension mounts as the drill bit encounters only brine-filled sands and your funds disappear. I will not provide any hints on where to look for the potential riches that may lie under that swamp land. But I will say that I drilled several dusters before making my fortune.

Overall, the content of the "Gateway to the Geosciences" is somewhat spare and the navigation somewhat quirky. It is sometimes difficult to tell that a link has opened a different website, from where, you cannot return to the homepage without using the Back button. Still, a visit to the Earth Science World website is worthwhile for the lovely image database, the recent and comprehensive reports on the geosciences profession, and the amusing interactive oil exploration game. ■

SIPES Luncheon *continued from page 41*

Biographical Sketch

Robert M. Rice has worked for over 30 years as a petroleum geologist. He began his career with Texaco in New Orleans where he worked for four years as an offshore geologist in the Gulf of Mexico. He moved to Corpus Christi, Texas to work the onshore Texas coast for Texas Oil and Gas and later for three family owned companies: Edwin L. Cox, Suemaur Exploration, and Royal Exploration Company. At Royal, he was the principal geologist for the Corpus Christi Bay project. He subsequently returned to offshore work and has been the principal geologist for Royal's Gulf of Mexico exploration program.

Mr. Rice graduated summa cum laude from Denison University with a B.S. degree in geology and earned an M.S. degree in geology from the University of Southern California.

High Island Field Trip 2009

Earth Science Week had a Mammoth Field Trip to High Island

Martha McRae

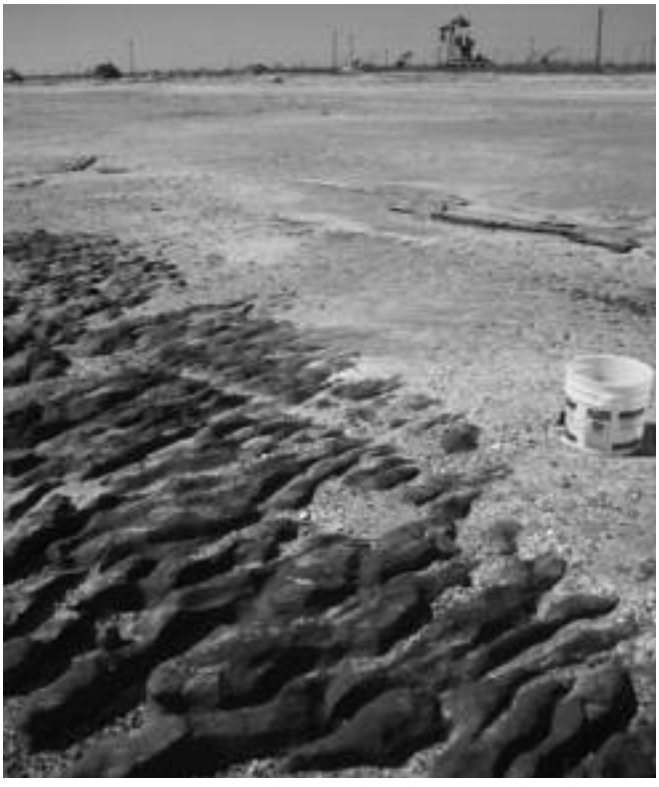
On February 22, 2009, members of Houston Geological Society and Houston Gem and Mineral Society (HGMS) put together Earth Science Week's free, public High Island field trip. The trip, which was originally scheduled for October 2008, had been cancelled due to Hurricane Ike. More than 50 people joined the trip, including HGS members, HGMS members, professors, instructors, students, and interested families. We had strong participation from three local universities: College of the Mainland, Lamar University, and St. Thomas University. Participants learned about the local salt domes, hydrocarbon production in the area, beach and storm processes, the aftermath of Hurricane Ike, and the big activity of the day, collecting Pleistocene fossils from the Beaumont Formation. Most of the sand dunes had been cleaned off the beach by Hurricane Ike, exposing large expanses of the Beaumont shale. With the north wind blowing the water out and the low tide, the conditions were perfect for finding the 2 to10-million year-old bison and mammoth bones exposed near the beach front.

