HGS Bulletin
Houston Geological Society
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The Trident Discovery: Play Opener of the Perdido Foldbelt, Deepwater Northwestern Gulf of Mexico

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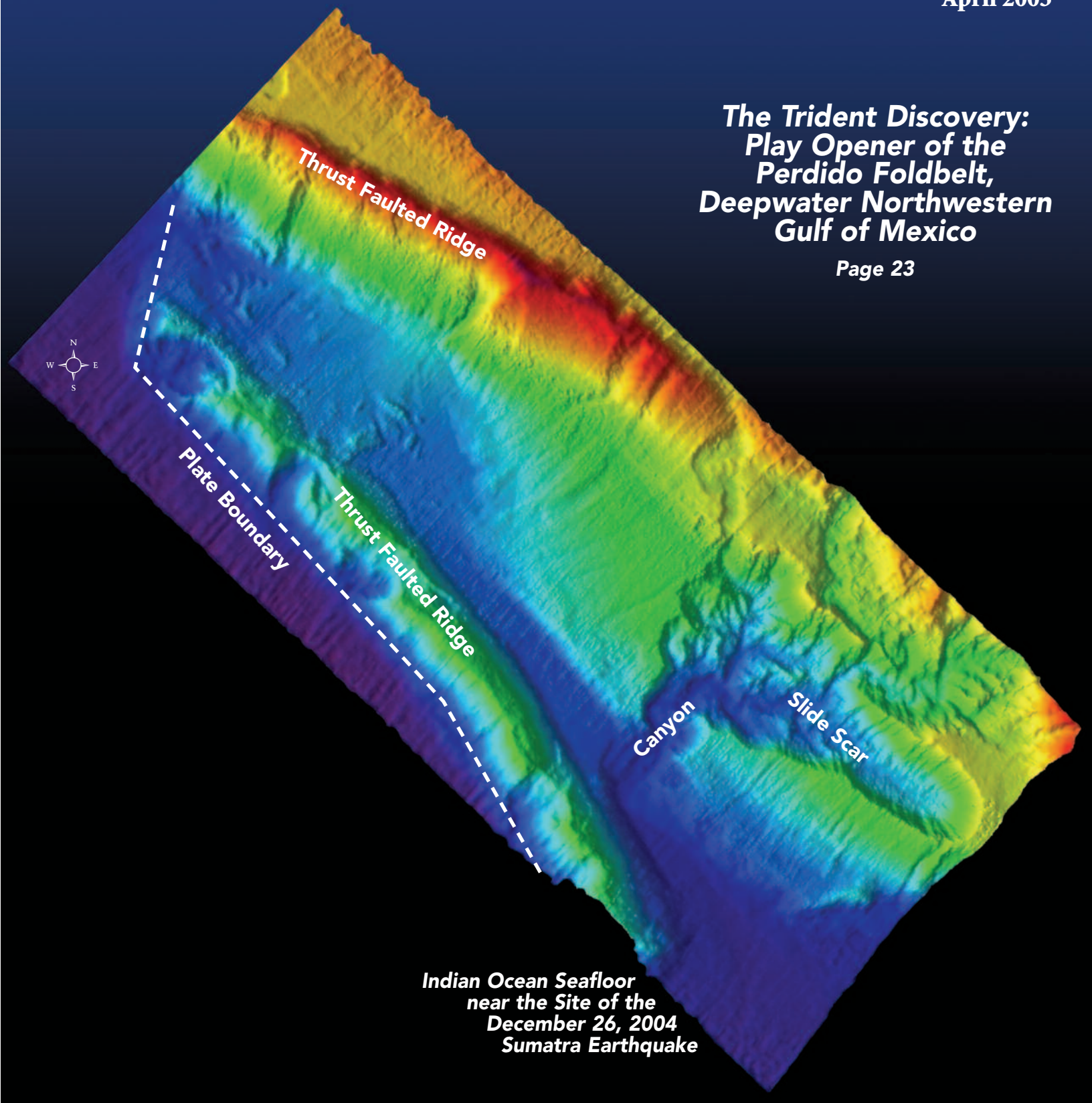

Indian Ocean Seafloor near the Site of the December 26, 2004 Sumatra Earthquake

The Bulletin
Houston Geological Society

Volume 47, Number 8 April 2005

In Every Issue

about the cover: Indian Ocean sea floor near the site of the December 26 2004 Sumatra earthquake along India-Australia/Eurasian plate boundary.
Cover image supplied courtesy of the Royal Navy, UK Hydrographic Office and CARIS®.

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President's Letter

by Steve Levine

Our Society Is Like a Courtbouillon

Courtbouillon (coo-be-yon) to those unfortunate few uninitiated in Louisiana cuisine, is a spicy soup or stew made with fish fillets (redfish, red snapper, catfish, etc.), tomatoes, onions, and vegetables. The cook must first prepare a fine roux of vegetable oil and flour in a large heavy skillet. Add onions, fresh vegetables, pepper, salt, other spices and keeps stirring. Let it simmer for 1 to 2 hours before adding the fish filets. Continue cooking on low heat until the fish is done. Courtbouillon is served with white rice or mashed potatoes. Great redfish courtbouillon is hard to beat. Two things are for certain—it is essential that someone keeps a close eye on that skillet at all times, and that the ingredients are fresh.

The Houston Geological Society works with a variety of ingredients as well. The HGS Board is busy in the kitchen overseeing the skillet of 42 committees trying not to burn the roux or let it simmer too long. We mull issues such as the budget, website advancements, populating the calendar, awards, Bulletin updates, office needs, etc. Occasionally we have brief moments to look away from the skillet to modify the recipe (brainstorm), but generally the best ideas come from the members at large and from the committees themselves.

We are privileged that our skillet contains so many committees that provide quality ingredients for our members.

We are privileged that our skillet contains so many committees that provide quality ingredients for our members. Please take a few minutes to read about a few of these achievements and how they have spiced up the HGS.

Continuing Education Committee

The Continuing Education Committee has transformed itself in a short time span from being "barely there" to an incredibly vibrant group. Led early in the year by **Jonathan Jee** (prior to his transfer to Malaysia) and currently by **Cheryl Desforges**, this team that has organized 3 terrific short courses and has 2 more scheduled. These include:

1. "The Petroleum Reserves-Avoiding Write-downs" Mini-series: Part 1- "An Overview of Definitions and Reporting Requirements" by John Hodgin and Thomas Wagenhofer
2. "The Petroleum Reserves-Avoiding Write-downs" Mini-series: Part 2 - "An Overview of Recommended Geologic Practices" by Dan Tearpock
3. "Rock-Based Integration: Geologic Interpretation of the Integration of Seismic and Petrophysical Data" by Roger Young and Gordon Van Swearingen
4. "An Overview of Recommended Engineering Practices" by Bill Kazmann and Ed Travis (May 20)
5. "An Overview of Recommended Petrophysical Practices" by Bill Price (Sept./Oct.)

Dick Easterwood of Dominion Exploration and Production stepped forward to contribute funds for the purchase of equipment for the HGS to tape these and future continuing education courses. **Thomas Smith of Seismic Micro-Technology**, offered to sponsor the reproduction of the DVDs, as well as to provide expertise of the process. **Fugro Jason** also offered financial backing, which we hope to utilize for the purchase of additional equipment. HGS member **Mike Allison** graciously volunteered to provide the labor and technical expertise to produce the DVD. Mike has done a remarkable job after many hours of toil to make the first of the series of DVD's. With these two financial offers, the DVD preparation should produced at no cost to the HGS, so revenue from the sale of the DVDs can be used for other HGS programs. So if you missed these great short courses, the first of several DVDs should be available for purchase at a bargain price by the AAPG Convention in June.

Ad Hoc "Community Involvement" Committee

An ad hoc "Community Involvement" committee led by Cathy Ferris was formed to generate ideas to expand our presence in the community through service projects, further our interaction with local K-12 students (in coordination with the Academic Liaison Committee), and to identify social events that could cast a larger net across our membership and to bring new members into the fold.

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President's Letter continued from page 5

1. **Home repair projects** to provide community service and to make the HGS more visible in the community. The HGS will assist in a **"Keep 5 Alive" service project on Saturday, April 2** at the 177 year-old Evergreen Negro Cemetery with partners ConocoPhillips and Wheatley High School senior students.
2. **Social events** such as sports or entertainments events such as the **"Rockets Night Out"** held in March and the **"HGS Astros Night"** scheduled for Thursday, April 21, are direct responses to these recommendations.
3. Adding **"K-12 Teacher Resources"** to the HGS website to assist in our partnership with local schools. **Bill Osten** is working with our Webmaster **Dave Crane** to add this component.
4. Other ideas included **sponsoring and running a field trip for some Houston Area high school students** and the **HGS manning a water stop** for a selected Houston Area race such as the Houston Marathon in January, 2006.

First Annual Scholarship Benefit

The scholarship benefit committee worked very hard to make the first Scholarship Benefit Party "Scholarship Rock Dance" held at the Petroleum Club on February 5, 2005 a success. Preparations required acquiring silent auction items, decorating, and selling tickets. A total of $3500 was raised which will be matched by the AAPG-GCAGS to bring our total to $7000 for the HGS Foundation and W.L. Calvert Memorial scholarship funds. More details of this event will be in the May *Bulletin.*

Below are just a few of the terrific volunteers from the above-mentioned committees. Space does not allow me to mention the many other worthwhile projects and committees that make our spicy recipe one of best.

Continuing Education Committee: Cheryl Desforges, Mike Allison, Jonathan Jee, Donna Davis, Henry Wise, George Klein, Selim Shaker, Huw James, Edgar Guevara, Thomas Tucker, Dave Hixon, Henry Wise, and Matthew Cowan

Ad Hoc Community Involvement Committee: Cathy Ferris, Jennifer Burton, Sherrie Cronin, Tom Miskelly, and Bill Osten.

Scholarship Benefit Committee: Deborah Sacrey, Marsha Bourque, Andrea Reynolds, Mary Kae Dingler, Carl Norman, Natalie Ushner, and Steve Levine

Now I had better hurry back to that skillet before my courtbouillon overcooks. ■

Editor's Letter

Article and Photos
by ***Arthur E. Berman,***
editor@hgs.org

HGS Guest Night will be June 11, 2005 at the Museum of Natural Science.
The topic will be tsunamis and earthquakes, explained by Dr. David Applegate of the USGS.

Letters From Jakarta: Indian Ocean Nations Select a Tsunami Warning System

After 12 years of siege, the armies of King Priam awoke one morning to find their Greek opponents gone from the Plain of Troy. A giant wooden horse stood alone outside the city. Priam and his men decided to bring the horse inside the walls of Troy to celebrate their victory over the Greeks. Not all of Priam's men, however, agreed with the decision.

Chief among the king's counselors was an elder named Laöcoon*. Laöcoon and his sons urged Priam to reconsider the decision and to investigate the situation more fully before bringing the horse into the city. It seemed peculiar, Laöcoon argued, and out of character that the Greeks had departed for no apparent military reason and had left behind a gift. In addition, he thought he heard sounds coming from inside the horse. Laöcoon and his sons were killed by the Trojans. The horse was brought into the city and the Greek soldiers concealed within the horse emerged, sacked Troy, and won the Trojan War.

If there ever were a situation and opportunity to demonstrate the value and relevance of geology in a practical, meaningful way, this is it!

It is not too late to modify the decision made in late January 2005 by the Association of Southeast Asian Nations. The Houston Geological Society should take the lead in calling for a meeting of world experts on earthquakes, tsunamis and disaster planning. The goal of this meeting would be to help the nations of the Indian Ocean in their difficult and complex task of planning for the inevitability of future earthquake and tsunami threats.

In my February "From the Editor" (Berman, 2005), I was critical of the leaders of the Indian Ocean nations for doing nothing to prepare their people for the possibility of a tsunami. The Malay Archipelago, on the eastern margin of the Indian Ocean, is the most active earthquake region in the world and undersea earthquakes are the principal cause of tsunamis. While no one could predict when or where an earthquake might occur large enough to produce a deadly tsunami, the plate tectonic model clearly underscored the probability of such an event around the Archipelago.

As a result of that article, I received many letters from people around the world including the Hungarian Ambassador to Indonesia, Dr. György Busztin. I published Dr. Busztin's first letter in the March 2005 *Bulletin*. In it he asked me to help him communicate to Indonesian leaders what the earth science community knew about earthquakes and tsunamis so he might influence creation of greater awareness in that devastated country.

In a subsequent letter, Dr. Busztin described what he had seen in Banda Aceh, the capitol of the most heavily damaged part of Indonesia, following the tsunami. He wrote:

"Banda Aceh itself, the provincial capital, is like a cake cut in half. The part of the city exposed to the sea literally disappeared, with nothing remaining but the debris of buildings covered by mud, or not even that. Houses reduced to their foundations. Cars look like a giant has stepped upon them, even huge lorries squeezed into grotesque forms. A mid-size drilling tower sits in the middle of one destroyed suburb, planted there **Editor's Letter** *continued on page 10*

** Laöcoon is the root for the English word laconic, meaning terse or concise, often used to refer to someone who says little but, when he speaks, is worth listening to. He is known for the famous quote, "When Greeks bring gifts, I fear them, gifts and all."(Virgil,* The Aeneid, Book II, *59-70) Myth accounts for his death by snakes sent by Poseidon or Athena. My interpretation is that he was killed by his fellow Trojans.*

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by the tsunami. Large boats were taken inland to the distance of a kilometer.

"Your article has reached top destinations. The beneficiaries requested not to be named, for obvious reasons. The reactions I had were—obviously—muted. One decision maker was slightly irritated by your comments. He argued no contingency plan can deal with a situation where you can only guess when the calamity will take place, give or take a few decades.

"As I see it, your article is a great eye-opener and should be treated with due respect. The problem of prevention and contingency planning is essentially money. You cannot relocate people to a safe distance from the sea, nor build tsunami-proof structures without adequate funding. The reconstruction effort now under way will certainly take into consideration the looming danger of a new tidal wave, but how will you prevent people from slowly moving back to the seaside, with the sense of imminent danger fading away? For those making a living from the sea—fishermen, prawn and seaweed cultivators, etc.—there is not much alternative to living on the shore. Unless they are settled in places made disaster proof, but that needs more resources than are possibly available.

"Someone I can't remember, a scientist of renown, once said: humanity can always foresee the impending catastrophe, can never avert it, but always survives it. A great truth. But no consolation for those who didn't make it this time."

Later, he sent me a letter reporting on an important meeting of the Association of Southeast Asian Nations (ASEAN) in Phuket, Thailand January 28-29, 2005. Approximately 50 nations, including those most affected by the December 2004 tsunami, decided to accept a UNESCO (United Nations Educational, Scientific and Cultural Organization) plan for a tsunami early warning center for the Indian Ocean region. The plan entails implementing a detection system of deep ocean buoys and tethered bottom-moored pressure recorders (BPR) similar to the U.S.'s Deep Ocean Assessment and Reporting of Tsunamis (DART) network in the northeastern Pacific Ocean.

The Indian Ocean tsunami alert system would include shared use of satellite-based weather forecasting data, hazard maps and disaster-response strategies at a community level. The estimated cost for the plan is about $30 million but only $8 million has been pledged to-date by UNESCO nations. In the best case scenario, the alert system would be operational in 18 months, but structural and political barriers, commercial and national rivalries, as well as financial pressures resulting from the 2004 tsunami, are likely to delay implementation considerably.

Probably the plan's greatest obstacle is complacency among the Indian Ocean nations. These countries resisted pressure to join the existing tsunami alert network in the Pacific because of self-interest, financial constraints and no sense of urgency. When the December 2004 tsunami struck the region, basic communication protocols with the World Meteorological Organization's Global Telecommunication System were not in place. These protocols could have warned affected areas within 30 minutes of the Sumatra earthquake using existing seismological technology and not requiring specific Southeast Asian detection systems. There were several reports of workers in earthquake and tsunami monitoring stations around the world who knew there was tsunami danger to the Indian Ocean region. They did nothing because they did not know whom to call.

Smart People Make Bad Decisions

Two key questions arise from the tsunami that killed more than 250,000 people in the Indian Ocean region in December 2004. First, why did leaders of these nations fail to implement the most basic tsunami alert system, namely a telephone tree linked to the Pacific warning system? In my February "From the Editor" I criticized these leaders for ignoring the well-known history of earthquake and tsunami danger in both the Malay Archipelago and Bay of Bengal (Berman, 2005).

Second, now that the worst-case scenario has occurred, why do these same leaders, who chose to do nothing and spend no money beforehand, elect to rush headlong into the most expensive and technologically risky plan available, namely, duplicating the U.S. DART system?

The answer to both questions lies, I believe, in the psychology of group behavior. The people of Troy awoke one morning after 11 years of siege to the sudden departure of their Greek oppressors. On the plain beyond the city walls they saw something both beautiful and tantalizing. Southeast Asia awoke on the morning of December 26, 2004 to the aftermath of the deadliest tsunami in human history. Instead of a wooden horse, they saw a sophisticated and expensive ocean alert system on the horizon of the Pacific Ocean. With no more investigation than Priam conducted on the horse, the leaders of ASEAN decided to bring the DART system into their city.

The problems with DART include that it is to-date largely unproven, would cost millions of dollars and take many years to implement, may not provide sufficient warning time to protect inhabitants, and ignores the more effective and immediate alternatives of awareness training and implementation of a simple, inexpensive alert mechanism. At present, only half of the DART sensors are functioning in the Pacific due to equipment failure.

History is full of astonishing examples of how great states and institutions often consciously pursued policies and strategies that were not in their best interests, and sometimes led to their downfall. The Trojan horse is the archetypal example of the tendency for smart people to make bad decisions.

In her 1984 book *The March of Folly: From Troy to Vietnam*, popular historian Barbara Tuchman describes several outrageous examples of smart people who made poor or ill-informed decisions (Conway, 1998). The Catholic Church managed to lose half of Christendom in the 16th century because seven Renaissance popes consistently ignored advice to abandon secular endeavors and end corrupt practices within the Church. The British Empire lost America in a war of independence that no one in the North American colony initially wanted or supported, due to failure to adopt minimal measures to satisfy the clear and simple requests from the colonists. During the decade leading up to World War II, the Japanese Empire convinced itself to attack Pearl Harbor as the best way to avoid violating its cardinal strategy of not becoming involved in a war with the United States!

During the 20 years that I spent in the corporate oil business, I saw equally impressive examples of smart people pursuing strategies and making decisions that made no sense for their companies. During the 1970s, for example, Amoco was among the most successful major oil companies in the United States. Amoco lead the domestic industry with major play discoveries in the Wyoming-Utah Thrust Belt and the Louisiana Tuscaloosa Trend. The company found new production in under-explored basins all along the Union Pacific land grant in the Rocky Mountains.

In the mid-1980s, Amoco decided to forsake domestic exploration and to become a global E&P company. No one in management seriously investigated if this was a good idea, if the shift from domestic to global activity made sense for the company, or if Amoco had the right capabilities or experience to compete in the international arena. The company subsequently destroyed billions of dollars of value by entering into long-term exploration commitments in areas that were quickly found not to have functioning petroleum systems. When the company was bought by BP in 1999, many observers were stunned, though I cannot imagine why.

The Dynamics of Consensus

Jerry Harvey of George Washington University described the dynamics of consensus in his famous story "The Trip to Abilene." In the parable, a family decided to drive 50 miles to Abilene for lunch even though no one really wanted to go. After a long, uncomfortable round trip and a mediocre lunch, everyone was unhappy with the decision and blamed someone else in the group for the idea to go to Abilene in the first place.