After setting up base camp on the beach where Highway 87 and Highway 124 intersect just south of the small town of High Island, we had group discussions about the salt domes and hydrocarbon production in the area. Several subsurface maps and cross-sections described the hydrocarbon traps and structure. Neal Immega brought a sample piece of core from the High Island field showing the cap rock with sulfur deposits. We could look across the highway and see the ring of pump jacks that surround the small town of High Island that sits atop the salt dome. High Island is the highest point on the upper Texas gulf coast at a little more than 40 feet above sea level. We all agreed that it still was not a place we would want to be during a storm.

Dr. Donald Owen of Lamar University brought a composite aerial photograph of a large section of Bolivar Peninsula showing Hurricane Ike's effects on the shoreline. We discussed the obvious washover channels cut into the landscape and talked about the channel fan deposits on the beach side. These were created when the water from the storm surge started draining back seaward. We could not help but notice also the destruction to homes and property done by the storm. We looked at the USGS website aerial photographs from before and after the storm. The photographs showed that dune material was eroded from the beach and was then deposited in the lagoon.

With most of the sand dunes gone, it was easy to drive along the beach and see the exposed Beaumont Formation. The salt diapir has pushed up the underlying layers of rock and exposed the Pleistocene Beaumont shale for several miles along this beach. The dark brown mud is very different from the typical beach sand seen on Galveston Island and the Bolivar Peninsula. This

High Island Field Trip 2009 *continued on page 51*



Beaumont Formation in the foreground and a pump jack in the background

Bison tooth

High Island Field Trip 2009 continued from page 49

Group presentation

Horse tooth and bison bone

Worm burrows

Mammoth tooth upclose

Mammoth Tooth and Joe Coker

mud contains well-preserved bison and mammoth teeth and bones. After a brief introduction of what to look for, everyone headed out with buckets and shovels and went fossil-hunting along the beach. Some of the early arrivals that morning had started looking for fossils before we got there and had found a whole bison leg bone. That, of course, got everyone excited. While not nearly as exciting, fossilized worm burrows and iron oxide concretions were very common. After about three hours, the die-hard collectors came wandering back to base camp with some real prizes to share and identify. Several bison leg bone fragments were found as well as a four-inch-long horse tooth and a well-preserved, nearly intact bison tooth. The big find of the day was a mammoth tooth weighing around eight pounds that was found by Joe Coker right at the shoreline about two miles down the beach from base camp.

As in most successful and fun geology field trips, the day was filled with many impromptu discussions, ranging from possible causes for the massive destruction of property behind the geotube (sand-filled fabric tube used as a barrier for dune protection), to the best way to recognize a fossilized worm burrow and not recent dog poop without picking it up. We could not have asked for better weather: calm north wind and clear blue skies with temperatures reaching the low 70s. All in all, this was a wonderful trip filled with great hands-on geology and some pretty fantastic fossil finds. And just think, all of this is right in our own "back yard." ■

Technofest is Back!

Westin Galleria—August 13, 2009—2:00p–8:30p

A few years back, the Houston Geological Society came up with an idea for a summertime event that would gather the best of new technologies and a crowd of interested geoscientists. That event was Technofest! Originally held at the Westchase Hilton, it was an instant hit. As such, it maxed out the parking, air-conditioning and space at the Hilton.

Now Technofest is to be held in the Westin Galleria. The Woodway Hall at the Westin is over 21,000 square feet of carpeted, air-conditioned space just waiting for Vendors, Companies and Deal Sellers to share their information! In addition, because it is part of the Galleria, there are 8500 FREE parking spaces in close proximity.

There is going to be 58 - 10' x 10' spaces. Booth rental is only $400 and includes two admissions to the event. Ticket prices for the event are $10 for HGS Members and $15 for non-members, and will be the same at the door. The admission also includes one free drink ticket! We are anticipating booth spaces will sell out quickly – so it is first come-first served! A layout plan is included in this Bulletin. Vendors are allowed to set up between 8:00a and Noon, and tear-down will be after 8:30p to 11:00p.

Of course Sponsorship opportunities are available for food and beverages. This year we have lowered the cost of sponsorship so that more companies can participate and it won't hurt the pocketbook as much! Sponsorships can be made at the PLATINUM LEVEL - $1000, GOLD LEVEL - $500, SILVER LEVEL - $250 AND BRONZE LEVEL - $100. Sponsors will be give top billing at all refreshment stations and in the registration area of the Woodway Hall. Finger foods and cash bars will be scattered around the Hall, so there should be no long lines! There is also an opportunity for a Sponsor to host the Popcorn Machine. They could have their logos or names on the popcorn bags! The cost for the Popcorn Sponsorship is approximately $1000 (rental and popcorn – does not include bag printing).

Also needed are volunteers! The HGS is expecting a huge turnout for this event, and help will be needed with registration and vendor setup. Volunteers get free admission!

For more information, please contact Deborah Sacrey at 713-468-3260 or dsacrey@auburnenergy.com. Other members of the committee are Bonnie Milne – bonnie.milne@swiftenergy.com and Jim Grubb – jamesmgrubb@yahoo.com

CALLING ALL VENDORS!

HGS Technofest-2009

Thursday, August 13th, 2009
Vendor setup starts at 8:00a

Technofest is from 2:30p-8:30p

Sponsorship opportunities available!

If you have software/hardware to show – or if you want to get a jump on Summer NAPE!

We have booth space for you at the Westin Galleria!

21,000 square feet of space, with 8500 FREE Parking spaces!

Call/email Deborah Sacrey for information at 713-468-3260 or dsacrey@auburnenergy.com

Government Update

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

The Government Update provides information on rules, regulations, policy, and meetings of interest to professional geoscientists. If you would like the most up-to-date information, refer to the HGS website to review the Wise Report. *The* Wise Report *is posted as needed, but not more often than once a week.*

AGI Government Affairs Monthly Review (February 2009)

Economic Stimulus Contains Support for Geoscience

On February 13, 2009, Congress passed H.R. 1, the American Recovery and Reinvestment Bill of 2009, and President Obama signed it into law on February 17. The law allocates $787 billion in supplemental appropriations, tax credits, tax cuts, and other measures over a one to two year period. The goal of the law is to create and save 3.5 million jobs, provide tax cuts to 95% of American workers, invest in infrastructure, restore science and innovation as integral parts of solving societal issues, and rapidly invest to revive a struggling economy. No House Republicans supported the bill and only three Senate Republicans voted for it.

Within H.R. 1, significant funding is designated for science, technology, and infrastructure. Geoscience-related federal agencies receiving supplemental appropriations include the Department of Energy ($23.1 billion), the Environmental Protection Agency ($7.2 billion), the U.S. Army Corps of Engineers ($4.6 billion), the National Science Foundation ($3 billion), the National Aeronautics and Space Administration ($1 billion), the National Oceanic and Atmospheric Administration ($836 million), the National Institute of Standards and Technology (NIST) and the U.S. Geological Survey ($140 million).

Federal agencies are now in the process of writing out plans for spending the supplemental appropriations and sending these plans to Congress for approval. Although agencies have 60 days to submit plans, many are likely to submit their plans sooner so they can get the funds distributed and move projects forward. In many cases, Congress worked with agencies on the bill beforehand and has provided funding for projects that were ready to go.

National Science Foundation Director Arden Bement released a statement that said, "The $3 billion provided to NSF will go directly into the hands of the nation's best and brightest researchers at the forefront of promising discoveries, to deserving graduate students at the start of their careers, and to developing advanced scientific tools and infrastructure that will be broadly available to the research community."

New Energy Secretary Steven Chu announced a special team to conduct a complete restructuring of the dispersal of direct loans, loan guarantees, and funding in the stimulus. Visit agency web sites or contact agency officials for more details.

New Interior Secretary Ken Salazar is concerned that he does not have enough upper-level positions filled to deal with the $3 billion stimulus given to his department. Nonetheless, each major office and service has identified a prioritized list of projects that are ready to go. For example, the National Park Service identified $9 billion worth of projects that are backlogged only because of insufficient funds. Concerns remain that some projects might be delayed by National Environmental Policy Act (NEPA) reviews.