Harvey and a generation of organizational development experts have used the Abilene Paradox as an example of how the consensus process often produces poor decisions. Harvey's hypothesis is that people often agree to do something contrary to their best interests out of desire to fit in, and avoid being left out or alone. He further suggests that most people believe that any decision or action is better than no action at all. The obvious problem here is that incomplete information can lead to poorly informed decisions.

"The need to act together, to be seen as cohesive, overrides the need to be explicit about group assumptions, desires, opinions, and even facts," comments Kathryn Deiss (1999). "Harvey calls this 'action anxiety' and he believes it works in close conjunction with another piece of the paradox puzzle: negative fantasies. These are fantasies each individual harbors of what they think would happen if they actually spoke their minds and offered their desires or opinions to the group."

In 1961, James Stoner conducted a series of experiments to test the assumption that group decisions result in diminished risk. Stoner presented a series of situations to individuals and asked them to make decisions based on the risk they perceived in each. He then repeated the process using the same scenarios and the same subjects, but this time in groups of test subjects instead of individuals. In his experiments, people were willing to accept higher risk levels when making a decision as members of a group, and they were less willing to take risk when making a decision on their own. His experiments found that group decisions are significantly more risky than the mean of the individual group members' prior decisions (Martirossian, 2001).

Subsequent research generally supported Stoner's work but noted important excursions in which some group decisions were more cautious than that of the individuals. The explanation is found in two concepts: group polarization and group investment.

Group polarization means that when an individual goes into a group discussion with a clear and strong position, that opinion tends to be enhanced during the dialogue process and may be adopted as the group decision. An individual with preexisting strong views is often capable of producing a group decision either riskier or more cautious than the average of individual decisions.

Group investment becomes a factor in decision making when the group feels that too much has already been invested to quit. This is the well-known notion of "throwing good money after bad." Once the group has begun the process of bad decision making, further bad decisions are easily justified. Group investment can also become a factor if a particular situation is already so advanced prior to the group meeting that any decision is probably too little or too late. **Editor's Letter** *continued on page 12*

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I will add another factor based on my personal experience with decision making in oil companies. I believe that, in a group, personal motivation can be masked by company slogans and mission-vision-value statements such that pursuit of selfish gains may be disguised to seem to be in the best interest of the company. This is, of course, partly the fault of the company for allowing individual gain to be different than general company benefit.

There is, of course, a broader message in an exploration and production environment in which exploration risk is evaluated by groups of risk experts. It is probable that decisions that emerge from a group like this reduce the risk of a particular prospect or play. Whether they are good decisions is another matter. The appearance of risk committees in major oil companies seems to coincide with the failure to replace reserves by exploration. I cannot say that the two are causally related, but 50 years of studies in the psychology of group decisions suggests that this possibility be considered.

Deep Ocean Assessment and Reporting of Tsunamis (DART)

The technology for tsunami detection and warning that is favored for the Indian Ocean region is modeled after the U.S. DART array of tethered buoys and bottom pressure recorders (BPR) in the Pacific Ocean (Figure 1). BPR's detect pressure variation in water depths as great as 6,000 meters (Figure 2). Information is sent every hour to a geostationary satellite. The key technology lies in the ocean bottom apparatus that includes a quartz-strain water pressure sensor.

The DART system uses a Digiquartz® Broadband Depth Sensor—a quartz force transducer—to detect minute pressure changes related to ocean waves and currents. The technology is identical to the quartz strain gauges used in oil and gas well MDT (Modular Formation Dynamics Tester) pressure measurements. When force is exerted on the crystal, electric charges are formed on the crystal surface in proportion to the rate of change of that force (Figure 3). To make use of the device, a charge amplifier is required to integrate the electric charges to give a signal that is proportional to the applied force and big enough to measure. The first transducers to apply the piezoelectric effect for measurement used naturally grown quartz but today mostly artificial quartz is used.

DART bottom-moored pressure recorders are capable of detecting deep ocean tsunamis with amplitudes as small as 0.5 cm in water depth up to 6 km (Milburn et al., 1996). Buoys transmit wave pressure information every hour. A tsunami automatically triggers them to transmit at least once per minute for four hours. Each buoy costs about $260,000 to buy and deploy and about $200,000 a year to maintain.

Data is then relayed via a NOAA-GOES (National Oceanographic and Atmospheric Administration Global Earth Observation System) link to ground stations in Hawaii and Alaska that process and prepare the signals for dissemination to the NOAA Tsunami Warning Centers, the National Data Buoy Center and Pacific Marine Environmental Lab. NOAA geophysicists use the data to determine the size of the wave, what areas may be at risk, and if a watch or warning is necessary.

Warning centers also receive seismological data routed through the National Earthquake Information Center in Golden, Colorado, and information from a series of tidal gauges spread along the Pacific Coast. Officials at the Pacific Tsunami Warning Center near Honolulu monitor the Pacific Basin and have agreements with 25 countries to provide warning data. Officials at the West Coast and Alaska Tsunami Warning centers issue alerts to Pacific Coast states and Canada.

Moment Magnitude Scale (M_W)

Most press reports on earthquakes incorrectly refer to earthquake measurements as Richter scale magnitudes, in the same way that they often refer to tsunamis as tidal waves. Earthquake magnitudes are expressed in terms of the Moment Magnitude Scale or "M_W". The Richter Scale has not been used in earthquake seismology for nearly forty years.

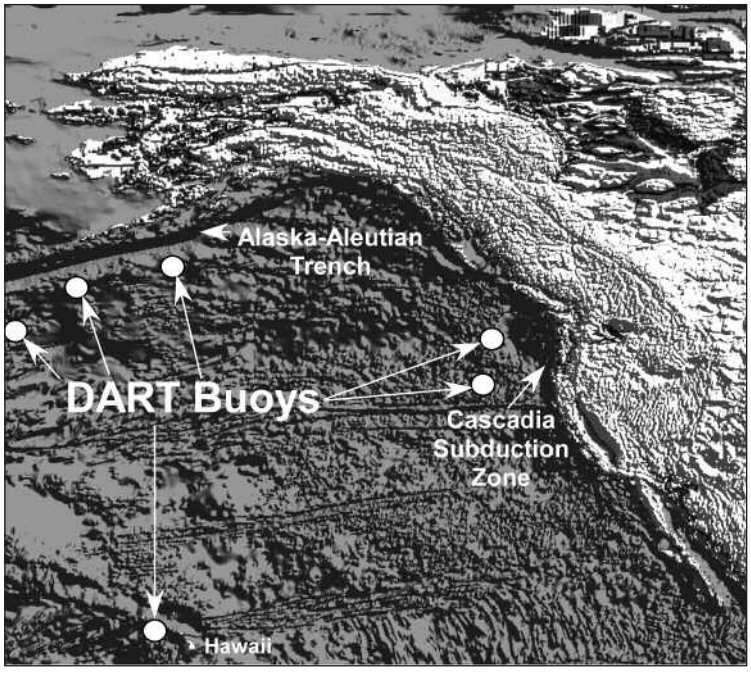

Figure 1. Distribution of DART Buoys (Modified from Deep-ocean Assessment and Reporting of Tsunamis (DART))

During the 1930s, Charles Richter developed the earthquake magnitude scale that bears his name. Like most good geophysicists, he focused on peak seismic amplitude. Richter's scale compared the peak amplitude of an earthquake with a calibration amplitude, plus a distance correction based on the local velocity field (a function of the geology) to derive what he called the local magnitude (M_L):

$$M_L = \log A - \log A_o,$$

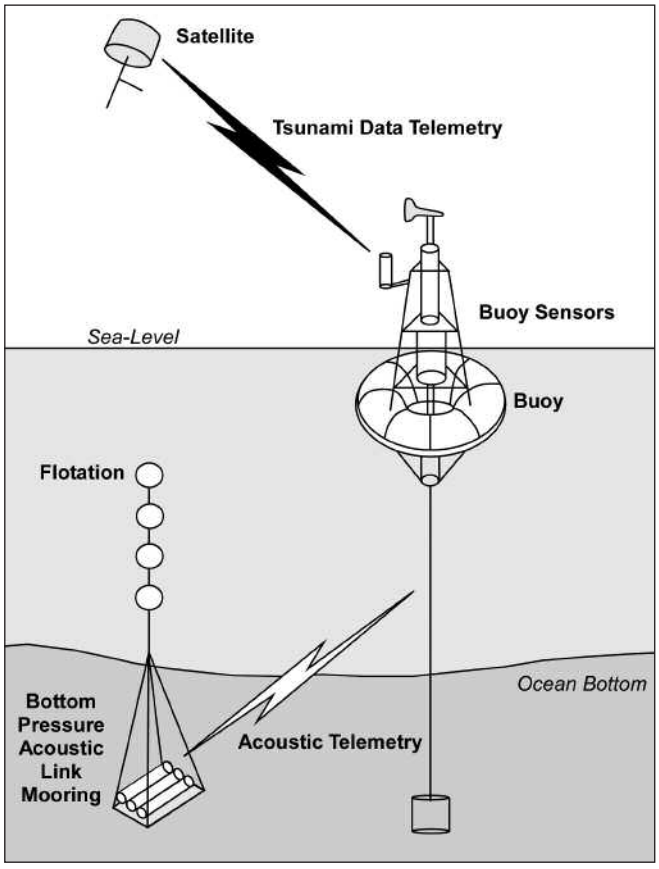

Figure 2. DART Deep Ocean Buoy Configuration (Modified from Deep-ocean Assessment and Reporting of Tsunamis (DART))

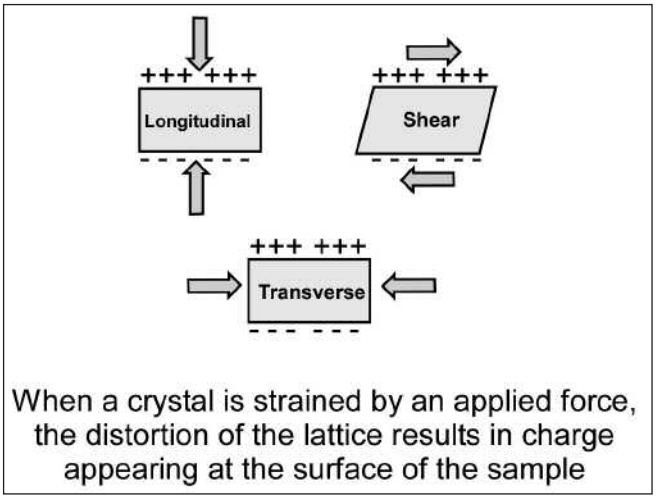

Figure 3. Piezoelectric Effect (Modified from Djurisic, 2005)

where A is the amplitude recorded on the seismogram and A_o is the amplitude observed for a reference event.

Richter's local magnitude scale was developed specifically for calibrating earthquakes in southern California, was valid only for one type of seismometer, and has not been used by professional seismologists for decades (Zhu, 2003).

Earthquakes are complex events and are not well described by a single number or a single attribute, such as amplitude. At the very least, a seismic event is made up of a surface or compressional wave and of a body or Rayleigh wave. Richter's peak seismic amplitude method was biased toward surface waves. This is because small earthquakes have relatively small rupture areas that produce a strong short period (high-frequency) signal. Large earthquakes have large rupture areas that are relatively depleted in high frequency signal. Deeply focused earthquakes do not generate strong surface waves and, while some earthquakes last longer than others, their peak amplitudes may be the same. In addition, surface wave magnitude measurements "saturate"; that is, no matter how large an earthquake may be, there is an upper limit to the magnitude of its surface wave response.**

To address these concerns, the moment magnitude scale was developed in the 1960s. It is related to the total energy released by a fault rupture. M_w is a physical quantity proportional to the slip on the fault times the area of the fault surface that slips. The moment magnitude is a calibrated proportion of the seismic moment quantity M_o, which is the product of fault rupture area, fault slip and shear modulus:

$$M_o = M \text{ (shear modulus)} \times A \text{ (rupture area)} \times D \text{ (slip offset)}$$

The moment magnitude M_w is calculated by applying a calibration moment and a distance correction, in much the same manner that Richter converted peak amplitude to a magnitude value. The advantage of the Richter method is that an earthquake's magnitude can be quickly determined because surface wave maximum amplitude is the only input required. Moment magnitude requires more information about the rupture's properties. Therefore, initial M_w determinations are estimates based on assumptions mostly about rupture area and slip.

On February 6, 2005, a team at Northwestern University announced that the magnitude of the December 2004 Sumatra earthquake was three times greater than initially estimated. The earthquake's magnitude is now determined to have been $M_w = 9.3$, rather than the 9.0 magnitude initially reported.

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***body waves also have an upper saturation limit.*

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"The rupture zone was much larger than previously thought," said Seth Stein and Emile Okal, professors of geological sciences at Northwestern's Weinberg College of Arts and Sciences.

"The initial calculations that it was a 9.0 earthquake did not take into account what we call slow slip, where the fault, delineated by aftershocks, shifted more slowly. The additional energy released by slow slip along the 1,200-kilometer long fault played a key role in generating the devastating tsunami" (Fellman, 2005).

This makes the December 2004 Sumatra Earthquake the second largest earthquake ever recorded, exceeded only by the 9.5 magnitude May 1960 earthquake in Chile.

1960 Chilean Earthquake and Resulting Tsunami

The U.S. DART tsunami detection system grew out of the Pacific Tsunami Warning System established in 1948. Both were designed and implemented largely as a result of tsunamis that affected Hawaii in 1946 and 1960. The 1960 Chilean earthquake, the largest ever measured, occurred along the coast of Chile near the town of Maullín on May 22, 1960. The earthquake and tsunami that followed took more than 2,000 lives in Chile and caused property damage estimated at $550 million (1960 dollars). The only warning of the earthquake were reports of a series of somewhat smaller tremors (M_W = 8.0) the previous day in an area about 150 km to the north of Maullín.

The 1960 Chile earthquake occurred along a 1000-km portion of a subduction zone where the western margin of the South American Plate overrides the Nazca Plate. The effects of the 1960 Chilean earthquake and tsunami were felt all around the Pacific, killing 61 people in Hawaii and 122 in Japan. Tsunami amplitudes of up to 25 m were reported.

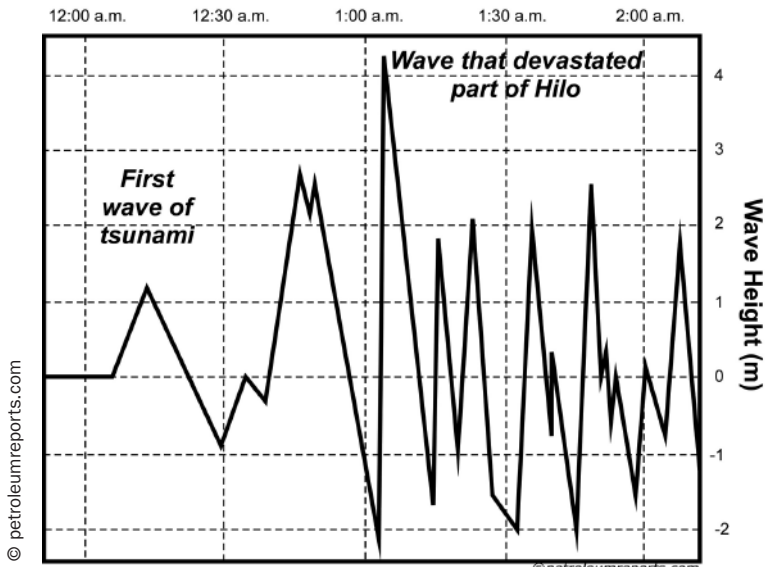

Figure 4. May 23, 1960 Hawaii Tsunami (Modified from Atwater et al, 1999)

The greatest damage in the United States from this tsunami was in the area of Hilo, on the northeastern part of the island of Hawaii. The story of that event is, I believe, instructive in understanding and evaluating the warning and response process for past and future tsunamis, not to mention other large-scale natural disasters.

There was plenty of time for evacuation in Hilo, Hawaii, as the Chilean tsunami moved across the Pacific Ocean on May 22, 1960. At 6:47 p.m. Hawaiian time, the U.S. Coast and Geodetic Survey issued an official warning that waves were expected to reach Hilo at about midnight. Around 8:30 p.m., coastal sirens in Hilo sounded and continued to sound intermittently for 20 minutes. The first wave arrived just after midnight and was about one meter high. A later wave reached a height of over 2 meters. Many people failed to evacuate and others, thinking that the danger had passed after arrival of the second wave, returned to Hilo before the largest wave of the tsunami struck at 1:04 a.m. on May 23 (Figure 4). This wave transformed itself into a bore with a nearly vertical 7 meter front. This last wave caused significant land inundation up to the 6-m contour in Hilo Bay. Sixty-one people were killed and 282 were seriously injured (Atwater et al., 1999).

The warning sirens in Hilo on the evening of May 22, 1960 were interpreted differently by area residents. Although nearly everyone heard the sirens, only about a third of residents thought it was a signal to evacuate without further notice. Most thought it was only a preliminary warning to be followed later by an evacuation signal. Others in Hilo were unsure of how seriously to take the warnings, because several previous alerts had been followed by tsunamis that did little damage.

The warning was based solely on early measurement of the earthquake's apparent magnitude and approximate epicenter using standard seismological methods. In 1960, there was no tsunami warning network. Modeling of wave propagation patterns was not possible because computer technology was not yet sufficiently developed. In other words, sufficient warning was given to residents based solely on seismic information, without a detection network such as DART.

Lives were lost due to insufficient awareness of tsunami behavior by residents and, apparently, experts alike.

Lessons Learned From the 1960 Chile Earthquake and Tsunami

Following the 1960 Chile earthquake and tsunami, the United States Geological Survey interviewed hundreds of people affected in Chile, Hawaii and Japan. Their findings are published in U.S. Geological Survey Circular 1187 (Atwater et al., 1999) and may be summarized as follows:

For areas affected by earthquake:

- Expect earthquakes to lower coastal land: a large earthquake can leave nearby coastal areas lowered, allowing tidal water to flood them.
- Don't count on the roads: when fleeing a tsunami caused by a nearby earthquake, you may find roads broken or blocked.
- Heed natural warnings: an earthquake may serve as a warning that a tsunami is coming, and so may a rapid fall or rise in coastal waters.
- Many will survive the earthquake: in coastal areas, the earthquake may kill fewer people than the tsunami that follows.

For all coastal areas:

- Heed official warnings: play it safe, even if warnings seem ambiguous or you think the danger has passed.
- Abandon belongings: save your life, not your possessions.
- Head for high ground and stay there: move uphill or at least inland, away from the coast.
- Expect many waves: the next wave may be bigger, and the tsunami may last for hours.
- Go to an upper floor or roof of a building: if unable to reach high ground, go to an upper story of a sturdy building or get on its roof.
- Climb a tree: as a last resort, climb up a strong tree if trapped on low ground.
- Something that floats: if swept up by a tsunami, look for something to use as a raft.
- Expect waves to leave debris: a tsunami will leave behind sand, the remains of houses and bodies.

Limitations of DART and Seismological Warning Systems

An average of five tsunamis affects the Pacific Ocean every year. Tsunamis caused about 50,000 deaths over the past 100 years before the December 2004 tsunami. U.S. coastal communities receive shore-based seismic data and information from coastal sea level stations. According to NOAA, these have resulted in a 75% false alarm rate (Milburn et al., 1996). An earthquake magnitude of 7.5, or 7.0 for the Aleutian Island region, is used to trigger a tsunami warning for the United States.