More details about geoscience-related supplemental appropriations are available from an AGI Special Update at: http://www.agiweb.org/gap/legis111/update_stim0209.html

The full text of H.R. 1 can be found at: http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.0001:

For information about how the funds are being used, timelines for reporting spending, and other details, see www.recovery.gov

Congress Considers Tougher Measures for Coal Ash Pit Disposal

The December 2008 spill of 5.4 million cubic yards of coal ash sludge into residential areas and the Emory River near Kingston, Tennessee after a break in a containment pond wall prompted Congress to consider modifying current coal ash disposal regulations. The Coal Ash Reclamation, Environment, and Safety Act of 2009 (H.R. 493), proposed by House Natural Resources Committee Chairman Nick Rahall (D-WV), would require mandatory design and performance standards on coal ash impoundments to make them consistent with similar enclosures used for slurry waste in the coal mining industry. New requirements proposed in the bill include a geotechnical analysis of an embankment's foundation area, an assessment of past surface mining activity at the proposed location of a structure, and mandatory inspection by a certified engineer during and after construction.

"We need to learn a lesson from what happened at Kingston. This issue cannot be ignored," stated Rahall at a February 12, 2009 subcommittee hearing. The bill was challenged by Congressman Doug Lamborn (R-CO) for not including a funding mechanism for enforcement of the new standards. The bill currently calls for a six-month time frame for implementation, although John Craynon of the Department of Interior's Office of Surface Mining said it was unlikely the new standards could be in place in that short of a time-frame. Despite the potential delay, Rahall stated he was flexible with the time-frame and plans to bring the

Government Update *continued on page*

Government Update continued from page 53

bill to full committee for mark-up as soon as possible.

The full text of H.R. 493 is available at:
http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.00493:

EPA Reconsiders California Waiver

During his first week in office, President Obama issued an executive order asking the Environmental Protection Agency (EPA) to review its decision to deny California's request for a greenhouse gas (GHG) emissions waiver. As of February 6, 2009 the EPA has opened the waiver for review and is accepting public comments on possible changes. It was also to hold a public hearing in March.

California first requested permission to set a stricter standard for GHG emissions within the state in 2005, citing its battles with air pollution as the primary reason for deviating from federal standards. The previous EPA Administrator Stephen Jackson denied the request in March 2008, saying that adhering to President Bush's national approach to GHG emissions standards would be more effective. If the EPA grants California the waiver, 17 other states are set to adopt the same stringent standards. The vehicles in these 18 states make up 50 percent of the auto market, so the waiver would markedly impact the auto industry's emissions standards.

EPA Close To GHG Emission Ruling

The new EPA Administrator Lisa Jackson announced that the agency is close to deciding whether or not GHGs are dangerous to human health and welfare. If the EPA rules that GHGs are indeed a danger to humans, it will be required to regulate gases such as carbon dioxide under the Clean Air Act. A decision is expected by April 2, 2009, the second anniversary of the Supreme Court ruling that spurred this investigation. The previous administrator remained quiet on the subject, deciding only to pass the decision off to the next administration. If added to the list, GHGs would join other pollutants already federally regulated by the act, challenging the EPA to decide how to best monitor GHG emissions.

Yucca Mountain Regulations Move Ahead Slowly As Alternatives Explored

On February 16, 2009, the Nuclear Regulatory Commission (NRC) approved the EPA's one-million-year allowable radiation

levels of 15 millirems for the first 10,000 years and 100 millirems thereafter. This is just one step, though, in getting the NRC to approve the application requesting Yucca Mountain as the long-term geologic repository for U.S. civilian nuclear waste. The application was finally submitted in June 2008 after numerous delays, and at this point the earliest Yucca Mountain could be operable is 2020. After two decades of planning, the nuclear industry is understandably worried about the fate of the program.

Alongside this small victory came the call from the Nuclear Energy Institute (NEI) for a back-up plan. The NEI asked President Obama to create a commission to explore alternatives to long-term storage, like recycling or reprocessing spent nuclear fuel. The administration plans to look into alternatives while continuing to cut funding for the project. The House succeeded in cutting another $100 million from the project in the 2009 spending omnibus passed on February 25, 2009 and the President's request for 2010 allows only for a review of the project. Despite continued problems and calls from opponents to withdraw the site, Energy Secretary Chu supports following through with the licensing process as a learning experience. So the project struggles on, despite repeated efforts to terminate the whole process.

Legislatures in Two States Look to Implement Carbon Sequestration Bills

Republicans in the Montana state legislature drafted a bill at the end of February that would set the table for carbon sequestration in that state, a necessary step for future development of coal-fired power plants and other coal-related technologies, according to Governor Brian Schweitzer (D). The bill would set up a program under the Montana Board of Oil and Gas Conservation to manage carbon capture and subsurface storage operations. Although encouraged by their colleagues to recognize problems associated with global warming in the state, Montana Democrats still indicated more issues need to be resolved, especially with ownership legalities and specific methodologies of subsurface storage before any bill passes the legislature.

Wyoming, the nation's largest producer of coal, is even further along with developing regulations for a carbon sequestration program with the passage of several bills in the state that continue to outline carbon storage rights. In 2008, Wyoming became the first state to address carbon storage by passing legislation that stated surface owners also own underground storage rights. The carbon sequestration legislation of the two states' marks a continuing trend of state initiatives to combat carbon emissions and other global warming issues as cohesive federal legislation fails to pass.

Key Reports and Publications - February 2009

Congressional Research Service (CRS): Wind Energy: Offshore Permitting (http://opencrs.com/document/R40175) A report released in February 2009 discusses the current legalities of permitting offshore wind turbines in waterways under federal and state jurisdiction.

U.S. Energy: Overview and Selected Facts and Numbers: (http://opencrs.com/document/R40187) A report released in February 2009 provides an overview of the nation's aggregate energy consumption, along with detailed analysis of trends/statistics regarding specific sources of oil, electricity, natural gas, coal, and renewables. A special section on energy efficiency is also presented

Alternative Fuels and Advanced Technology Vehicles: Issues in Congress: (http://opencrs.cdt.org/document/R40168) A report released in January 2009 provides an overview of current issues and obstacles surrounding alternative fuels and advanced technology vehicles.

Key Federal Registry Notices - DOE

The Department of Energy (DOE) is providing a Notice of Opportunity for Technical Assistance (NOTA). The purpose of the NOTA is to support the goal of the DOE's Solar America Initiative (SAI) to reduce the cost of solar photovoltaic technologies so that they become cost-competitive with grid electricity by 2015. For more information on this program, visit http://www1.eere.energy.gov/solar/solar_america/index.html.

Department of the Interior

The U.S. Geological Survey announces a price increase for primary series quadrangles, thematic maps, national earthquake information center maps, and large format and poster maps. The increases in prices are as follows: (1) 7.5 minute 1:20,000 through 1:63,360-scale, and 7.5 minute x 15 minute 1:25,000 through 1:250,000-scale primary series quadrangles from $6.00 to $8.00 per quadrangle. (2) Thematic maps and small-scale National Park maps from $7 to $9 per sheet. (3) National Earthquake Information Center maps bearing private sector copyright from $10 to $12 per sheet. (4) Large format and poster maps from $7 to $10 per sheet. Prices for these products were last revised seven years ago and are adjusted to accurately reflect and ensure recovery of the costs associated with their reproduction and distribution. ■

HGS Welcomes New Members

Effective March 2009

ACTIVE MEMBERS

Alfred Baker Jr.
Howard Barousse
Seth Betterly
Karen Blake
Bruce Cain
Elizabeth Geiger
George Gunn
James Hnat
Heidi Howe
Yousuf Jamal
Alicia Kahn
Peter Kahn
Byrd Larberg
Joshua Long
Charles Lundberg
Bryce McKee
Tom Mize
John Morony
James Murphy
Gary Oliver
Christopher Olson
Donald Orr
Neil Shannon
Pamela Taneza
William Tate
Ching Tu
Christopher Varga
Katerina Yared
Karen Yip

ASSOCIATE MEMBERS

George Baker
Jody Ehler
Fernando Gutierrez
Leslie Haines
Bob Harvey
Brandy Obvintsev
Amalia Villarreal

STUDENT MEMBERS

Chris Botsford
Fernando Gutierrez
Valerie Hawkins
Lynn Richards

Welcome New Members

Be sure to cast your vote in the HGS election by May 10, 2009.