Based on my research, M_W = 8.0 is considered a threshold value for tsunami generation, though there are salient examples—the 1998 New Guinea earthquake and tsunami—where smaller earthquakes (M_W = 7.0) produced deadly tsunamis. Earthquake magnitude does not have a direct relationship to tsunami generation because fault rupture area and water displacement are the key factors. For example, it is possible that a very large magnitude earthquake with a strong shear component might not produce a tsunami due to minimal vertical fault displacement. It is equally possible that a relatively small magnitude earthquake with strong vertical displacement might produce a tsunami. In any event, the false alarm rate is one of the chief justifications for DART system development and use. At the same time, earthquake magnitude is routinely monitored by a vast network of monitoring stations around the world and provides a rapid indication of seismic events capable of generating tsunamis.

I do not want to dwell on the limitations of the DART system, but it is important to recognize its capabilities for Southeast Asia and for our own coastlines. In 1985, the idea for DART was formed and steps were taken to prove that the sensors could detect and provide a meaningful early warning for tsunamis. In 1997, the National Tsunami Hazard Mitigation Program provided funding for DART development. Following successful tests, the system was put into operation in October 2003.

"It's more complicated than you might imagine," said Eddie N. Bernard, director of NOAA's Pacific Marine Environmental Laboratory in Seattle, Washington, where the warning system was developed, designed and built (Goldman, 2003).

"There are six tsunameters deployed in the Pacific Ocean today," Bernard said, offering the 'bare minimum' of an early warning system.

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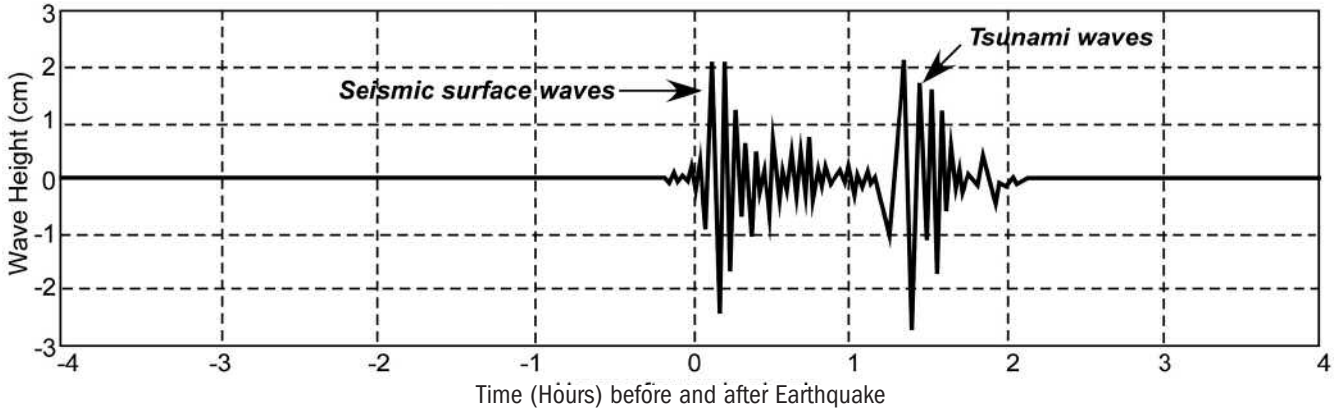

Figure 5. Gulf of Alaska Earthquake March 6, 1988 22:36 UTC, M_W=7.6 (modified from Milburn et al, 1996)

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"We probably need more like 20. The failure of any one instrument," Bernard said, "could leave a big enough hole in the detection network to create a serious delay in alerting communities of an oncoming tsunami."

Bernard's comments underscore the first limitation of DART. The warning network is only as effective as its areal distribution. Six BPR's are insufficient for the U.S. West Coast and 20 would be better. How many sensors would be appropriate for Southeast Asia? Equipment failure in an under-equipped network further compromises the effectiveness of the warning array.

Recently, the Bush Administration recommended a $37 million supplement to NOAA and the USGS to enhance tsunami detection capabilities (Wise and Howles, in press). The purpose of the recommendation is to increase to 25 the number of buoys and BPR's in the Pacific and to place 12 buoys in the Atlantic and Caribbean.

What has been the success of DART? Despite the NOAA citation of five Pacific tsunamis each year, there is only one referenced success for DART technology, and it is a negative example. On November 17, 2003 an Aleutian earthquake (M_W =7.5) was determined by DART methods not to be a tsunami-producing event. This reportedly saved Hawaii $68 million in lost business compared to a 1986 false alarm.

The current DART configuration was not operational until 2003, though an array of four bottom pressure recorders has operated in the Pacific since 1986. What about the other on-average five tsunamis per year in the Pacific from 1986 to 2004? I find no mention of whether these resulted in warnings or were determined to be false alarms.

Figure 5 shows data from one BPR unit located approximately 1000 km from the epicenter of a 1988 earthquake in the Aleutian Island region of Alaska. Two types of waves were detected: seismic surface waves that induced vertical motion of the sea floor, and tsunami waves that caused displacement of the sea surface (Milburn et al., 1996). DART pressure readings and interpreted tsunami indicators were not measured until 1.5 hours after the earthquake occurred (Figure 5). There is no mention of how much time elapsed between measurement and data transmission, processing and interpretation. This may have been adequate for a warning to Hawaii, 4000 km from the Aleutian epicenter, but it would have been useless for any of the hardest hit Indian Ocean countries on December 26, 2004.

A second limitation of the DART system is that data is only sent every hour (Perera, 2005). Had there been, for instance, a DART sensor in the Indian Ocean near the 2004 Sumatra earthquake epicenter, it might not have transmitted data until after the ensuing tsunami had already struck Aceh province and, possibly, at about the same time the wave arrived on the shores of Thailand.

"Our goal is to have results (a tsunami prediction) in 15 minutes or less" after an earthquake, said Titov, a mathematician and computer modeler who is working on tsunami forecasting among a small, elite group of tsunami researchers at the National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory in Seattle at Sand Point (Paulson, 2004).

A third limitation of DART is equipment failure, already alluded to in Bernard's comments above. In late January, 2005 two of the three DART buoys near Alaska were not working and one of the two off the U.S. Pacific Northwest coast was not transmitting data.

"Batteries can die, leakages can occur in the instrumentation package on the bottom, the buoy can have failure with rough seas —mechanically, things break," said David Oppenheimer, a U.S. Geological Survey seismologist involved in tsunami monitoring (Paulson, 2005).

I was unable to learn what type of processing is required once data has been received by NOAA ground stations in Alaska and Hawaii or what kind of communication protocols must be enacted before warnings are triggered. Is information from one BPR sufficient to determine tsunami strength and direction and to decide whether a warning is necessary?

It seems obvious that DART is, at best, unproven and is, at worst, inadequate. It is, like its military analogue the "Star Wars Missile Defense System", a great idea…if it only worked. DART technology has great promise but is not the solution for the Indian Ocean or any other region in its current state of development.

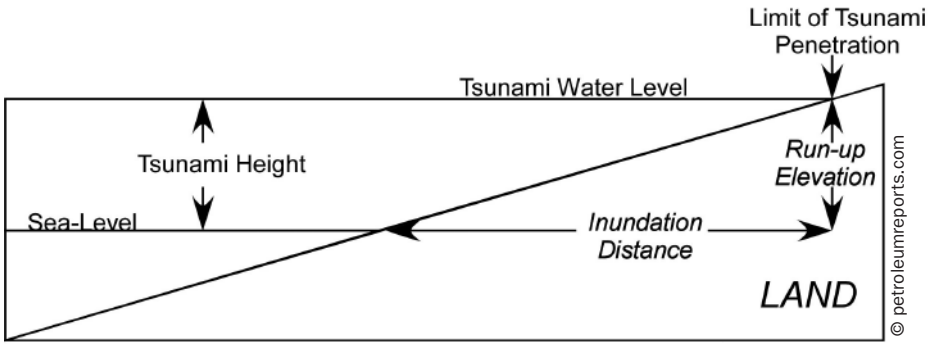

Figure 6. Tsunami Terminology (Modified from The December 26, 2004 Indian Ocean Tsunami)

Tsunami Detection and Warning Issues

The December 2004 Sumatra earthquake was the second strongest ever recorded and the tsunami it triggered was the deadliest in the history of the world. Prevailing opinion in the press and among world leaders is that earthquakes and tsunamis are unpredictable and are, therefore, outside the scope of normal emergency planning. It is statistically unlikely that another massive earthquake or tsunami will affect Southeast Asia for a while, though there were magnitude 6.5 and 7.0 tremors elsewhere in Indonesia during February 2005. This does not reduce the importance of taking steps to be better prepared for the inevitable next earthquake and tsunami in the Indian Ocean.

A tsunami warning system has been selected by ASEAN based on the DART model. The plan presented by UNESCO also includes access to international disaster response plans and strategies, hazard and weather forecasting capabilities, and tide and seismic monitoring data. Hopefully, the same plan will include critical protocols to permit communication of key information that could be used to warn inhabitants in case of a tsunami. These are positive and necessary measures that will provide somewhat greater security to the region than what currently exists.

The most immediate and effective measure that can be taken to avoid future loss of life from tsunamis is awareness training. The 1960 Hilo event showed that early warning is not enough.

People need to understand what a tsunami is, how to recognize signs of a tsunami, what to do in the event of an alert, and what steps are most likely to minimize danger of injury or death. Leaders in the Indian Ocean should simplify and distribute translations of USGS Circular 1187 to residents and community officials.

The most important thing to understand about tsunamis is:

- every meter that a person moves inland from the coastline exponentially improves the chance of survival. The force of a tsunami decreases with every meter it advances onto land.
- Every meter above sea level that a person can climb exponentially improves the chance of survival.

The USGS International Tsunami Survey Team (ITST) recently assessed the affect of the 2004 tsunami on Sri Lanka. Inundation distance (Figure 6)—the distance from the shoreline to the limit of tsunami penetration—varied from less than 50 m to more than 1 km (The December 26, 2004 Indian Ocean Tsunami, 2005). This means that if a person can move one km from the shoreline, he will likely experience no flooding.

Run-up elevation—the elevation above sea level of a tsunami at the limit of penetration (Figure 6)—measured by the Sri Lanka ITST varied from less than 3 m to more than 12 m. This means that if a person can get 3 to 12 meters above sea level, he will likely experience no flooding.

In low-lying coastal areas, the most effective way for people to be safe is to climb to an upper floor or the roof of a sturdy building. Municipal governments can quickly identify and designate buildings as tsunami shelters. A modest program of signs, pamphlets and media publicity can educate people about the locations of shelters nearest their homes and work. In small communities where tall or sturdy buildings do not currently exist, alternatives should be discussed and considered; if there is sufficient topographic relief, areas with high ground could be designated as shelter sites.

Evacuation routes should likewise be marked and publicized so that people can move outside the inundation distance if sufficient warning is feasible or if multistory buildings or topographic shelter sites are not available. If possible, transport vehicles could be dedicated at designated congregation points to facilitate rapid evacuation.

Above all, people must be educated and drilled about the important basics for tsunami survival found in U.S. Geological Survey Circular 1187. This information should be summarized in signs, passed out in pamphlets, publicized in local media, and taught in local meetings and in schools. In tourist centers, such as the coastal area of Thailand, this information should be given to all visitors on hotel check-in and should be reinforced with signs and other methods of public communication.

Telephone protocols must be implemented immediately among designated emergency agencies and international earthquake and tsunami monitoring centers and networks. Had such protocols have been in effect at the time of the December 2004 tsunami in Southeast Asia, many people could have been warned. As it was, many workers were aware of the danger but did not know whom to call.

A siren network should be immediately planned and implemented throughout the coastal areas of tsunami-prone regions. Sirens should be activated by dedicated agencies of the government based on a combination of seismological, meteorological and other means including buoy sensor networks. It will be necessary to establish threshold criteria that would trigger a siren alert. This will not be without risk of false alarms or of injury resulting from possible panic during an alert. These are important factors, but the alternative of no warning is clearly unacceptable.

Decision Dynamics for Tsunami Warning Systems

How are we to understand the decision making process that has lead to the current state of affairs in the Indian Ocean region following the death of at least 250,000 people in the tsunami of December 2004?

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The absence of a tsunami warning system or even the most basic communication protocols in Southeast Asia was due principally to apathy by the governments of that region. I made the point in my February "From the Editor" (Berman, 2005) that this situation arose, in part, due to an ignorance or unwillingness to acknowledge 40 years of advances in understanding of plate tectonics. It is now clear that leaders in Indian Ocean countries consistently resisted suggestions from local and international sources to implement some kind of warning system.

The principal reason for the state of affairs in December 2004 was the absence of urgency. A tsunami struck part of Indonesia in 1994 but its affects were not widespread in the region. The last serious tsunami resulted from the explosion of Krakatoa in 1883.

After the worst tsunami disaster in history, the leaders of Southeast Asia undoubtedly felt compelled to make a rapid decision to avoid criticism for taking no previous action on tsunami warning measures. Not knowing what they should do, they approved the first and only plan that was presented, without investigating if it was appropriate for their situation or if it would even work.

They decided to bring the horse inside their city walls.

They embarked on the road to Abilene.

The leaders of the Indian Ocean region almost certainly believed that, under the circumstances, any decision was better than no decision. There were probably many at the ASEAN meeting in Phuket who had questions about DART technology, its cost and how it compared to other approaches to tsunami warning. I imagine that the momentum to make a decision presented a daunting obstacle to analyzing the situation appropriately. Acting in a group, the Association of Southeast Asia Nations made a decision that involved higher risk and cost than most group members would have made individually.

No one wanted the fate of Laöcoon.

Speculation on Alternative Modes of Tsunami Genesis and Behavior

A different mechanism has been recently suggested for tsunami generation and propagation. What follows is highly speculative at the present but I mention and summarize the basics for completeness. I direct the interested reader to the February 15 issue of EOS for details (The Indian Ocean Disaster, 2005).

Information gathered during the December 2004 tsunami has prompted questions and re-thinking of causal modes for tsunamis and explanation of their destructive power. Tsunamis are caused by water column displacement during submarine earthquakes. Models assume that fault slip during an earthquake causes seafloor upheaval that, in turn, displaces the overlying water column (Berman, 2005).

In the case of the 2004 Sumatra earthquake, however, the rupture was deeply focused and might not have displaced the seafloor (The Indian Ocean Disaster, 2005). In addition, certain areas where great destruction occurred during the tsunami did not experience large amplitude surface waves. Other sources of kinetic energy might, therefore, be considered to explain both the genesis

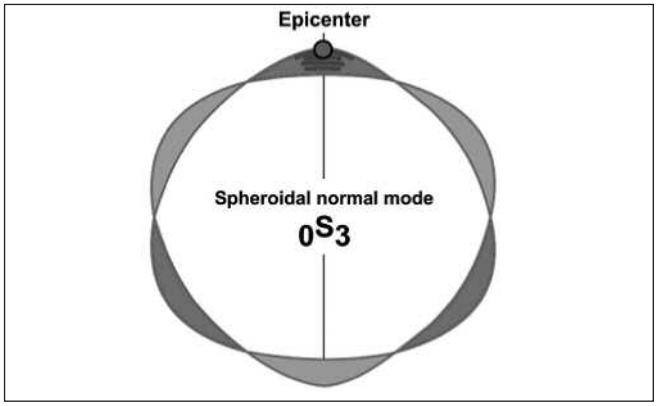

Figure 7. Spheroidal oscillations in the Earth. (from the Indian Ocean Disaster, 2005)

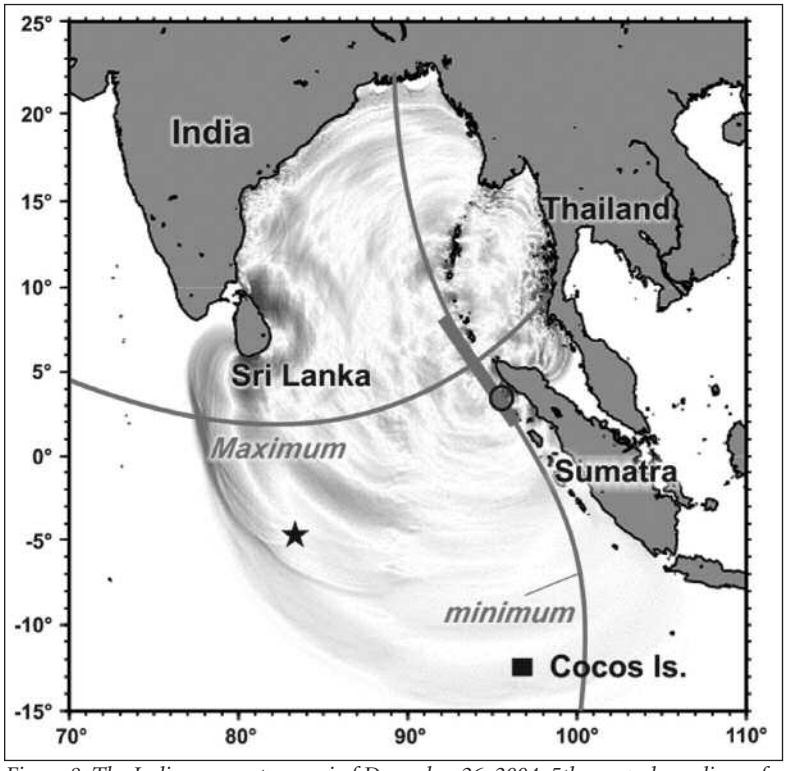

Figure 8. The Indian ocean tsunami of December 26, 2004. 5the map shows lines of maximum and minimum tsunami intensity (from the Indian Ocean Disaster, 2005)

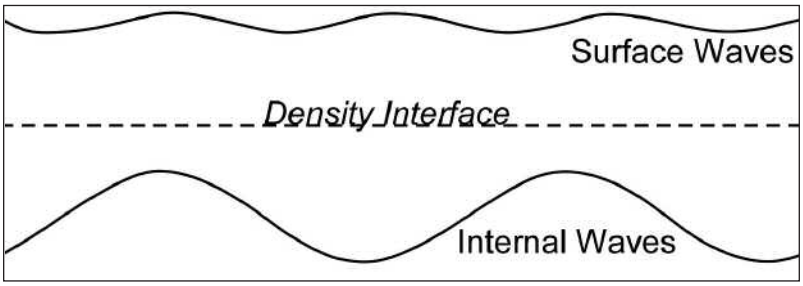

Figure 9. Internal waves

of tsunamis and the mechanism for their propagation.

It is possible that a powerful, deep-seated earthquake may produce free oscillations in the Earth similar to those that result from striking a bell with a hammer or flicking a water-filled balloon with your finger. Ringing a bell is an example of normal mode oscillation in which all particles move with the same frequency and phase. The bell rhythmically deforms in separate oscillation directions that produce ringing. Similarly, spheroidal vibrations in the Earth induced by deep rupture may excite oscillations of the seafloor that displace sea water to produce tsunamis (Figure 7).

Along parts of Sri Lanka, Bangladesh and the Cocos Islands, the December 2004 tsunami caused great destruction yet measured wave amplitudes were very small. For example, the coastal town of Galle, Sri Lanka was completely destroyed, yet the peak-to-trough amplitude of the tsunami wave that struck there was only 42 cm (The Indian Ocean Disaster, 2005). Explanation may be found in generation of internal waves.

The strongly directional propagation pattern of the 2004 tsunami is inconsistent with models that would predict patterns parallel to Sumatra coast along the trend of earthquake aftershocks (Figure 8). The wavelength of tsunami waves is much greater than the depth of the ocean so there should be significant internal water-column forces resulting from interactions with the ocean bottom. If the water column consists of layers of different densities, the interface between layers can undergo wave motion known as internal waves (Figure 9). "This mechanism could enable a wave-guide in the ocean and transmit tsunami energy at minimal dissipation. Because internal waves are produced by tidal currents flowing over the sloping seafloor, and the gradients tend to slope normal to the coast, such a mechanism will be directional normally to the trench" (The Indian Ocean Disaster, 2005).