Remembrances

Fred Balay

Fred Balay passed away February 18, 2009 at his home in Houston, Texas after a long illness. Born in 1951 in Pampa, Texas, as a young man he worked in the oil fields around Pampa before enlisting in the Marine Corp during the Vietnam War. He returned to Texas to study geology at West Texas State University and following graduation, he worked as an offshore openhole wireline field engineer in Houma, Louisiana. He ran conventional openhole logs and provided basic log interpretation for Dresser Atlas from 1977-1980.

By 1980, Mr. Balay was working as a geologist in the Arco's Houston office. Aside from a very brief move to Plano in the mid 1980s, he worked Gulf Coast geology from Houston for the next 28 years where he made discoveries in the Yegua, Wilcox, and Frio/Vicksburg. His grasp of regional Gulf Coast geology and the vast quantities of detailed log correlations he created earned him the name around Arco "the geologist of Texas." He enjoyed drilling wells and had a long string of successes while at Arco /Vastar /BP. Mr. Balay was also a good friend to Mexico, helping develop an understanding of the Burgos Basin as part of his continued support of endeavors in that area. He was at his best deep in amongst the many wells and fields, trying to unravel the stratigraphy and its petroleum potential.

His gruff exterior and cutting humor hid a kind and patient man with an unrelenting work ethic. Mr. Balay was a member of the American Association of Petroleum Geologists and Houston Geological Society. He will be missed by the many geoscientists and engineers he worked with over the years as well as his wife Tina and son Sean. Memorial services were held on February 20, 2009 at the Veterans Memorial Cemetery in Houston. Donations in honor of Fred Balay can be given to Arthritis Foundation Inc at 2011 Pennsylvania Avenue, NW 6th Floor, Washington, DC 20006. ■

Raymond Eugene Fairchild

Raymond Eugene Fairchild, a former member of HGS, passed away on March 11, 2009 in Mineola, Texas at the age of 86. Mr. Fairchild was from Bowling Green, Ohio and served in the Army in Europe during WWII. He moved to Houston and worked for Panhandle Eastern, Trunkline Gas Company, Anadarko Oil Company, Maersk Company in Denmark, and retired from Hunt Oil Company of Dallas, Texas in 1986. He enjoyed retirement with his wife Eleanor on their farm in Winnsboro, Texas. ■

William Bradford Hill, Sr.

William Bradford Hill, Sr. (Bill), 76, passed away on March 12, 2009 after a courageous battle with Lou Gehrig's disease (ALS). Born in Houston, Texas on March 8, 1933, the family moved to Georgia, where he graduated from Decatur Boys High School in 1951. He received his B.A. in geology from Emory University in 1955. He continued graduate studies at Emory and Tulsa University. Following college, Mr. Hill served for eight years in the United States Naval Reserves. He loved working in the "oil patch" and was blessed to have found a profession that was challenging and fun every day. He valued education and continued to study geology, politics, and history throughout his life.

Mr. Hill was a member of the Houston Geological Society, American Institute of Professional Geologists, Society of Independent Professional Earth Scientists, American Petroleum Geological Society, and the American Association of Petroleum Geologists and was a Certified Petroleum Geologist and a Certified Petroleum Geological Scientist. In lieu of flowers, the family requests that those wishing to do so make a donation to the Muscular Dystrophy Association, 3300 East Sunrise Dr., Tucson, AZ 85718, with the designation "for use in the fight against ALS." ■

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 diskette 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 .eps (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 .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 zip disk.

Advertising

The *Bulletin* is printed digitally using QuarkXPress. We no longer use negatives or camera-ready advertising material. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email to ads@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

Random Inside (Black & White)					Page 2 (B&W)	Inside Front Cover (Full Color)	Inside Back Cover (Full Color)	Outside Back Cover (Full Color)	Calendar Back (Full Color)	Calendar Page (Full Color)
No. of Issues	Random* Eighth	Random* Quarter	Random* Half	Random* Full	Full	Full	Full	Half	Full	Quarter
10	$823	$1,387	$2,488	$4,734	$5,680	$7,830	$7,560	$6,858	$6,750	$2,700
9	$823	$1,387	$2,488	$4,734	$5,680					
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		
4	$405	$683	$1,223	$2,326	$2,792					
3	$327	$550	$990	$1,886	$2,262					$1,080
2	$232	$392	$704	$1,339	$1,607					
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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; full-time students and emeritus members pay $12.00.

Mail this application and payment to:
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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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Endorsement by HGS member (not required if active AAPG member)

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rev.08/11/2008

Houston Petroleum Auxiliary Council News

Norma Jean Jones, HGS Liaison

Mark Twain said, "It's spring fever ……..you don't quite know what it is you do want, but it just fairly makes your heart ache, you want it so." Spring 2009 finds many Americans experiencing that kind of wanting; wanting a strong economy again, wanting everyone to have a job, not a handout, and wanting peace around the world so our young men and women can come home. Don't you just want to do something about all this so badly sometimes that it fairly makes your heart ache? I do.

On Friday, May 15, HPAC will hold their Annual Business Meeting and Luncheon Style Show at the Houston Racquet Club on Memorial Drive, 10:30a.m. to 2:00 p.m. This will be our final event of the year and officers for the year 2009-2010 will be installed. The theme for the style show, presented by Coldwater Creek, is "Posies and Polka Dots." Doesn't that sound inviting? Hope to see you there. Please bring guests and encourage potential members to join us.

On Tuesday, April 21, the Geowives held their Annual Luncheon and Installation of Officers at Bistro Calais, which is the Michael Dechaumes Cottage (1880) at 2811 Bammel Lane. Names of the 2009-2010 officers for HPAC and Geowives will be reported in the June issue of the HGS *Bulletin*.

Geologists, please take the *Bulletin* home to your spouses and introduce them to HPAC. Membership in HPAC is a very economical way to have some fun and meet other spouses of petroleum geologists, engineers, geophysicists, and landmen. There are four events each year that offer interesting entertainment, socializing, and good food at great locations such as Houston Racquet Club, the Houston Junior League, and Lakeside Country Club. In addition, there are opportunities, if one is so inclined, to help out at the office of the Houston Geological Society, volunteer to help with conventions held in Houston, etc. The membership form is printed in each *Bulletin*. It's a good thing!

Worth Quoting: "Before you criticize someone, you should walk a mile in their shoes. That way, when you criticize them, you are a mile away and you have their shoes." Author Unknown ■

See you at something geological!
Norma Jean

You are invited to become a member of

HPAC

2008–2009 dues are $20.00

Mail dues payment along with the completed yearbook information to Carol Gafford, 13323 Misty Hills Drive, Cypress, TX 77429

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Please choose a committee assignment if you are interested.

☐ Fall Event	☐ Yearbook	☐ SOS	☐ Membership
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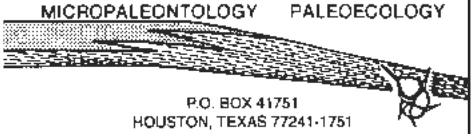

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WEEK 1	Structural Styles in Petroleum Exploration and Production	August 24 - 28
WEEK 2	Sequence Stratigraphy of Clastic Rock / Reservoirs: Well Logs / Core / Outcrop & Seismic	August 31 - September 4
WEEK 3	Open Hole Log Analysis (Practical Interpretation of Open Hole Logs)	September 5 - 11
WEEK 4	Overview of Seismic Exploration: Seismic Acquisition and Processing, AVO and Attributes and 2-D / 3-D Interpretation	September 14 - 18
WEEK 5	Applied Subsurface Geological Mapping	September 21 - 25
WEEK 6	Seismic Interpretation Workshop	September 28 - 30
	Basic Reservoir Engineering for Non-Engineers	October 1 - 2

	PROJECT	FALL
WEEK 7	**Phase I** Initial Exploration - Delineate Prospects - Drill Exploration Wells	October 5 - 9
WEEK 8	**Phase II** Assess Discovery - Refine Interpretation	October 12 - 16
WEEK 9	**Phase III-A** Field Development - Drill Development Wells	October 19 - 23
WEEK 10	**Phase III-A** Field Development Continued	October 26 - 30
WEEK 11	**Phase III-B** Explore for Additional Prospects	November 2 - 6
WEEK 12	**Phase IV** Field Performance Analysis - Results of Other Exploration Prospects	November 9 - 11
	Phase V Present Report and Project Results	November 12 - 13
	Graduation Celebration	November 13

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