What Should Be Done

Most people do not understand geological processes and only pay attention to them when our restless Earth creates peril for humans. Natural disaster produces great, if temporary, interest in how the Earth works. Political leaders struggle to quickly learn basic information so they can take action and relieve the pressure. Earth scientists can play a unique and important role at this moment in the history of the Earth because we understand the geological processes that most do not.

The world needs what we know.

If there ever were a situation and opportunity to demonstrate the value and relevance of geology in a practical, meaningful way, this is it!

It is not too late to modify the decision made in late January 2005 by the Association of Southeast Asian Nations. The Houston Geological Society should take the lead in calling for a meeting of world experts on earthquakes, tsunamis and disaster planning. The goal of this meeting would be to help the nations of the Indian Ocean in their difficult and complex task of planning for the inevitability of future earthquake and tsunami threats.

Why the HGS? The Houston Geological Society is small enough to act quickly, unlike more cumbersome national or international organizations. The HGS has already decided to dedicate Guest Night this year (June 11, 2005) to tsunami and earthquake awareness with USGS expert Dr. David Applegate's lecture, "Magnitude 9 Tsunamis and Earthquakes: Learning from Indonesia's Experience."

We are the largest local geological society in the world and, as such, have credentials to offer assistance. We are a broadly based earth science society and not, for example, a specifically petroleum- or environmental-based organization. Most of all, we have always been a bellwether group unafraid of setting a new direction in spite of risk.

I expect that I will receive more letters from Jakarta. I plan to send this article to György Busztin. I hope he will continue to ask me questions about the science of earthquakes and tsunamis and the technology we have to minimize danger and loss of life. Some have criticized my efforts as simplistic, presumptuous or just naïve. Perhaps they are right though I feel that the alternative of doing and saying nothing is unacceptable.

The medieval philosopher Hillel asked, "If not now, when? If not me, whom?"

Please join me. ■

Bibliography

The bibliography for this article may be found in the *Bulletin* Web version: /www.hgs.org/2005/April

"Letters to the Editor" has been abridged. See the *Bulletin* Web version for their full text: /www.hgs.org/2005/April

Art: The more research I do, the more amazed I am by what the early submarine cable guys achieved. They really had no idea what they were doing for about ten years, until the commission of inquiry into the numerous (and expensive) failures of the late 1850s published its report in 1861. This comprehensive report of the first ever inquiry into an industrial failure is a landmark document in the history of technology, somewhat unappreciated, I fear. The entire document of 520 legal-size pages is on line at: http://www.bopcris.ac.uk/bopall/ref5136.html

Between the commissioners and the witnesses, the cast of characters includes just about every businessman, engineer and scientist involved in the cable and electrical industries at that time. It makes interesting reading.

Incidentally, I sent your article to a 40-something friend in Boston who has a keen interest in science and technology, and she just emailed me: "This was the best article on plate tectonics I have ever read. I remember being fascinated by it in school. Surprisingly, it was being taught tentatively, and like something 'new' even then."
Regards,
Bill Burns

Arthur - I enjoyed your HGS *Bulletin* article about the Sumatra earthquake, really an incredible earthquake. As it is the first megathrust to have occurred since establishment of the global seismic network, there will be intense research on the event. In fact the American Geophysical Union (AGU) has already organized a special session at its spring meeting in New Orleans in May.

Sieh has studied coral growth patterns and has been able to map uplift associated with the 1833 and 1861 earthquakes, probably the last Sumatran megathrusts. He realized the dangers and was just starting to distribute information brochures to the local population. He gave a talk at the December 2004 AGU meeting "Mitigating the effects of large subduction-zone earthquakes in Western Sumatra" just 12 days before the quake. There is a fascinating series of letters written by Sieh from the field when he travelled to the area in January to service his GPS array. See http://today.caltech.edu/today/story-display.tcl?story%5fid=5903 for the first in a series of seven (the others are linked from this one). There were very few tsunami casualties on Simeulue.

There was another article about Indian Ocean tsunamis published last year. The September 2004 issue of *AusGeo News*, a magazine published by Geoscience Australia, has an article on tsunami threat to NW Australia. They did some modeling of the 1833 earthquake and concluded that this particular one didn't cause much of a tsunami in Australia, but the article, like yours, points out the danger of ignoring plate tectonics.
Best regards
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ian.o.norton@exxonmobil.com

Hi Arthur,
I want to thank you for the two great articles in the February *Bulletin*. The in-depth coverage of the SE Asian tsunami was simply a masterpiece! Also, your interview with Dr. Roy Dokka was equally thought-provoking and presented many insights to the problems of coastal subsidence and its quantification. As a 45-year resident of the city of New Orleans, I am always concerned about subsidence and flooding problems. Incidentally, I am active with LSU, presently serving as chairman of the College of Basic Sciences Development Council, and as a representative of the Geology and Geophysics Alumni. I've known Roy Dokka for many years and have carefully followed his research.

Thanks again for the two great articles!
Ed Picou
A 25-year member of the HGS

Dear Mr. Berman.

I like to congratulate you to your article in the February 2005 HGS *Bulletin* "The Sumatra Earthquake of 2004: Forty Years of Ignoring Plate Tectonics." The article brings a welcome fresh wind to the Society *Bulletin* and is well placed because our society is not a Houston Petroleum-Geological Society that many assume, but a Geological Society; and so we can and should discuss general/alternate non-petroleum geology as well. I am a petroleum geologist but just love to see more from other fields.

The only thing is that it appears highly questionable to what degree plate tectonics or their acceptance have anything to do with this earthquake and its horrible effect on people; at least it appears that we do not yet have the right answers here. Why is this earthquake just on a dot along a multi-1,000 mile zone within a basically identical geological framework? It would seem that a point-like event occurred, like the uplift of a magmatically-driven body of rocks (not necessarily tectonically driven magmatics, as your model requires). This would be in line with volcanic-magmatic events elsewhere in onshore Sumatra through the Tertiary.

And, subduction-related melting of basic crust can hardly ever lead to magmatism of granite, as you explain for Krakatau acidics. Therefore, we may need another explanation for the magmatism in Sumatra and elsewhere.

As one result of these thoughts one can hardly see "articulation of the plate tectonic model" would "prepare…. citizens for the inevitability of an event like this…..".

Plate tectonics or not, people know tsunamis for hundreds of years, and the guilt of Indian Ocean-surrounding countries (for not having tsunami warning system in place) lies more in their lack of acceptance of available technology that can be applied for sufficient tsunami warnings; it is not that they know nothing about plate tectonics (may be it would even be better for them if they don't) and therefore presumably have not organized a tsunami warning system.

This brings me to another point—are plate tectonics really valid today? Is this a theory that is proven or useful? I doubt that it is. In no case known to me are there unique one-sided data or facts that prove the plate tectonic theory as real, thus as useful.

We only can detect relative movements of plates, which leave always questions unanswered: It may not be subduction of the oceanic plate but obduction of the continental plate that is the basic mechanism (why else are there mantle domes and their final collapse as main tectonic events causing such regional features as Alboran Sea/Rif/Subbetics, Hungarian Plains/Carpathians, Black Sea, northern Gulf of Mexico/Ouachitas, Michigan Basin……?).

A synthesis of marine magnetics in the Southern Atlantic was published by the Canadian Geophysical Society; it practically killed plate tectonic symmetry of anomalies and probably because of this was never mentioned again to my knowledge.

Areal interpretations of marine magnetic fields offshore Alaska and offshore Greenland years ago showed the presence not of linear magnetic anomalies in oceans as had been published, but showed the presence of numerous positive and negative elongate anomalies of magnetic basement just like we see everywhere on land.

Thanks again for your article, it still opens up the world of general geology. Too bad that it needs the terrible earthquake of December 26, 2004 to shake some of responsible people and governments up.

Sincerely
J. Chris Pratsch
e-mail: jcp@hal-pc.org

SPRING TRAINING WITH AAPG!!

In addition to our exciting Spring Field Seminars, highlighted last moth, we have 3 Spring Short Courses to help you "get in shape" in your job skills!!

INTRODUCTION TO CONCEPTS AND TECHNIQUES OF PETROLEUM GEOLOGY

Date: April 4-6, 2005 **Location:** Dallas, Texas

Tuition: $700 (increases to $800 after 3/7/05), includes course notes and refreshments, field transportation and box lunch on field trip day

Instructor: Susan M. Landon, Independent Geologist, D...

CANCELLED

Who Should Attend

Geological technicians and other suppo... (landmen, attorneys, secretaries) with minimal background in geology who would benefit from an introduction to the principles of petroleum geology. Support staff are an integral part of corporate teams, and better understanding of industry goals and petroleum geology will allow these individuals to make a more significant contribution to the organization.

QUANTIFICATION OF RISK - PETROLEUM EXPLORATION AND PRODUCTION

Date: May 16-19, 2005 **Location:** Denver, Colorado

Tuition: $995, AAPG members; $1,095, non-members (increases to $1095/1195 after 4/18/05), includes course notes and refreshments

Instructors: Mark McLane, Ray Young, Rose and Associates, Midland and Dallas, Texas, respectively

Who Should Attend

Course is designed for geologists, geophysicists, engineers, and their managers. The course is also helpful for financial advisors, corporate planners, accountants, and state and federal government individuals.

NEW

OVERVIEW OF THE SUBSURFACE PETROLEUM GEOLOGY OF NORTHERN SOUTH AMERICA: FROM MATURE ONLAND SUPERGIANTS TO OFFSHORE FRONTIERS

Dates: May 23-24, 2005 **Location:** Houston, TX

Tuition: $785, AAPG members; $885, non-members (increases to $885/995 after 4/25/05), includes course notes and refreshments

Instructors: Paul Mann, Alejandro Escalona, Jackson School of Geosciences, University of Texas, Austin, TX

Who Should Attend

1) Higher- and mid-level management at major companies pondering the question of where to explore in northern South America. Venezuela and Trinidad jointly are one of the leading suppliers of oil and gas to the US market and will continue to do so into the 21st century.

2) Entry-level explorationists at major or smaller companies and independent consultants faced with the task of quickly "getting up to speed" in this large and geologically-complex region.

For further information, please contact the AAPG Education Department
Phone: 918-560-2650; Fax: 918-560-2678; e-mail: educate@aapg.org
Or log on to www.aapg.org/education/index.cfm

Monday, April 11, 2005

HGS General
Evening Meeting

Westchase Hilton • 9999 Westheimer
Social Period and Poster Session 5:30 – 7:00 p.m.
Presentation 7:00 p.m

Cost: $23 Preregistered members; $28 Nonmembers & 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#).

The April HGS General Evening Meeting will be a cocktail and hors d'oeuvres meeting followed by theater-style technical presentation. Please join us in experimenting with our meeting format and tell us if you like it.

The Trident Discovery: Play Opener of the Perdido Foldbelt, Deepwater Northwestern Gulf of Mexico

by ***Jon F. Blickwede, Michael J. DiMarco, Eddie Doré, Barry L. Gouger, James G. Hawkins, John W. Hidore, Garry Jones, John Sanclemente, Art Trevena and Skip Walden***
Unocal Corporation
Sugar Land, Texas

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

The successful drilling of Trident helped to increase industry's understanding of how to effectively manage the drilling of these features.

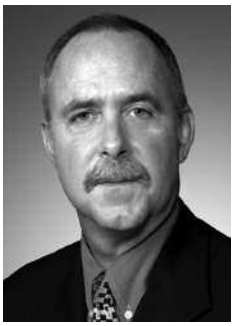
The successful drilling and discovery of significant hydrocarbons during 2001 at the Trident #1 wildcat in the Perdido Foldbelt of the Alaminos Canyon area proved the exploration viability of this deepwater frontier in the northwestern Gulf of Mexico. The well also set a new world record for water depth, at 9,687' (2,953 m), and was the first announced discovery in the Paleogene of the deepwater Gulf. Trident #1 reached a measured depth of 20,500' (6,248 m) in hemipelagic shales of the Lower Paleocene Midway Formation.

The Perdido Foldbelt is characterized by water depths reaching more than 10,000' (3,000 m) and difficult drilling conditions exacerbated by a low pore pressure to fracture gradient margin in some prospects. The successful drilling of Trident helped to increase industry's understanding of how to effectively manage the drilling of these features.

Geologic insights gained from Trident #1 include the discovery of high-quality light oil, the recognition of multiple hydrocarbon source rocks, the age of key seismic markers, and the presence of abundant and well-developed deep-marine sandstone reservoirs in the Upper Paleocene portion of the Wilcox Formation. Pre-drill prediction of reservoir presence utilized several seismic-based techniques, which have since been refined and improved with the calibration of well log data to the seismic response.

Exploration activity in the Perdido Foldbelt has steadily increased over the past three years and additional discoveries have been made. Because of the extreme water depths, remote location and technological challenges, cooperation amongst all operators will help ensure the economic development of this prolific trend by the end of the decade. ■

Biographical Sketch



Jon Blickwede is currently senior advising geologist with Unocal Corporation in Sugar Land, Texas, focusing on regional studies in the deepwater Gulf of Mexico and assisting with new ventures evaluations in Latin America. He earned a BS degree in geology from Tufts University in 1977 and a MS in earth sciences from the University of New Orleans in 1981.

Poster Session

Preliminary 3D Basin Model of the US Portion of the Perdido Foldbelt, Deepwater Northwestern Gulf of Mexico

by ***Marek Kacewicz, Jon F. Blickwede, Elizabeth A. Johnson and Tim E. Smith***
Unocal Corporation Sugar Land, Texas

Monday, April 18, 2005

Westchase Hilton • 9999 Westheimer
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 Nonmembers & 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#).

International Explorationists Dinner Meeting

by ***Sharma Vc. Dronamraju***
consulting geologist

Constraining Geological Heterogeneity in Offshore Sarawak Field, East Malaysia: Implications for Stochastic Modeling

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

D18 field is located about 20 km offshore from the coast of Bintulu, on Borneo island of East Malaysia. The field is located in the oil-rich Balingian province, at about 100 ft of water. Regional and local structural elements define the field to be about 40 sq.km in area, with approximately 1400 ft relief in the structure top of main reservoir unit (Cycle 2). A preliminary review of data and previous work and core descriptions in this study led to identification of key factors in the distribution of hydrocarbons. Eighty percent of oil has been produced from distributary channels and mouth bars of "Cycle 2" unit (C2M3.0–C2M3.4). Although exploration efforts started in 1920 in Balingian province, D18 hydrocarbons were discovered in 1981, with the first discovery Well D18-1, drilled on crest of roughly WNW–ESE trending anticline. Development drilling and previous field reviews divided the field into 21 fault-bound blocks separated by an interconnected fault network. Production declined over 19 years, with many wells currently idling. Preliminary data analysis, geochemical reports and RFT measurements in the field suggest that D18 field is vertically and laterally heterogeneous. A comprehensive re-evaluation of geology is considered before any further development activity.

Preliminary data analysis, geochemical reports and RFT measurements in the field suggest that D18 field is vertically and laterally heterogeneous.

D18 structure is one of the WNW–ESE trending anticlines formed as a result of transpressional tectonics in the Tertiary foreland basin, formed due to southward thrusting of Rajang oceanic crust under West Borneo basement. The sediment source for the Sarawak basins in general is believed to be Rajang Group, an accretionary prism formed as a result of subduction of Luconia block of South China Sea under the West Borneo basement.

Sequence development is related to simpler rules that govern the net effect in accommodation. A tentative high-resolution sequence stratigraphic model, constrained by biostratigraphy and palynology is constructed, which enabled a chronostratigraphic framework for reservoirs despite the intense deformation of stratigraphic units. Majority of the production is coming from the transgressive systems tract (C2M3.0–C2M3.4 reservoirs) below the mid-Cycle 2 Maximum Flooding Surface (MFS).

Biographical Sketch

SHARMA DRONAMRAJU received MSc from Indian Institute of Technology, Kharagpur (1984) and MS from Texas A&M University (1997). He worked with ONGC, India, as Exploration Geologist, Fugro as Offshore Geohazards Specialist, and Landmark Graphics-Halliburton as Consultant. In the last two years his work is focused on South East Asia. As Principal Consultant to Petronas-Carigali (Malaysia) on offshore brownfield assessments, he was responsible for revising the geology and sequence stratigraphy, revising and building reservoir models, and assessing hydrocarbon potential of fields in South China Sea.

He is an active member of AAPG, SEG and HGS. As a member for Continuing Education Committee of HGS he has organized several courses covering topics such as coal bed methane, geopressures and reservoir modeling.

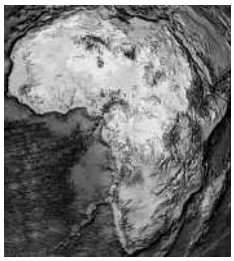
ANNOUNCEMENT AND CALL FOR PAPERS

The 4th HGS/PESGB International Conference on African E&P

Path to Discovery

Marriott Houston Westchase • 2900 Briarpark Drive, Houston

7–8 September 2005



This annual conference, which alternates between London and Houston, has become established as the primary technical E&P conference on Africa. Scheduled for 7–8 September 2005 in Houston, there will be a two-day program of talks along with poster presentations and exhibits from sponsoring companies. The conference covers all aspects of African E&P, with particular emphasis on new ideas for exploration, the geology of the continent, application of emerging technologies and case histories of discoveries.

The conference series, organised jointly by members of the International Explorationists Group of the Houston Geological Society (HGS) and the Petroleum Exploration Society of Great Britain (PESGB), will convene this year at the Marriott Houston Westchase (formerly Adam's Mark), which provides a spacious venue for posters and sponsors' exhibits in addition to an excellent facility for the two-day program of talks. The Marriott will also offer substantial discount for hotel rooms as the conference Headquarters Hotel.

The intention this year is to limit the program to two days by selecting the very best talks. Although the Deadline for Abstracts is May 31, submit a topic as soon as possible to ensure being considered.

Several abstracts and inquiries from sponsors have already been received; please submit topics or abstracts as soon as possible for consideration of the Technical Program Committee by email to africa05@sbcglobal.net.

Special thanks are due Exploration Consultants Limited (ECL) for their continuing support by committing to prepare the CD of the 2005 conference proceedings.

Details of the program, registration and hotel rooms will be maintained at the HGS website www.HGS.org in the Event Calendar for 7–8 September 2005.

Committee:
Houston: Al Danforth, Steve Henry and Ian Poyntz
London: Ray Bate, Duncan MacGregor, Mike Lakin and Val Clure

22nd Annual HGS SKEET SHOOT

Saturday, June 18, 2005

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 $60 PER SHOOTER FOR REGISTRATIONS RECEIVED BY FRIDAY, JUNE 10. AFTER JUNE 10, 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 832-366-1623 ext. 205 or tmccarroll@cheypet.com.

Tuesday, April 19, 2005

GSH
Luncheon Meeting

Westchase Hilton • 9999 Westheimer
Social 11:30 a.m., Lunch 11:45 a.m.

Cost: Members before 4/14/05 – $22, after 4/14/05 – $27;
Nonmembers & Walk-ups $27

Reservations: GSH Office 713-463-9477, fax: 713-963-9160,
E-mail office@gshtx.org or online reservations www.gsxtx.org

by ***Arthur E. Berman***
Director PetroleumReports.com and
Houston Geological Society Bulletin *Editor*

The Northern Sumatra Earthquake of 2004: Forty Years of Ignoring Plate Tectonics

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

The December 26, 2004 Northern Sumatra Earthquake has been recently recalculated to be magnitude Mw = 9.3, making it the second largest earthquake in recorded history along with Maullín, Chile (1960). Due to the magnitude of the December 2004 earthquake and ensuing tsunami, these types of events are widely viewed as beyond the range of scientific predictability or probability.

More disturbing than the presumption that the Sumatra earthquake and tsunami were beyond probabilistic determination is the nearly universally held notion that what is needed is a deep-ocean-buoy monitoring and warning system, like the Deep Ocean Assessment and Reporting of Tsunamis (DART) network in the United States and Japan. The DART system is extremely expensive and has never been proven to predict a tsunami. Initial tsunami waves arrived in 15–30 minutes of the earthquake in Aceh Province, Sumatra, one hour in Thailand, and two hours in Sri Lanka and India. The frequency of DART transmission (once every hour) and associated processing time is inadequate to have provided meaningful warning for any of the areas most affected by the 2004 tsunami in the Indian Ocean.

In the case of the tsunami that destroyed Hilo, Hawaii, following the 1960 Maullín, Chile earthquake, ample warning was provided from seismological information alone, yet many deaths and injuries occurred due to lack of awareness about the behavior of tsunamis.

Tsunami detection is, after all, a second derivative approach. Why not focus on the causal mechanism—earthquake—which is something we can measure very effectively and quickly? I believe that an appropriate, immediate response to the Indian Ocean tsunami disaster should focus on.

1. Immediate awareness training about tsunamis for all coastal residents of the Indian Ocean region,
2. Immediate implementation of a seismological first-warning system that uses existing monitoring stations in the region along with an inexpensive network of coastal sirens, and
3. Assessment of the feasibility and cost benefit of a deep-ocean-buoy tsunami warning system like the U.S. DART network. ■

Biographical Sketch

Arthur E. Berman is Director of PetroleumReports.com and current editor of the Houston Geological Society *Bulletin*. He has an MS in geology from The Colorado School of Mines and has worked in the petroleum industry since 1978 doing geological and seismic interpretation.

Tuesday, April 19, 2005

The Sofitel Hotel • 425 Sam Houston Pkwy. North
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: $31 Preregistered members; $35 Nonmembers & 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 Northsiders Luncheon Meeting

by ***Daniel L. Orange***
AOA Geophysics Inc

Advances in Hydrographic Systems Aid Hydrocarbon Exploration and Geohazard Evaluation

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

In this presentation, we will discuss the application of hydrographic techniques to both exploration and geohazards.

In exploration, a hydrographic survey can be the foundation of a two-stage field program whose objective is to reduce exploration risk or rank prospect areas, typically in a block with little previous exploration and no known discoveries.

Exploration

In exploration, a hydrographic survey can be the foundation of a two-stage field program whose objective is to reduce exploration risk or rank prospect areas, typically in a block with little previous exploration and no known discoveries. We typically begin with an analysis of satellite-derived synthetic aperture radar (SAR) images, which can image sea surface slicks. Slicks may provide an indication of hydrocarbon seepage to the sea surface, and the location of the slicks can be tied to the possible seafloor origination points of the seeps. Our approach for the first stage of the survey is to combine a hull-mounted survey system (multibeam) with other acquisition programs that are amenable to a "mowing the lawn" survey strategy; this can include the acquisition of gravity, magnetics and sub-bottom profiler. The combination of these data sets can define the tectonic fabric within a block, indicate the presence **Northsiders** *continued on page 31*

Northsiders continued from page 29

of volcanics or the location of thick basin sequences, image shallow faults and provide an indication of fluids at and immediately below the mud-line.

The process of seepage elevates subsurface geochemical boundaries that are normally buried to, or near to, the sediment-water interface. Cores that contain evidence of hydrocarbons may provide direct samples of the fluids present in a basin without drilling and may provide information regarding source, maturity, and degradation. The distribution of seeps on the seafloor may provide information about the extent of the hydrocarbon system or information regarding migration conduits.

Geohazards

For deep water geohazard applications, there have been two trends that have revolutionized deepwater geohazard surveys and interpretations. First, there have been improvements in the acquisition systems themselves, allowing for very high frequency (high resolution) acquisition in water up to 4000m deep. Secondly, there have been dramatic improvements in delivery platforms, including the commercial availability of autonomous underwater vehicles (AUVs) that get the sensors close to the seafloor without the need for a tether for deepwater surveys.

Summary:

Geophysical systems that can be used to evaluate the impedance/roughness and the shape (bathymetry) of the seafloor, and to identify zones of potential fluid expulsion, range from near-bottom, high frequency (up to 100s of kHz) to regional hydrographic survey systems (10s of Hz), to exploration seismic data (10s to <100 Hz).

In deep water, the application of hydrographic survey technologies to exploration may have a disproportionately high impact due to the high cost of drilling, and the comparitively low cost of surveying and sampling. The high cost of facilities and drilling in deep water also drives high-resolution acquisition of hydrographic data from near-seafloor platforms, and integration of these data with high-resolution seismic surveys and geotechnical boreholes. 100% maps of the seafloor, for both exploration and geohazards, allows for more robust process-oriented interpretations to be made of a field area, reducing exploration risk or improving the geohazard evaluation. ■

Biographical Sketch

Daniel L. Orange is President and CEO of AOA Geophysics Inc., with offices in Houston, Austin, and Moss Landing, California. He is also a research associate at the University of California, Santa Cruz. He is a marine geologist and geophysicist with bachelor's and master's degrees from MIT, and a PhD from U.C. Santa Cruz. He is also chairman of the AAPG Program Committee for the Offshore Technology Conference, where he is working to increase the geoscience component of the meeting.

New Geologic Time Scale 2004

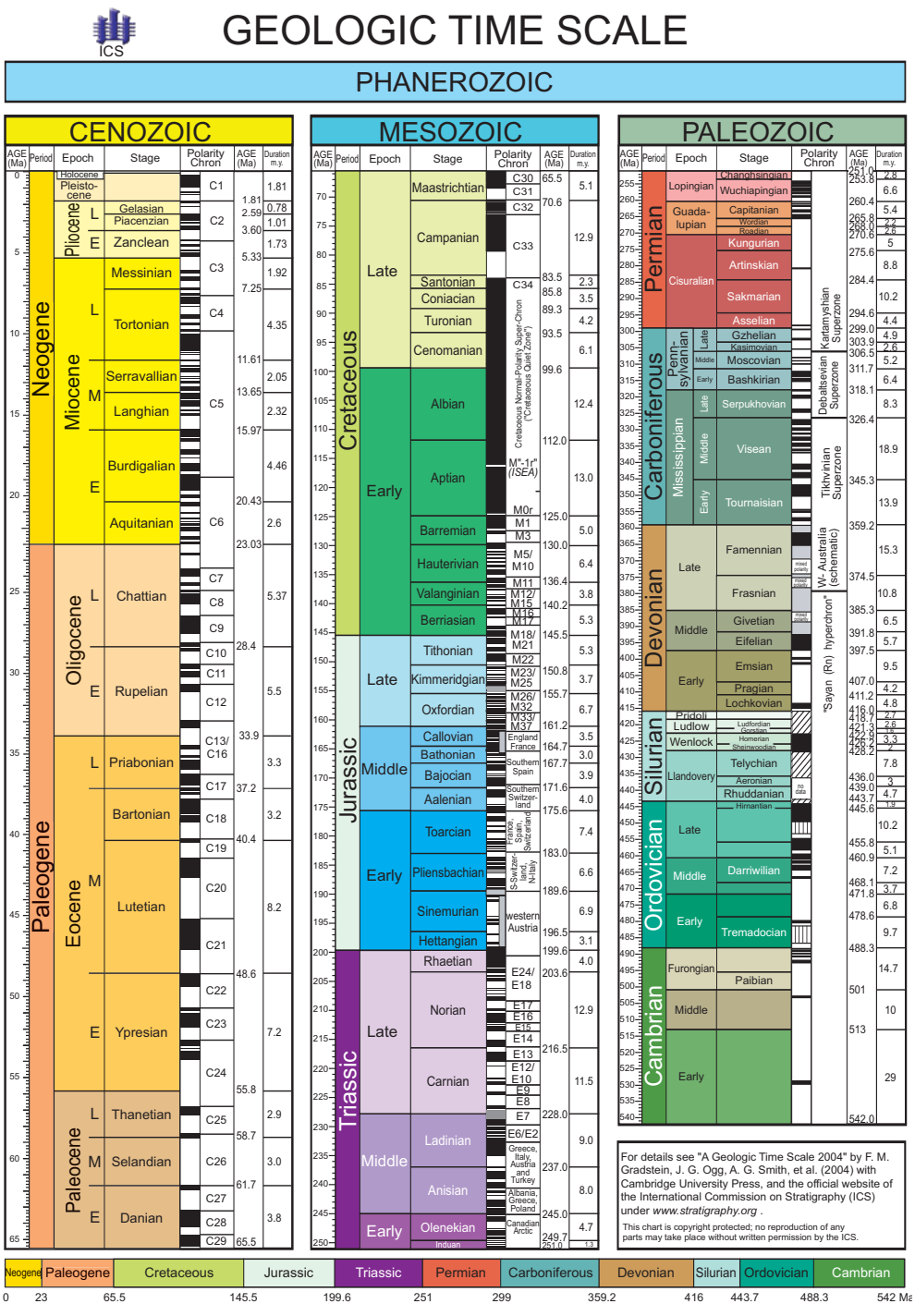
by ***Ian Davison,*** *Earthmoves Ltd.*

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

A new geologic time scale is to be officially published in February 2005 (Gradstein et al. 2004). A brief explanatory note has already been posted on the official website of the International Commission on Stratigraphy at http://www.stratigraphy.org/scale04.pdf.

A large number of specialists working with astronomical cycles, radiogenic and stable isotopes, stratigraphy, palaeontology, magnetic polarity reversals and geomathematics have co-operated on the mammoth task of incorporating all the new data that has been acquired since the time scale that was published by Harland et al. (1990). A few highlights of the new timescale are listed below:

- Nearly 50 of the 90+ Phanerozoic stage boundaries are now defined, compared with 15 in 1990.
- More accurate and more precise age dating, has over 200 Ar/Ar and U/Pb dates (> 50% were not available for GTS 89)
- ^{40}Ar-^{39}Ar ages have had to be recomputed due to the revised ages for laboratory monitor standards.
- Orbital tuning of cyclic sedimentary sequences has been employed. For example, the Neogene astronomical scale is directly tied to the Present giving an accuracy of 20 k yr (assuming the cycles are all correctly identified).
- Improved mathematical/statistical techniques were used to combine zones, polarity chrons, stages and ages to calculate the time scale.

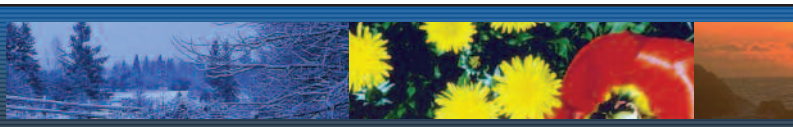


For details see "A Geologic Time Scale 2004" by F. M. Gradstein, J. G. Ogg, A. G. Smith, et al. (2004) with Cambridge University Press, and the official website of the International Commission on Stratigraphy (ICS) under *www.stratigraphy.org* .

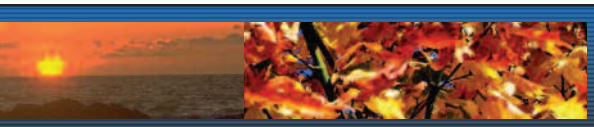
This new time scale represents a great step forward in our geological knowledge, and we are greatly indebted to its authors for the time and effort spent on this unprecedented collaborative project. It is hoped that individuals, companies and organizations will adopt the new timescale as soon as possible. Otherwise we are left to grapple with using a confusion of different out-dated timescales which can be more than 10 million years different at certain stage boundaries. A comparison of these differences is available at www.stratigraphy.org, to see just how far out you may be using an outdated scale. The World Wide Web and e-mail should help ensure that all geologists are aware of this important new development in geology, even before it is officially published, so please pass the message on to your colleagues.

Wall charts of the new timescale can be purchased at the Commission for the Geological Map of the World website address: http://ccgm.free.fr/index_gb.html ■

April 2005



Sunday	Monday	Tuesday	Wednesday
NOW you can make your reservations on-line at www.hgs.org	**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.**		
3	4	5 **HGS Executive Board Meeting**	6 **PHI OIL HISTORY SYMPOSIUM** Petroleum History Institute Morgantown, WV
10 **AAPG SW SECTION MEETING** Budding New Technologies Fredricksburg, TX	11 **HGS General Evening Meeting** by Jon Blickwede *"Trident Discovery: Play Opener of the Perdido Foldbelt, Deepwater Northwestern Gulf of Mexico"* See page 23	12	13
17	18 **International Explorationists Dinner Meeting** by Sharma Vc. Dronamraju, *"Constraining Geological Heterogeneity in Offshore Sarawak Field, East Malaysia: Implications for Stochastic Modeling"* See page 25	19 **GSH Luncheon Meeting** *"The Northern Sumatra Earthquake of 2004: Forty Years of Igoring Plate Tectonics"* See page 27 **Northsiders Luncheon Meeting** *"Advances in Hydrographic Systems Aid Hydrocarbon Exploration and Geohazard Evaluation"* See page 29	20
24	25 **North American Explorationists Dinner Meeting** by Marc Edwards *"Is There Anything Useful to be Learned by Correlating Several Thousand Well Logs from the Middle and Upper Wilcox of South Texas?"* See page 39	26	27 **HGS General Luncheon Meeting** by Harold Illich *"Oil Mixing in the Deep Shelf and Deep Water Areas of the Gulf of Mexico"* See page 41



GeoEvents

Thursday	Friday	Saturday
Members Pre-registered Prices: General Dinner Meeting . . . . . .$25 Nonmembers walk-ups. . . . . $33 Env. & Eng. . . . . .$25 Luncheon Meeting . . . . . .$30 Nonmembers walk-ups. . . . . $33 International Explorationists . . . . . .$25 North American Expl. . . . . .$25 Emerging Technology $25	1	2
7	8	9
14 **GeoWives Spring Field Trip** See page 64	15	16
21 **SIPES Luncheon Meeting** by Dan Tearpock *"Certification of Petroleum Reserves Evaluators"* See page 37 **HGS Astros Night** See page 52	22	23 **NeoGeos Galveston Beach Cleanup** Menard Park, Galveston TX **HGS Road Rally** University of Houston See page 59
28	29	30

Upcoming GeoEvents

May 9
HGS General Dinner Meeting
Cindy Yeilding, "How Workstations Killed Geology"
5:30 p.m.,Westchase Hilton

May 12
HGA Auxiliary Luncheon
Briar Club

May 16
International Explorationists Meeting "Libya"
5:30 p.m., Westchase Hiliton

May 17
Northsiders Luncheon Meeting
Larry Zara, "The Wilcox - Outcrop to Deep Water"
5:30 p.m., Sofitel Hotel

May 17
Environmental and Engineering Meeting
5:30 p.m., Guadalajara Hacienda Restaurant

May 20
HGS Reserves Course Part III
William M. Kazmann
Petroleum Reserves—Avoiding Write-downs: Overview of Recommended Engineering Practices
8:00 a.m., Marathon Oil Corporation, Edward P. Travis Conference Center
See page 50

May 25
HGS General Luncheon Meeting
Pat Gratton "Barnett Shale Play: Big and Getting Bigger"
11:15 a.m., Petroleum Club

Thursday, April 21, 2005

Petroleum Club • 800 Bell (downtown)
Social 11:30 a.m., Lunch 11:45 a.m.

Cost: $30 for members and affiliates pre-registered by 12 noon Tuesday 19th January (No-shows will be billed.). $35 for non-members, guests, and walk-ups.

Make reservations by telephone (713-651-1639), Fax (713-951-9659), Web-site (www.sipes-houston.org), or e-mail (bkspee@aol.com) to B. K. Starbuck-Buongiorno by 12 noon Tuesday before the meeting.

SIPES
Luncheon Meeting

*by **Daniel J. Tearpock***
Chairman/CEO
Subsurface Consultants & Associates, LLC.

Certification of Petroleum Reserves Evaluators: The Time Is Now!

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

During the past 2 years there has been a lot of publicity regarding reserves writedowns and concerns about the reliability of reserves disclosures. Reserves are an important part of everyday life in the energy industry. Beginning with Enron, the recent major reserves writedowns and the passing of the Sarbanes-Oxley Act by the United States Congress in 2002, not to mention investor confidence in our oil and gas industry, the time has come to explore the establishment of a certification program for both petroleum geoscience and engineering reserves evaluators. An exploratory intersociety committee has been formed by the American Associations of Petroleum Geologists (AAPG) and the Society of Petroleum Engineering Evaluators (SPEE) to evaluate establishing a voluntary program for the Certification of Petroleum Reserves Evaluators. The intent of a certification program is to improve the industry reserves estimation process and the ultimate reserves numbers. It has the potential to provide the financial community with a greater confidence in the estimates of oil and gas reserves and the opportunity to develop better standards in both reserves estimation and disclosure. ■

Biographical Sketch

Daniel J. Tearpock Chairman/CEO is Chief Executive Officer of Subsurface Consultants & Associates, LLC (SCA). He is the co-author of three textbooks, *Applied Subsurface Geological Mapping* (1991), *Quick Look Techniques For Prospect Evaluations* (1994) and *Applied Subsurface Geological Mapping With Structural Methods* (2002) and numerous technical articles. He holds a bachelor's degree in geology from Bloomsburg University, 1970; and a master's in geology from Temple University, 1977. He is a Certified Petroleum Geologist and State of Texas Licensed Geologist.

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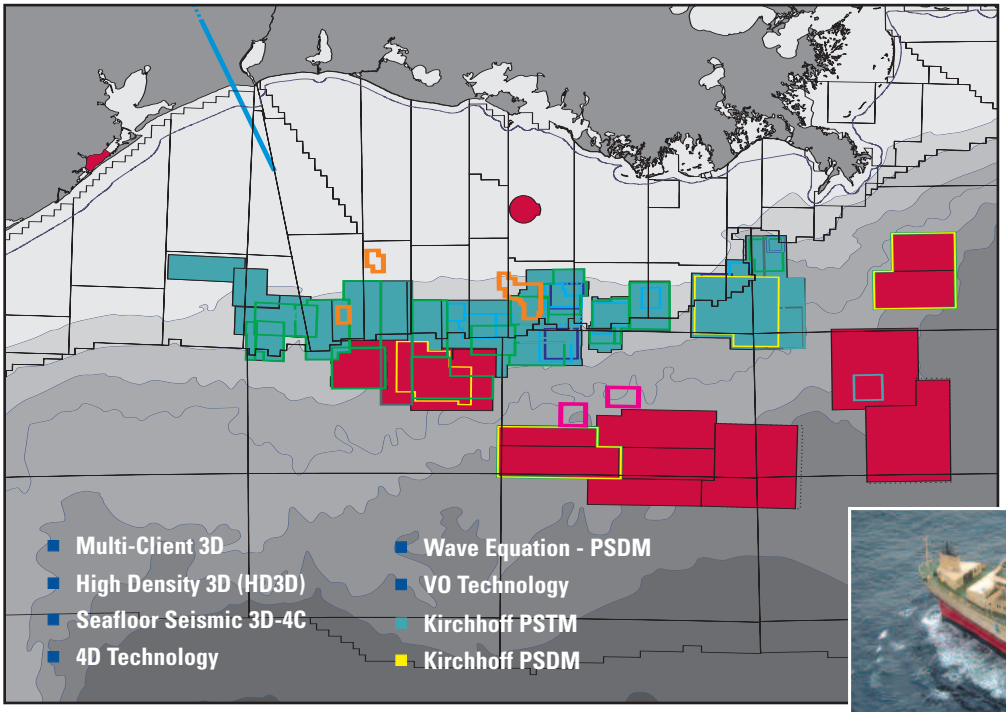

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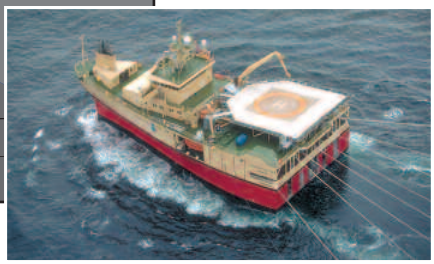

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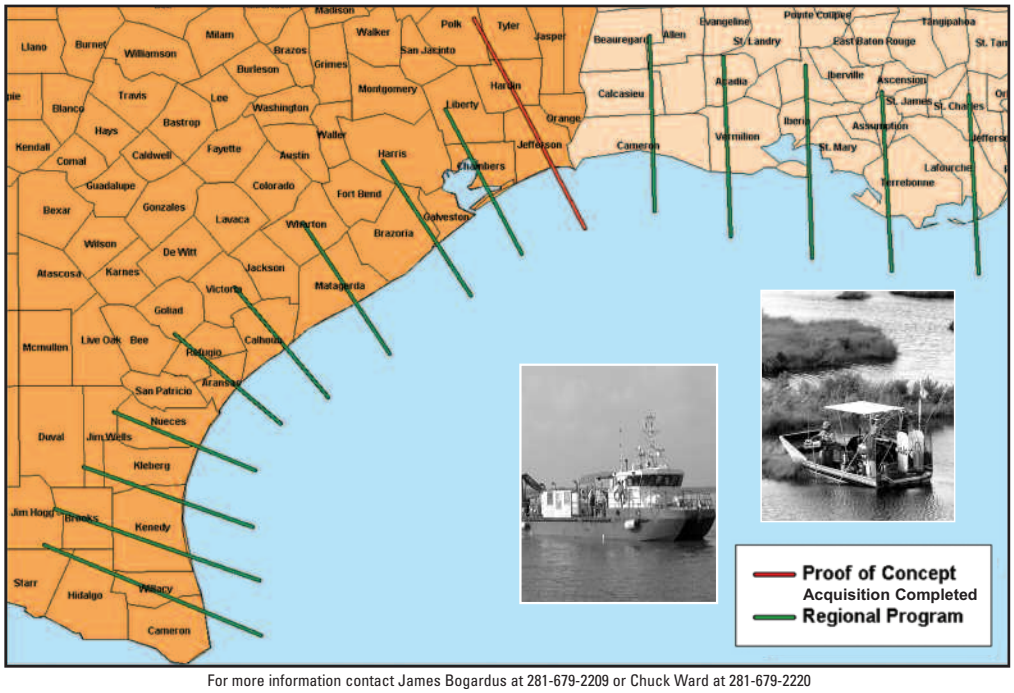


For more information contact James Bogardus at 281-679-2209 or Chuck Ward at 281-679-2220

PGS ONSHORE

738 Highway 6 South, Suite 900 ■ Houston, Tx 77079 ■ Tel: 281-589-6732 ■ Fax 281-752-2444

Monday, April 25, 2005

Westchase Hilton • 9999 Westheimer
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 Nonmembers & 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#).

North American Explorationists Dinner Meeting

by ***Marc B. Edwards***
Consulting Geologists, Inc.
Houston, Texas

Is There Anything Useful to be Learned by Correlating Several Thousand Well Logs from the Middle and Upper Wilcox of South Texas?

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

Now that thousands of feet of Wilcox sand have been encountered in a handful of wells in the Perdido and Mississippi Fan foldbelts in the deepwater Gulf of Mexico, the onshore Wilcox has new relevance.

After correlating several thousand wells from the Middle and Upper Wilcox of South Texas and creating numerous maps and cross sections, has any additional light been shed on the stratigraphy, facies and shelf margin architecture of the updip Wilcox?

Familiar Wilcox deltas along the basin margin and the submarine fan deposits encountered on the deepwater basin floor are enormous areas of deep potential, both onshore and offshore. Attempting to delineate the sediment fairways across the slope and predicting the nature of sands within those fairways addresses two geological risk factors that concern this evolving play.

Biographical Sketch

Marc B. Edwards, is president of Marc B. Edwards Consulting Geologists, Inc., Houston, Texas. He has been an independent consulting geologist based in Houston for 20+ years. Prior to that, he worked for the Norwegian Continental Shelf Institute in Oslo and Trondheim, Norway, and for the Bureau of Economic Geology in Austin. He holds a BS degree in geology from The City College, New York, and a PhD from Oxford University.

Wednesday, April 27, 2005

Petroleum Club • 800 Bell (downtown)
Social 11:15 a.m., Lunch 11:45 a.m.

Cost: $30 with advance reservations, $35 for walk-ins, space available ($15 for Emeritus and Honorary).

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 General Luncheon Meeting

by ***Harold Illich, John Zumberge, and Stephen Brown***
GeoMark Research
Houston, Texas

Effective March 30th, the price of the HGS General Luncheon increased to $30 and $35 ($15 for Emeritus and Honorary).

Oil Mixing in Deep Shelf and Deep Water Areas of the Gulf of Mexico

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: /www.hgs.org/2005/April

Oil-oil mixing in deeper water areas of the Gulf of Mexico Basin is demonstrated using geochemical data obtained from more than 1300 oils. Oils that are compositionally intermediate between well characterized end-member families, and oils that have experienced bacterial alteration but contain "fresh" gasoline-range chemistries, are interpreted to have originated through oil-oil mixing. Some oils possess both compositional patterns.

Occurrence of mixed oils indicates overlap of petroleum systems, a phenomenon directly impacting exploration risk. Additionally, total oil volumes might be anticipated to be greater in basinal areas where the Cretaceous and Jurassic systems overlap.

Oils possessing compositions similar to those occurring naturally have been produced in the laboratory by mixing Cretaceous oils from shale-rich sources occurring in the basin with Jurassic oils from carbonate-rich sources. The map distribution of compositionally intermediate oils additionally supports a mixing interpretation.

"Fresh" oils derived from Gulf of Mexico Cretaceous sources tend to contain minor amounts of sulfur and moderate to high API gravities. Oils from Jurassic sources tend to have larger sulfur contents and lower average gravities. Mixing of these end members can be viewed as degrading the quality of the Cretaceous oils, or as improving the quality of the Jurassic oils.

Occurrence of mixed oils indicates overlap of petroleum systems, a phenomenon directly impacting exploration risk. Additionally, total oil volumes might be anticipated to be greater in basinal areas where the Cretaceous and Jurassic systems overlap.

Mixing resulting from multiple migration-accumulation episodes may mainly characterize basins where the principal vector of fluid movement is vertical rather than lateral. ■

Biographical Sketch

Harold Illich has thirty-six years of experience in petroleum exploration, basin analysis, and exploration geochemistry. At GeoMark Research, he has lead or been a member of teams responsible for the evaluation of oil and rock geochemical data for numerous basins on a world-wide basis. Before joining GeoMark, he worked for Oryx Energy Company or its predecessors.

Harold holds a BS from the University of Texas at Austin and a MS from the University of Montana.

Candidates for the 2005–2006 Executive Board

Ballots for the 2005–2006 Candidates will be mailed separately. Pleaase take time to read the candidates' profiles and vote for your Executive Board members.

President-Elect (two candidates)

Kara Bennett

Education:
BS Geology, Florida Atlantic University
MS Geology, University of Florida

Experience:

2000–present	Consulting Geologist, International and Domestic
1997–2000	Geologist, Landmark
1994–1997	Consulting Geologist, International
1989–1994	Senior Exploration Geologist, Amoco
1988	Summer Intern, Mobil
1987	Summer Intern, Amoco
1982–1985	Senior Geologist, Gulf Oil
1980–1981	Geophysicist, U.S. Geological Survey
1979–1980	Uranium Geologist, Bendix

Professional Affiliations:
AAPG, HGS, EAGE, Registered Texas Geologist

Honors and Awards:
HGS President's Award

Professional Activities:

2004–2005	HGS Vice President
2003–2005	HGS Advisory Committee
2004–2006	AAPG 2006 Convention Continuing Education Chairman
2004	APPEX Continuing Education Course Organizer
2000–2004	HGS Continuing Education Committee, Chairman 2002–2004
2002–2005	AAPG House of Delegates
2000–2003	Producer of HGS videos, Legends in Wildcatting
1996–2000	HGS Personnel Committee-Initiated and maintained Jobs Hotline Web site
1998–2000	HGS Bulletin Editor-Elect, Editor

Comments:
The HGS is the world's largest local geological society and one of the most long-lived, currently in its 82nd year. It has reached these milestones because it serves a very useful purpose, to connect geoscientists in Houston to each other both in the technical and social arenas.

We support students with scholarships, foster public education through Earth Science Week and the HMNS Volunteer Geologists programs, provide networking opportunities and excellent talks at 60+ technical **Kara Bennett** *continued on page 51*

Steven Brachman

Education:
BS Geology, Eastern Illinois University
MS Geology, Pennsylvania State University

Experience:

1997–present	Pogo Producing Company
1995–1997	Southwestern Energy
1993–1995	Araxas Exploration
1992–1993	Independent Consulting Geologist
1990–1992	Wintershall Energy
1984–1990	SOHIO/BP Exploration
1981–1984	Gulf Oil

Professional Affiliations:
HGS
AAPG (CPG #4279)
Onshore Exploration Independents (OEI)
Registered Geologist - Texas

Professional Awards:

2001	HGS Distinguished Service Award

Professional Activities:

2001–2004	AAPG - DPA Advisory Board
2000–present	AAPG House of Delegates
2000	GCAGS Convention Academic Liaison Committee Chairman
1997–2001	HGS Finance Committee Chairman
1995	AAPG Convention Volunteer Committee Chairman
1993–1994	HGS Secretary
1992–1993	HGS Treasurer
1991–1992	HGS Treasurer-Elect
1991	GCAGS Convention Personnel Placement Committee Chairman
1988–1991	HGS Personnel Placement Committee Chairman

Comments:
When Paul Hoffman called a few weeks ago, I thought he was going to ask me if I wanted to look at a prospect his company was showing. Instead, I was surprised when he asked me to accept the Society's nomination for President. After a great deal of thought, I agreed. To be nominated for President of the HGS is a tremendous honor, and not one that I take lightly. I believe that the job of President encompasses more than just leadership of the Board of Directors. It requires an understanding of how the HGS functions and a vision **Steven Brachman** *continued on page 51*

Candidates for the 2005–2006 Executive Board *(continued)*

Vice-President (two candidates)

Steven A. Earle

Education:
BS Geosciences, University of Arizona
MBA, Houston Baptist University

Experience:

2003–present	Sabco Oil and Gas, Geophysicist
2000–2003	BP, Senior Geophysicist
1994–2000	Vastar, Senior Geophysicist
1980–1994	Arco Oil and Gas, Area Geophysicist
1974–1980	Amoco, Geophysicist

Professional Affiliations:
HGS, AAPG, SEG, GSH

Professional Activities:

2002–Present	Chairman, North American Explorationists
2003–Present	AAPG House of Delegates

Comments:
I consider myself most fortunate to work in the exciting field of exploration geology and alongside of so many excellent people during my career. So it is truly an honor to run for office in such a vibrant Society. If elected, it would be my privilege to serve as your Vice President and continue the tradition of bringing outstanding talks to the entire geological community. I look forward to tackling the challenges of maintaining the HGS as the premier organization that it is. ■

Linda R. Sternbach

Education:
BS Geology, Syracuse University, 1981
MS Geology, Rensselear Polytechnic, 1984

Experience:

2002-present	Kerr-McGee Oil and Gas, senior geophysicist, Gulf of Mexico
1998–2002	Globex Energy, geophysical advisor–West Africa, Australia
1997–1998	British-Borneo, consulting geophysicist
1996–1997	Agip Petroleum, consulting geophysicist
1995–1996	Coherence Technology, consulting geophysicist
1993–1995	Pennzoil, sequence stratigraphy consultant
1984–1993	ARCO Oil and Gas, staff geologist, GOM

Professional Affiliations:
HGS, SEG, GSH, AAPG (CPG#5286), SIPES affiliate, registered geophysicist, Texas

Honors and Awards:

2003	HGS President's Award
1995	HGS "Rising Star" Award

Professional Activities, HGS:

2003–2005	HGS Guest Night—(2005-Tsunami theme; 2004-Mars Rover theme; 2003-Apollo 17 theme)
2002–2004	Technical Program chair and co-chair, International Explorationists' Group
2000–2001	SIPES Continuing Education chairman
2000–2001	HGS/GSH Directory, chairman
1999–2000	SIPES Technical Program chairman
1999–2000	International Group, treasurer
1998–2002	SEG Leading Edge magazine, Editorial Board
1997–1998	HGS Bulletin Editor
1996–1997	HGS Bulletin, Editor-Elect
1994–1995	Poster Session, chairman

Comments
As a long-time member of HGS (since 1985), I am honored to be asked to run for Vice-President. My chief goal, if elected, would be to present the HGS membership with an exciting program of speakers. I believe that topics that will draw members to meetings are case studies of oil and gas fields, new discoveries, and talks on new technological advances that members can use in exploration and production.

I have experience putting together technical programs as part of the International Explorationists' Group, and with the SIPES organization. I am also proud **Linda R. Sternbach** *continued on page 49*

HGS Earth Science Teacher of the Year Award

It is time to nominate this year's HGS Teacher of the Year. The winner will receive a $1000 cash award from the HGS and will represent the HGS at the Section level of the GCAGS. The GCAGS Teacher of the Year winner will receive another $1000 and be nominated to the national level of AAPG. The AAPG Teacher of the Year will be granted $5000 plus an all expense paid trip to the 2006 AAPG national convention to receive the award. If your nominee is interested in pursuing this award, have them check out the GCAGS and AAPG for details, qualifications and forms. Forms and other required materials need to be sent to Awards Chairperson at the HGS Office by May 1, 2005. For more information go to the GCAGS web site at: www.gcags.org/teacheroftheYear.htm and the AAPG site at: foundation.aapg.org/tchr_of_year_award/index.cfm.

Candidates for the 2005–2006 Executive Board *(continued)*

Secretary (two candidates)

Susan M. Black

Education:
MS Degree in Geology, Texas Tech University
BS Degree in Geology, Texas A&M University

Experience:

2003–present	Newfield Exploration Co., Geologist
2001–2002	Contour Energy, Sr. Staff Geologist
1992–2001	Wagner & Brown, Ltd., FX Consulting, Hardy Oil & Gas USA Inc., Enron Oil & Gas Company, Consultant
1985–1991	Energy Development Corporation, Geologist
1980–1985	Superior Oil Company (Mobil Oil Company), Geologist

Professional Affiliations:
Licensed Professional Geoscientist, State of Texas # 1265
AAPG Certified Petroleum Geologist, # 4376
HGS

Professional Activities:
1991–present HGS Undergraduate Scholarship Committee

Comments:
I am very honored to be nominated for the position of Secretary of the Houston Geological Society. Throughout my career as a geoscientist in Houston the HGS has been a source of support, pride and good friends. As a member of the Undergraduate Scholarship Committee for a number of years, I have seen how HGS takes an active role in encouraging our future geoscientists with scholarships, mentoring, and educational programs. As a consultant I also benefited from the educational programs, seminars, and networking opportunities that HGS provides. I want to work within the HGS to help maintain the high level of educational and mentoring programs that those before me have developed and supported. This is an excellent opportunity to give back to the geoscience community that has so richly supported me throughout my career. ■

Beverly Blakeney DeJarnett

Education:
MS Geology, Pennsylvania State University
BS Geology, minor in French, University of Wyoming

Experience:

2003–present	Research Associate, University of Texas, Bureau of Economic Geology's Houston Research Center
1992–present	Consulting sedimentologist (BBD Consulting)
1986–1992	Geologist, Union Pacific Resources Company, Fort Worth, TX, and Denver, CO

Professional Affiliations:
HGS, AAPG, SEPM, RMAG, RMS-SEPM

Honors and Awards:
SEPM Excellence of Oral Presentation Award - AAPG/SEPM Annual Meeting, 1986

Professional Activities:

2004	SEPM Short Course/Field Trip Chairman for AAPG/SEPM Annual Meeting
1998–1999	President, Fort Worth Geological Society
1997–1998	President-elect, Fort Worth Geological Society
1996–1997	Treasurer, Fort Worth Geological Society
1997	SEPM Short Course/Field Trip Chairman for AAPG/SEPM Annual Meeting

Comments:
I am honored to be asked to run for secretary of HGS and feel strongly about serving my local geological society. HGS provides so many benefits to its members, and I am grateful for the top-quality technical presentations, the continuing education courses, and the many opportunities for networking and socializing with fellow geoscientists. I have a lot of experience serving as an officer for a geological society and would work diligently with the other officers of HGS to ensure that HGS continues to provide its members with the excellent quality of programs and services its members have come to expect. At the end of the day, it feels good to be able to give something back to the society. ■

Call for OTC Volunteers

The HGS and GSH are locating for several volunteers to assist the Arrangements Committee for the upcoming OTC Conference from May 2 through May 5. A half-day volunteer will receive full registration for the convention and a free parking pass good for the entire convention. Please contact Lynn Coyle at 281-578-6397 daytime, or 281-491-2294 evenings, or email lynn@velocitydatabank.com or Claudia Ludwig at 713-723-2511 or email at petra@hal-pc.org.

Candidates for the 2005–2006 Executive Board *(continued)*

Treasurer-Elect (2 candidates)

Cheryl Desforges

Education:
MBA Finance/International Business/Decision & Information Sciences, University of Houston
MS Physical Science/Geology, University of Houston CL
BS Geology, Texas Christian University

Experience:

2004–present	Ryder Scott Company / Consultant
1998–2004	Randall & Dewey, Inc.
1995–1998	Environmental Evaluation Partners, Inc., President
1989–1995	Consultant in both the Petroleum and Environmental Industries
1982–1989	J.M. Huber Corp.
1979–1981	Diamond Shamrock Corp.
1977–1979	Sonat Exploration Co.
1975–1977	Atlantic-Richfield Co.

Honors and Awards:

1990	Arthur J. Ehlmann Award for TCU Geology Alumni
1974	Sigma Gamma Epsilon, geology honor society, University of Houston
1974	Gayle Scott Award for the Outstanding Geology Senior, Texas Christian University

Professional Affiliations:
Licensed Professional Geoscientist, State of Texas # 2174
American Association of Petroleum Geologists - Certified Petroleum Geologist #2925
American Institute of Professional Geologists - Certified Professional Geologist #4851
Geological Society of America
Houston Geological Society
Society of Exploration Geophysicist
Society of Petroleum Engineers

Professional Activities:

2004–2005	HGS Finance Committee Chairman
2003–2005	HGS Continuing Education Committee, Chairman 2004-2005
2002	Volunteer Liaison Committee AAPG Convention
1985–1989	HGS Publication Sales Committee Chairman
1982–1984	AIPG Screening Committee

Comments:
I would be honored to serve as Treasurer-Elect and subsequently as Treasurer of the HGS. I recognize the need for a constant stream of funds to finance programs which benefit our membership. However, while sustaining **Cheryl Deforges** *continued on page 49*

Michael C. Allison

Education:
MS Geology. University of Tennessee at Knoxville
BS Geology. University of Miami at Coral Gables

Experience:

2005–present	GDM, Geoscienist and Cy-Fair College, Geology Instructor
2000–2004	Landmark Graphics, R&D Product Geoscientist
1999–2000	Chevron, Project Manager, GOM Y2K Contingency Project
1997–1999	Chevron, IT Manager
1992–1997	Western Australia Petroleum, Supervisor, Exploration Computer Support
1990–1992	Chevron, Senior Geologist
1987–1990	Chevron, Petroleum Geologist
1985–1987	Chevron, Development Geologist
1993–1985	Gulf Oil, Development Geologist

Professional Affiliations:
AAPG, HGS and GSH

Professional Activities:

2004–Present	HGS Northsiders Treasurer
2004–Present	HGS Continuing Education Committee

Comments:
It would be an honor to serve as the Treasurer-elect of the HGS. As the largest local geological society in the world, the HGS has a very important role to play here in Houston and throughout the world. It is a privilege to be a member and volunteer in this great organization. I look forward to being actively involved with the HGS for many years to come. ■

Candidates for the 2005–2006 Executive Board *(continued)*

Director (four candidates) *Vote for two candidates*

Michael Demimg

Education
MS Geology, University of Missouri (Rolla)
BS Earth Science, Northwest Missouri State University

Experience:
2004–present Swift Energy
2003–2004 Burning Dog Exploration
2000–2003 Phillips
1999–2000 Consultant
1978–1999 Amoco Reduction Co.

Professional Affiliation:
AAPG, HGS, SIPES, Tulsa GS, NAPE

Professional Activities:
1991–1997 Chairperson, HGS Membership Committee
1997–1998 HGS Treasurer-elect
1998–1999 HGS Treasurer
1999–2000 HGS Poster Sessions
1999–2000, 2003–2005 AAPG House of Delegates
2000–2002 Chairperson, Tulsa Geol. Society, Continuing Education
2003–2004 Chairperson, HGS Awards Committee

Comments:
I find the HGS is the best way to keep in contact with former co-workers, meeting new people, keeping up with trends in the industry, and always learning new things. So when asked if I would run for HGS Director, how could I say no? The HGS is one of those organizations where an individual can really make a difference. If elected, I will strive to do my part in keeping the HGS an effective volunteer organization.

James D. (Jim) Doyle

Education:
BS Geology, University of Texas at Austin
MA Geology, University of Texas at Austin
PhD Geology, Colorado School of Mines

Experience:
2002–present Eni Petroleum
1999–2002 Consultant
1985–1999 Sohio/BP Exploration
1980–1985 Scientific Software Intercomp
1976–1979 Cities Service Co.
1974 Cities Service Co,

Professional Affiliations:
HGS, AAPG, AAPG CPG # 5660, Texas Licensed Professional Geologist # 3460

Professional Activities:
1996–2003 Emerging Technologies Committee, committee chairman 2002–2003

Comments:
Over the course of my career, I have benefited very much from the programs sponsored by the HGS. It is an honor to be asked to run for the Board of Directors. If elected, it will be a privilege to serve.

HGS Guest Night will be June 11, 2005

at the Museum of Natural Science.

The topic will be tsunamis and earthquakes

explained by Dr. David Applegate of the USGS.

Candidates for the 2005–2006 Executive Board *(continued)*

Director (four candidates) *Vote for two candidates*

George E. Kronman

Education:
MBA (1987), University of Houston,
BS Geology (1976) and MS Geology (1979), State University of New York

Experience:

2000–present	Landmark Consulting and Services, Director, Prospect Generation/Field Development
1997–2000	Andersen Business Consulting
1980–1997	Amoco

Professional Affiliations:
HGS, AAPG CG#3922, SPE, GSA, Sigma XI, Texas PG# 5388

Honors and Awards:

1990–1991	HGS Distinguished Service Award
1987–1988	HGS President's Award

Professional Activities:

1993–1998	AAPG International Liaison Committee
1993–1998	AAPG House of Delegates
1992–1994	AAPG Bulletin Associate Editor
1991	GCAGS Convention Awards Chairman
1989–1991	HGS Bulletin Editor
1988–1989	HGS Bulletin Committee
1988	AAPG National Convention Matson Award Committee Co-chairman
1986–1988	HGS Undergraduate Scholarship Committee Trustee
1985–1988	HGS Awards Committee Chairman
1982–1984	HGS Boy Scouts Committee
1982	GCAGS Convention Associate Editor

Comments:
The Houston Geological Society is uniquely positioned to help geoscientists in the Houston area learn more, expand their professional contacts and become more productive. I am honored to be asked to run for the Director position on the Executive Board. If elected, I pledge to use all my skills to help the HGS serve its membership. ■

Erik P. Mason

Education:
BA Geology, Principia College
MS Geology, Oklahoma State University

Experience:

2002–present	Shell E&P, Houston, Exploration Team Leader, Western Deepwater Gulf of Mexico
1988–2002	Shell E&P, New Orleans
2001–2002	Area Exploration Manager, Western Gulf of Mexico
1996–2001	Staff and Senior Staff Geologist, Western and Eastern Gulf of Mexico Exploration
1988–1996	Senior and Staff Geologist, Production
1982–1988	Phillips Petroleum, Houston, Bartlesville

Professional Affiliations:
HGS, AAPG, NOGS, AAPG Certified Petroleum Geologist

Honors and Awards:

2000	AAPG Certificate of Merit (Hedberg Conference co-convener),
2000	AAPG Certificate of Merit (general chairman, AAPG Convention in New Orleans)
1999–2000	New Orleans Geological Society Outstanding Service Award
1998	AAPG Certificate of Merit (Reservoir Development Committee chairman)
1995	New Orleans Geological Society President's Award
1994–1995	Houston Geological Society "Best Speaker"
1992–1993	New Orleans Geological Society "Best Paper"
1987	Houston Geological Society Presidents Award

Professional Activities:
HGS (member since 1984)

2003	APPEX Advisory committee
1986–1987	Chairman, Continuing Education Committee
1984–1987	Continuing Education Committee

New Orleans Geological Society (member since 1989)

1996–1999	AAPG delegate representing NOGS
1997–1998	Vice President
1995–1997	Continuing Education Committee, chairman

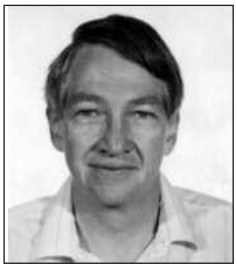
AAPG (member since 1981, CPG, EMD, DEG, DPA)

2003–2004	Vice President
2000–2001	Budget Review and Finance Committee
1999–2000	General chairman, Convention and Annual Meeting, New Orleans
1999	Hedberg Conference co-convener, Horizontal Wells - Focus on the Reservoir

Erik P. Mason *continued on page 49*

Candidates for the 2005–2006 Executive Board *(continued)*

Editor-Elect (one candidate)



William D. "Bill" Rizer

Education:
1970 BS geology - Boston College - Chestnut Hill, MA
1976 MS geophysics - Boston College - Chestnut Hill, MA
2002 Certificate On-line Documentation - Houston Community College - Houston, TX

Experience

1997–present	Geoscience and Technical Writing Consultant - W. D. Rizer Consulting, Houston, TX
1983–1997	Senior Research Scientist - Conoco, Inc., Houston, TX
1976–1983	Research Geologist - Cities Service Co., Tulsa, OK

Professional Affiliations
AAPG, SEG, SPE, AGU, Sigma Xi, STC, AAP, ISRM

Recent Awards
SEG Best Paper in Geophysics, 1995
Co-Chairman of the New Publications Committee, HGS, 2001-present
Invited keynote speaker, Edinburgh Anisotropy Project Workshop, 1999

Comments:
The position of Editor, HGS Bulletin, is at once both intimidating and inviting. It will most certainly be a challenge to continue delivering the level of excellence that the Bulletin has achieved these past few years and to which we readers have grown accustomed. But, the editorship also presents the opportunity to contribute to the Society, the science, and the Houston community.

The Bulletin is an excellent vehicle for informing the membership of new advances and techniques in geology as well as relevant advances in geophysics and engineering. The editorship offers exciting possibilities for partnering and interaction with sister organizations like GSH and SPE.

There is much that we geologists, as both scientists and educated citizens, have to offer our community. The Bulletin is an excellent platform for promoting our discipline and advancing understanding of geology, particularly as it affects our community. These are all reasons why I welcome the opportunity to serve as Editor. ■

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Linda R. Sternbach — *Candidate for Vice President*

of the attendance of more than 400 people at the last three years of Guest Night, and have used that experience to learn about event planning, advertising, and meeting budgets. I would look forward to working with the HGS Board and the HGS special interest groups on improving technical meetings and increasing attendance at lunches and dinners. ■

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Cheryl Deforges — *Candidate for Treasurer*

our desired program level, our society is currently experiencing a period of unexpected negative financial pressures. In the position of Treasurer-elect, through collaboration with our members and financial advisors, I will strive to identify and implement innovative income ideas, while maintaining conservative fiscal responsibility of our existing funds. ■

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Erik P. Mason — *Candidate for Director*

1998–2004	Convention Coordinating Committee (committee chairman 2001–2004)
1996–2001	Technical Program Committee
1993–2000	Reservoir Development Committee (committee chairman 1997–1998)

Technical session co-chair at Annual meetings in San Diego (1996), Dallas (1997), Denver (2001), Houston (2002) and the International Conferences in Birmingham (1999) and Cancun (2004)

1996	GCSEPM Research Conference Program Advisory Committee Member

Comments:
It is an honor to be a candidate for the HGS Board of Directors. If elected, it would be a privilege to serve the society.

The Houston Geological Society is the largest local geological society in the world with a focus on serving the membership. HGS members are energetic, enthusiastic and unselfish in the time and effort they dedicate to the society. The large numbers of excellent technical and professional programs offered by HGS are an indication of that dedication. If elected I would serve with energy and enthusiasm contributing in whatever ways could help the membership the most. Having recently served on the AAPG Executive Committee during a time when AAPG is struggling to grow and change provides a background that may be beneficial as HGS continues to grow and change. ■

HGS CONTINUING EDUCATION COMMITTEE PRESENTS

Part Three of the Mini-series

Petroleum Reserves—Avoiding Write-downs:
An Overview of Recommended Engineering Practices

by

William M. Kazmann and Edward P. Travis
LaRoche Petroleum Consultants, LTD

Friday, May 20, 2005 • 8 a.m. – 4 p.m.
Registration Table opens at 7:30 a.m.

Marathon Oil Corporation Conference Center
5555 San Felipe Road • Houston, TX 77056

Reserve write-downs in 2003 and 2004 have increased attention of financial analysts, investors, rating agencies, banks, the U.S. SEC and corporate boards to the process of estimating and reporting reserves. Both geologic and engineering technical errors can contribute to erroneous reserve estimates.

- Learn basic reservoir evaluation techniques from performance to volumetric analysis.
- Learn which common engineering errors contribute to the inaccuracy of reserves estimates.
- Learn the recommended engineering practices to avoid these reserve pitfalls.
- Learn the fundamentals of economic evaluations and their impact on reserve volumes.

Register at www.hgs.org or find a registration form on the HGS Website: /www.hgs.org/2005/April

Candidates for the 2005–2006 Executive Board *(continued)*

continued from page 43

Kara Bennett — *Candidate for President-Elect*

meetings a year, provide inexpensive, high-quality continuing education programs, sponsor Technofest and the Africa Symposium, publish a superb monthly Bulletin, provide one of the most consistently active, useful job-hunting web sites in the geosciences, and have a wide range of social events and fundraisers. We do it all with a tiny but hardworking office staff and a large and vibrant group of volunteers.

The essential role of the HGS in connecting geoscientists to each other will become even more valuable in the future, as fewer individual geoscientists with greater responsibilities have more demands on their time, and as the business continues to move into a "free-agent" system. I believe it is important to reach out to a younger generation of geoscientists as those who went before reached out to us, and to mentor the geoscientists who will follow us. I believe it is valuable to work together as volunteers, and to provide the volunteers and committee chairs encouragement to be creative and find new ways to make the organization useful.

I am honored to be nominated as President-elect, and later President. In that role, I will encourage our Board, committees and office staff to continue the excellent work they currently do and provide the logistical and creative support to allow them to do it, within a framework of fiscal responsibility. I will also ask our members to look into the future and volunteer to recruit and mentor the next generation. I am grateful for the opportunity to serve in such an important manner, and I will do my best to ensure that HGS remains a vigorous and useful organization into the future. ■

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Steven Brachman — *Candidate for President-Elect*

as to how the Society should continue to evolve. After three years on the Board as Treasurer and Secretary, as well as eight years as a Committee Chair, I have been privileged to observe and help shape how our Society operates.

Needless to say, the HGS does face some serious issues, mostly centered on our shrinking membership. I believe that it is incumbent for the Board, and therefore the President, to thoroughly understand the differences between what can be done and what we would like to do, and make sure that the former does not get sacrificed for the latter.

Regardless of any future uncertainties, the HGS offers a great variety of technical and social opportunities for its members to participate. It also contains a tremendous group of volunteers that makes all of our varied activities possible. I believe that the President and the Board shoulder a shared responsibility towards the volunteers and the membership, to ensure that the HGS remains a viable and vibrant Society. I am privileged to be considered for another leadership position in the HGS. ■

Co-volunteer of the Month: Arlin Howles

This month's Co-volunteer of the Month is Arlin Howles. Arlin is the Vice President and Principal Geoscientist for Tidewater Environmental Services, Inc., where he performs management of hydrogeologic and geologic investigations, hazardous waste site remedial investigations and feasibility studies. Additional responsibilities include groundwater monitoring system planning and installation, aquifer testing and analysis, and assessment of contaminant transport as well as representing clients and negotiating with local, state and federal regulatory agencies.

Arlin received a Bachelor's degree in geology from Edinboro State University, and a Master's degree in geology and geophysics from the University of South Carolina and did post-graduate studies at Wright State University. ■

Co-Volunteer of the Month: Henry Wise

This month's Co-volunteer of the Month is Henry Wise. Henry is the Technical Services Manager at Eagle Construction & Environmental Services, L.P. where he performs environmental site assessments, remediation and emergency response to spills, leaks and other releases. Henry is co-chairman of the HGS Government Affairs Committee and writes "Governmental Update" for the HGS Bulletin along with Arlin Howles. He is also a founding member of the Environmental & Engineering Geology Group (back when it was only a committee) and is on the Continuing Education Committee.

Henry received his Bachelor's degree in geology from Boston University in 1975 and his Master's degree in geology from The University of Texas at El Paso in 1977. ■

Scholarship Benefit Party Raises the Roof for Students

The article has been abridged. See the *Bulletin* Web version for the full text /www.hgs.org/2005/April

The first annual Scholarship Benefit "Rock Dance" held on February 5 was a rousing success. Over 110 participants enjoyed terrific food and great music at the 43rd floor rooftop of the Petroleum Club. Everyone appeared to have a wonderful time. Over 50 silent auction items were bid upon netting $3500 in donations. With the combined matching contribution from the AAPG-GCAGS, over $7000 will be donated to the W.L. Calvert Memorial and HGS Foundation scholarship funds. The scholarship fundraiser committee comprising Marsha Bourque, Deborah Sacrey, Carl Norman, Andrea Reynolds, Mary Kae Dingler, Natalie Uschner and I enjoyed putting this event together. We are already eyeing plans for an even bigger and better event in 2006. Additional volunteers to assist in this worthy cause are most welcome.

Just because this event is concluded does not mean that the fundraising for the HGS scholarships is over. We shall continue throughout the year because the AAPG-GCAGS will match our contributions up to $10,000. What an achievement if we can reach such a target!

Thanks go to all of those that attended this inaugural event and to the donors of silent auction items. Special thanks are to those that gave up so much time and effort to make this happen from the Scholarship Benefit Committee. ■

These kind sponsors and fellow HGS members provided the silent auction items to make this event a success. We thank you and are grateful for your generosity.

A2D-TGS/Nopec
Alley Theater
Bill Howell - Spartan Energy
Brandon Pierce "Calvin Murphy Basketball USA"
Cellarini Energy Staffing
Ciro's Italian Restaurant
Continental Airlines
Core Lab
Cypresswood Golf Club
Deborah Sacrey - Auburn Energy
The "Derailers" band
Elizabeth Fisher
George Klein
H&H Music
Hearthstone Country Club
Hilton Americas-Houston Hotel
Houston Astros
Houston Ballet
Houston Comets
Houston Grand Opera
Houston Rockets
Houston Symphony
Houston Texans Improv Comedy Theater
James and Bonnie-Milne Andrews
Janet Combes
Julie Gill
Kingwood Country Club
Law Offices of James F. Andrews
Michael and Marsha Bourque
Old Orchard Golf Club
Petroleum Club of Houston
Radio City Music Theater
Ray Benson of "Asleep at the Wheel" band
Red Volkeart of "Merle Haggard" band
Sherrie Sartain
Stephen and Stephanie Levine
Tasteful Expressions
Ted Roddy

HGS Undergraduate Scholarship Foundation Presents Seven Scholarships

The article has been abridged. See the *Bulletin* Web version for the full text and images: /www.hgs.org/2005/April

The HGS Undergraduate Scholarship Foundation has been providing scholarships to deserving students since 1984. To date, over $108,000 in scholarships have been awarded. This year the Foundation awarded seven scholarships totaling $10,500. Chairman John Adamick presented scholarship winners at the February 7 HGS dinner meeting. Universities in the undergraduate scholarship program are Lamar University, Sam Houston State University, Stephen F. Austin State University, Rice University, Texas A&M University, the University of Houston, and the University of Texas.

Prior to the dinner meeting, several of the students and professors also participated in a tour at Unocal. The purpose of the tour was to show the students what it is like to be a petroleum geologist in today's industry. Many thanks are extended to Unocal for generously hosting this event. The Foundation intends to make the tour a regular part of our scholarship program and invite other local companies to participate. If you believe that your company might like to host students in the future, please contact John Adamick at jada@tgsnopec.com.

Melissa Halick
University of Texas

Heather Berglund
University of Houston

Anne Herrin
Texas A&M University

Nivedita Thiagarajan
Rice University

Marcy Stonecipher
Stephen F. Austin State

Lynn Holik
Sam Houston State University

Shawn Miller
Lamar University

W.L. and Florence W. Calvert Memorial Scholarship Fund

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

The W.L. and Florence W. Calvert Memorial Scholarship Fund provides scholarships to graduate students from nearby universities. Each year a total of over $10,000 worth of scholarships are presented to deserving individuals. The HGS and the Memorial Scholarship Fund Board gratefully acknowledge the following contributions to the Fund in 2004. The three categories of contributions are Patron ($500 or more), Donor ($100 to $500), and Contributor (less than $100). ■

Donors:

Justine Boccanera (in memory of D. Van Siclen)
Arthur Mullenax
Daniel L. Smith
Zinn Petroleum Company

Contributors:

Steve Adams
Robert Alexander
Michael M. Anderson
Antoine International
Lawrence Baldwin
Jack R. Banttari
Kenneth Beeney
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Lynn Duncan
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John Polasek
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Walter Pusey
James Ragsdale
John Ross
John C. Scheldt
William Schroeter
Theresa F. Schwarzer (in memory of R. Schwarzer)
Arthur E Jr Smith
Daniel L. Smith
George T Smith
Frank Sonnenberg
Amy E. Sullivan
Michael Sweet
Mark A. Taylor
Edwin L. Trice (in memory of E. L. Trice, Jr)
Randall W. Wells
Williams Geological (in memory of June Lathon)

TBPG Exam News

by ***Dave Crane***

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

Two examinations are required to obtain a Professional Geoscientist license in Texas:

- The Fundamentals of Geology Examination (8:00 a.m. to noon, 110 questions)
- The Practice of Geology Examination (1:00.p.m. to 5:00 p.m., 80 questions)

To request registration for either portion of the exam from TBPG, applicants must submit:

- TBPG license application,
- 3 professional reference forms,
- 2 personal reference forms, and,
- Resume that reflects at least five years of work experience and 30 hours of course work in geology. Work experience is waived on the first part of the examination. ■

Continuing Education Announcement

"Petroleum Reserves - Avoiding Write-downs Part 4: An Overview of Recommended Petrophysical Practices" is being planned for next September. Obtaining accurate net pay counts from correct petrophysical analysis is one of the basic ingredients of accurate reserve estimations. Learn about red flags and pitfalls, as well as how to avoid them. This course will review actual case histories from the real world. Watch the HGS *Bulletin* and website for the publication of the exact date and location of this course, as arrangements are finalized.

Book Review

George O. Chandlee *Source Environmental Sciences, Inc.*

Novacek, M., 2002, Time Traveler, In Search of Dinosaurs and Ancient Mammals from Montana to Mongolia, *365 pp., Farrar, Strauss, and Giroux, $26.00.*

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

Depictions of time travel are often found in the realm of science fiction. As an example, consider H.G. Wells classic story of time travel in the "Time Machine" and other similar works. Michael Novacek's book is appropriately titled because in a sense time travel is possible in the field of geoscience. This book is partly autobiographical, travelogue and natural history, combining elements of all three into enjoyable reading material. It is also entertaining to non-geoscientists because it offers insight into the driving forces to be a geoscientist and to illuminate what motivates "rock-hounds."

Novacek is currently curator of vertebrate paleontology at the American Museum of Natural History (AMNH) in New York City. The book focuses on the events that led to his career as a vertebrate paleontologist and to his adventures in the field searching for dinosaurs, mammals and extinct animals. (Novacek is also the author of *Dinosaurs of the Flaming Cliffs* in 1996. This book was listed by the New York Times as a Notable Book of the Year.)

Novacek begins his paleontological fieldwork in the western United States and in Mexico. During fieldwork in Baja California, there is a meeting with a cowboy "with dirty sheepskin chaps" in an adobe tavern, armed with a holster that "opened around the sweat-polished ivory handle of a pistol" (quotes from the book). The crew was able to desert the bar quickly without incident as a result of crafty handling of the encounter.

Novacek describes seeing the Flaming Cliffs for the first time. It felt very natural to be at the foot of these spectacular outcrops where the Andrews expedition had uncovered the fabulous vertebrate fossils during the Central Asiatic Expeditions of the 1920s. These cliffs "were familiar; they felt like home" and, as readers, we can appreciate how it must have been to stand at the base of these famous, prodigiously productive fossil cliffs. ■

Proposed Rules for Professional Geoscientist Continuing Education Program

by ***Henry M. Wise, P.G.***

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

The Texas Board of Professional Geoscientists (TBPG) will require continuing education to maintain a Professional Geoscientist (PG) license.

The proposed rule will require 15 professional development hours (PDH) per year plus a minimum of one PDH per year in the area of professional ethics, roles and responsibilities of PGs, or review on-line of the Texas Geoscientist Practice Act and Board Rules.

If you have specific questions as to whether a particular course, article, software, etc., qualifies for PDH and how much, discuss it with the TBPG. ■

The announcement has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

vrroooom!! . . . . . .

HGS Annual Road Rally

Saturday April 23, 2005 at 9:00 a.m.

A team or individual is given a packet with clues directing travel by car to secret cultural, historical, and geological sites in and around Houston. The team that answers the most questions based on the sites/clues and does it in the least mileage wins a trophy.

Coffee and donuts and a souvenir tee-shirt are included. The course takes 3 to 4 hours to complete and ends in a social event where trophies are awarded (meal/drinks not included).

WHEN Saturday April 23, 2005 at 9:00 a.m.

HOW?? Fill out the registration form below and send in a check for $30.00 per participant made to HGS with the memo line noting "HGS Road Rally." Please mail to: HGS, 10575 Katy Freeway, Suite 290, Houston, Texas 77024. Please mail by April 9, 2004.

START FORMING TEAMS NOW

If you want information on how to volunteer please contact Diane Yeager 713-646-1138 or 281-486-1732.

Register at www.hgs.org or find a registration form on the HGS Website : /www.hgs.org/2005/April

. . . . . ***vrroooom!!***

GET READY FOR THE 5th ANNUAL GSH/HGS SALTWATER FISHING TOURNAMENT 2005

Saturday, June 25, 2005

Teakwood Marina, Village of Tiki Island • Galveston, Texas

The announcement has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

This year's Fishing Tournament will be held on Saturday, June 25, at the Teakwood Marina, Village of Tiki Island, Galveston, Texas. We are looking forward to a big event this summer and we encourage full family participation.

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

Registration fee includes: launch fee, GSH/HGS fishing cap, Fish Fry meal after weigh-in, refreshments, trophies and DOOR PRIZES.

The Geophysical Society of Houston and the Houston Geological Society are non-profit organizations serving the geophysical industry. 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 their respective organization newsletters following the tournament. This is a great way to entertain friends, family, business associates and clients. So spread the word!

Register at www.hgs.org or find a registration form on the HGS Website : /www.hgs.org/2005/April

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

Remembrances

Since the last report from the Remembrances Committee (02/17/05), our geological community has lost the following members:

Clyde David Martin passed away on November 9, 2004, at the age of 78. He served in the U.S. Army Air Corps during World War II and then completed his BS in Geological Engineering in 1950 from Texas A&M. During his long career Clyde worked for Sunray Oil Company, General Crude Oil Company, SOHIO, and BP. He was an Active Member of the HGS and AAPG. A donation will be made to Texas A&M Association of Former Students.

James E. McCormick passed away on February 2, 2005, at the age of 77. After serving in the U.S. Army Air Corps during World War II, Jim earned a B.A. in Geology from Boston University. He began his career in 1953 as a geologist with Sun Oil Company. He retired as the President and COO of Oryx Energy in 1992. Jim was an Emeritus Member of the HGS. A memorial donation will be made to the M.D. Anderson Cancer Center.

Stephen G. Starr passed away on February 14, 2005, at the age of 71. Stephen served in the U.S. Army for four years prior to pursuing his education at Wayne State University. He earned a B.A. in 1961 and a M.S. in 1964, both in Geology and Geophysics. As a geophysicist, Stephen traveled the globe, becoming an extremely well respected expert in his field. He was a member of the SEG and AAPG organizations and was always willing and ready to help others. In the eighties downturn he directed his energies to putting the younger men and women in his field back to work, encouraging them to go back to school, if necessary, to complete degrees and worked tirelessly finding them opportunities for success. In his professional and personal life many were touched and all were the better for it. Education was of utmost importance to Stephen. He was an Active Member of the HGS, GSH, AAPG, and SEG. A donation will be made to the George Bush Heart Center.

Lawrence Julian Vittrup passed away on February 19, 2005, at the age of 94. Larry attended Texas A&M College and finished at The University of Oklahoma in 1932 with a B.S. in Geology. He began a 21 year association with The Texas Company (Texaco), interrupted by four years of service in the U.S. Army during World War II. Larry spent the next 40 years as a successful Texas Gulf Coast geologist and oil operator. He was an Emeritus Member of the HGS and AAPG. A donation will be made to Westminster United Methodist Church in Houston.

RSS Feeds and Feed Readers

It is a lot of trouble to search the HGS or GSH Websites frequently to see what's new. And how do you know where to look so you won't miss something? Wouldn't it be nice if you could just look in the corner of your computer screen and see a list of what has been posted recently? Now you can! It's called Really Simple Syndication (RSS) or, variously, RDF Site Summary or Rich Site Summary. Whatever the name, it's a way to syndicate the changes made on any website. All you need is a Feed Reader, sometimes called an Aggregator, and subscriptions (feed links) to as many sites as you like. Virtually all subscriptions are free and, so far, they are free from ads and spam.

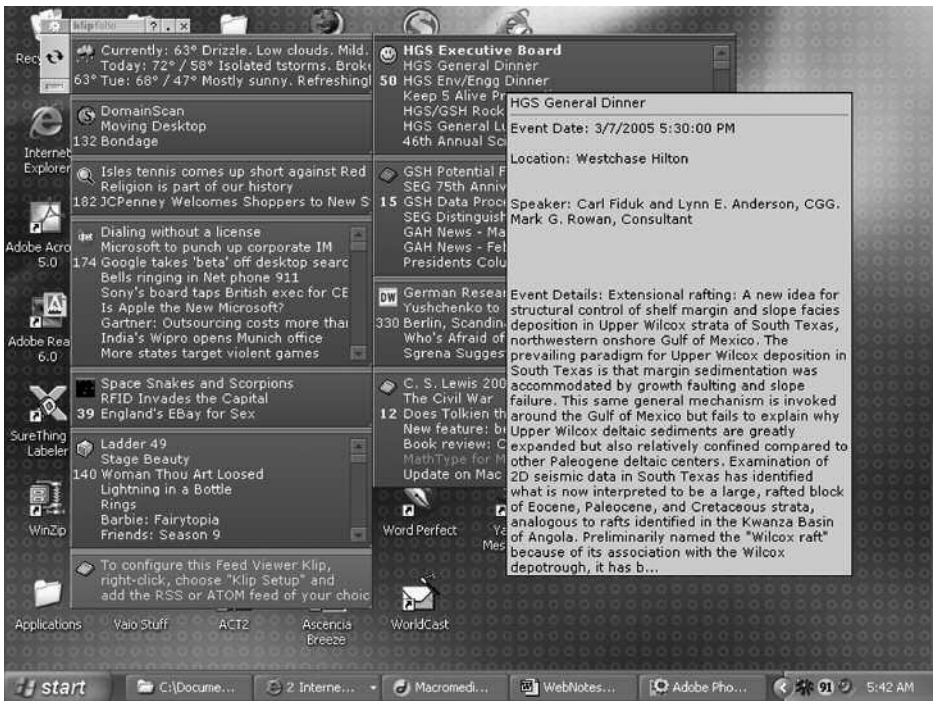
Here are some sample web references for RSS:
Definitions: (with links at http://hgs.org/2005/April/WebNotes/)

- Current list of readers
- Current list of popular feeds
- HGS feed. (XML file used by feed readers. Includes HGS.)
- GSH feed. (Includes HGS and SPE-GCS)
- SPE-GCS feed
- Wired article "A Scan of the Headline Scanners"
- And don't forget that Google is your friend.

There are many, many feed readers available, most are free and some not. There are so many to choose from that, rather than make a recommendation, I will tell you that I started with KlipFolio and am too lazy to change. The best way I can describe any RSS reader is to show you what mine looks like at the moment. (Hint: Click on the illustration to enlarge it, then you may have to resize it to be able to read the text clearly. Mouse-over the lower right corner to see the expansion symbol.)

In the illustration, there are a variety of local weather and general news feeds on the left. The HGS feed is in the upper right and GSH is just below it. The feed in the lower right is my son-in-law's blog.

In KlipFolio, the HGS and GSH entries are in three sequences (Events, Articles, and GeoJobBank), with the oldest posting first. The HGS site is showing 50 unread entries and the GSH site has 15. You can keep any entry visible and delete those that don't interest you. Other readers may present things in different order and some even show the topic (Event, etc.) in a separate column.



In the expanded illustration, I placed the mouse icon over the General Dinner entry in the HGS feed and it popped up to give me a basic overview of the talk. A similar expansion is possible for any posting on these feeds.

Read up on RSS. Look for the RSS feed logo on your favorite websites. You'll find RSS simple to install and use.

Dave Crane
HGS/GSH Webmaster
713/789-5916

Government Update

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

The article has been abridged. See the *Bulletin* Web version for the full text: /www.hgs.org/2005/April

Report on February 7, 2005 TBPG Meeting The Texas Board of Professional Geoscientists (TBPG) met on February 7, 2005. Many topics were discussed, including Continuing Education.

From the Texas Register Four bills have been introduced to the Texas Legislature that involve groundwater. The first is House Bill (HB) 653 and it's senate companion, SB 141. These bills relate to the regulation of subdivision of land under the jurisdiction of certain counties. HB 653 can be found at: http://www.capitol.state.tx.us/tlo/79R/billtext/HB00653I.HTM
SB 141can be found at: http://www.capitol.state.tx.us/tlo/79R/billtext/SB00141I.HTM
SB 343 relates to county authority to regulate the placement of water wells in unincorporated areas of the county, providing a penalty. SB 343 can be found at: http://www.capitol.state.tx.us/tlo/79R/billtext/SB00343I.HTM
SB 344 relates to the notice, hearing, rulemaking, and permitting procedures for groundwater conservation districts. SB 344 can be found at: http://www.capitol.state.tx.us/tlo/79R/billtext/SB00344I.HTM

TCEQ Updates Texas Water Quality Management Plan The TCEQ announces the availability of the draft January 2005 Update to the Water Quality Management Plan for the State of Texas. The Water Quality Management Plan (WQMP) is developed and promulgated in accordance with the requirements of the Federal Clean Water Act, §208. A copy of the draft January 2005 WQMP update may be found on the TCEQ's Web site located at http://www.tnrcc.state.tx.us/permitting/waterperm/wqmp/index.html. A copy of the draft may also be viewed at the TCEQ Library, Building A, 12100 Park 35 Circle, Austin, Texas.

US Congress Committee Members Announced Leadership of the House Energy and Commerce Committee, which oversees programs in the Department of Energy, EPA, and NIH, remains with Chairman Joe Barton (R-TX) and ranking minority member John Dingell (D-MI). Rep. Sherwood Boehlert (R-NY) retained his post as Chairman of the House Science Committee and Rep. Bart Gordon (D-TN) will again serve as the committee's ranking Democrat. Rep. Richard Pombo (R-CA) retained his post as Chairman of the House Resources Committee.

Sen. Ted Stevens (R-AK), the new chairman of the Committee on Commerce, Science and Transportation, formally recently approved a new subcommittee structure by creating a new climate change panel, an oceans subcommittee, and a disaster prevention and prediction body. The disasters panel comes partly in response to the Dec. 26 tsunami tragedy in Southeast Asia that left more than 225,000 people dead. Both Stevens and Inouye come from states hit by tsunamis and have had a longtime interest in tsunami and other disaster warning systems. In related news, Stephen Johnson took charge of U.S. EPA on January 26, 2005. And finally, the full Senate confirmed Samuel Bodman as energy secretary by a unanimous voice vote on January 31st.

Earthquake and Tsunami Brings Natural Hazards Mitigation to Forefront Following the massive earthquake and tsunami of December 26, 2004, which claimed over 225,000 lives from Indonesia to Somalia, the Bush administration has committed to expanding the nation's tsunami detection and warning capabilities. A new proposal called for $37 million to enhance USGS and NOAA operations and incorporate them into a Global Earth Observation System of Systems (GEOSS) involving the cooperation of 50 countries.

IUGS Statement Promotes Applied Knowledge of All Natural Hazards The International Union of Geological Sciences (IUGS) issued a resolution mid-January in response to heightened public awareness of natural hazards following the December 26th Earthquake and Tsunami.

Senate Moves Forward on "Clear Skies" Senator James Inhofe (R-OK), Chairman of the Senate Environment and Public Works (EPW) Committee and a cosponsor of Bush's plan known as the Clear Skies initiative, S. 131, introduced the bill on January 24, 2005.

Senators Press White House on Oil and Gas Research Funds Six members of the Senate Energy and Natural Resources Committee are urging the White House not to cut funds for Energy Department oil and gas research programs aimed at boosting domestic production.

DOE Explores Savings on Natural Gas Through Renewable Energy Programs In a report released in early January, the Department of Energy found that improving energy efficiency and increasing the use of renewable energy could significantly lower the cost of natural gas.

Education/Evolution Update In January 2005, members of state legislatures returned to their capitols and began introducing legislation that reflects their policy priorities. Not surprisingly given the increased public profile of evolution education, legislators in many states have introduced measures that would require disclaimers be placed in textbooks, require that intelligent design/creationism be taught along side evolution, or requiring that science teachers "teach the controversy."

HGA *and* GeoWives **News**

HGA

by Vicky Pickering, Third Vice President

The ladies of HGA are experiencing a busy time in Houston with the 2004-2005 calendar year drawing to a close in May. On Thursday, May 12, 2005 we will have our Business Luncheon and enjoy musical entertainment by "The Kingsmen," a barbershop chorus. We will meet at the Briar Club. Members please watch for your invitation in the mail and get your reservations in early. The party is being planned by Lois Matuzsak and her talented committee.

Remember, we have two bridge groups. "Cinco-Mas" plays bridge on the second Thursday of each month at the Junior League. Call Audrey Tompkins at 713-686-0005 for reservations and information. The Petroleum Club Ladies Bridge Group meets on the third Wednesday of each month. Call Daisy Wood at 713-977-7319 for reservations.

We would like to invite all wives of HGS members, widows of HGS members and female geologists who are members of HGS to join the Houston Geological Auxiliary for the coming year 2005–2006. Membership forms are found in the *Bulletin*.

GeoWives

GeoWives Spring Field Trip

The GeoWives Spring Field Trip is Thursday, April 14 to Nacogdoches Texas—the oldest town in Texas. The first European settlement was founded in 1779 by Antonio Gil Y'Barbo, a prominent Spanish trader. He laid out a town site and built a two-story stone home known now as the Old Stone Fort which we will visit. Of course, the Nacogdoche Indians had a village here many centuries earlier. Continuing our study of Sam Houston, we will visit the Adolphus Sterne home (built 1830). Houston was baptized as a Catholic on the porch of this house soon after he arrived in Texas in order to be eligible to own land under the Mexican government. After our lunch we will conclude our day with a guided tour of other historical sites.

We will leave from Memorial Drive Presbyterian Church at 8:00 a.m. and return about 5:30 p.m. Your check made to GeoWives for $18 and sent to Janet Steinmetz by April 9 is your reservation. This includes lunch, snacks, entrance fees, guide and transportation. All members of GeoWives, HGA and HGS are invited. Guests are welcome. Questions to Martha Lou Broussard or Linnie Edwards.

May Business Meeting

Our annual business meeting will be Thursday, May 19, at Cohen House, the faculty club at Rice University. Please keep this date available. More information to come.

As a member you are invited to join

GeoWives

2005–2006 dues are $7.50

make check payable to *GeoWives* and mail to:

Dene Grove
12715 Pebblebrook
Houston, Texas 77024

Please provide the following

Name: _____

Sreet Address: _____

_____

City/State/Zip: _____

Telephone: _____

email: _____

I will help plan a GeoWives activity ☐
I will serve on a committee ☐
Notification / Phone Committee ☐
Courtesy / Hostess ☐
My home is available for a meeting ☐

You are invited to become a member of

Houston Geological Auxiliary

2005–2006 dues are $20.00

make check payable to *Houston Geological Auxiliary* and mail to: Margaret Jones • 1407 Lakecliff Dr • Houston, Texas 77077

HGA YEARBOOK INFORMATION

Last Name	First Name	Name Tag
Spouse Name	Name Tag	HGS Members Company
Home Phone ( )	Business Phone ( )	Business Fax ( )
Street Address	City	Zip
Birthday, Month, Day ONLY	Email Address	Home Fax ( )

Professional **Directory**

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