

# HGS Bulletin

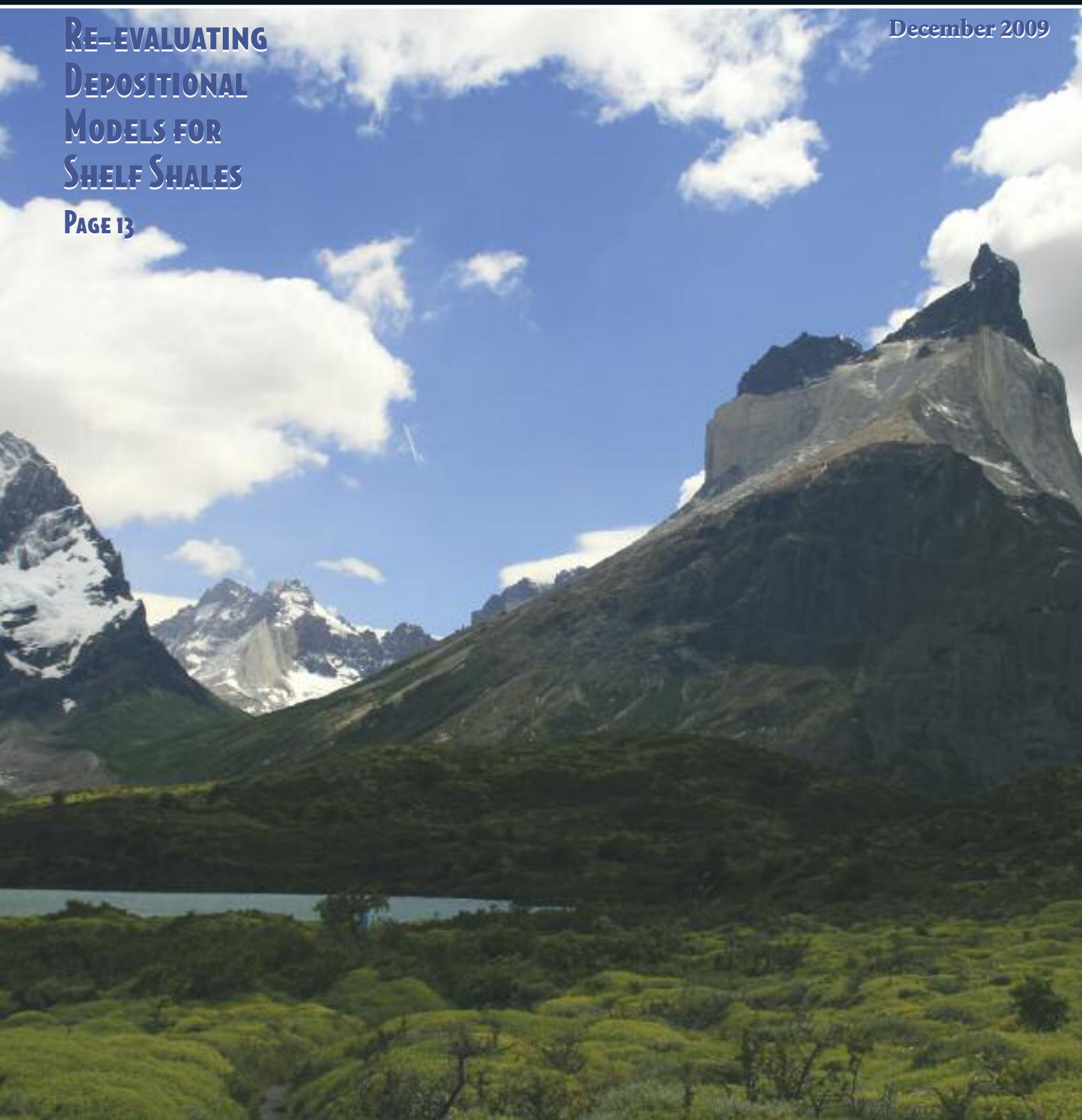
Volume 52 Number 4

Houston Geological Society

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December 2009



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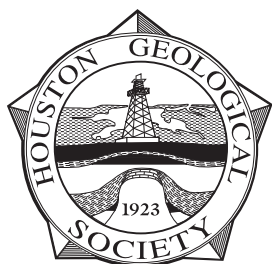
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# The Bulletin

## Houston Geological Society

Volume 52, Number 4

December 2009

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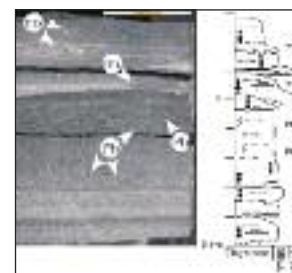
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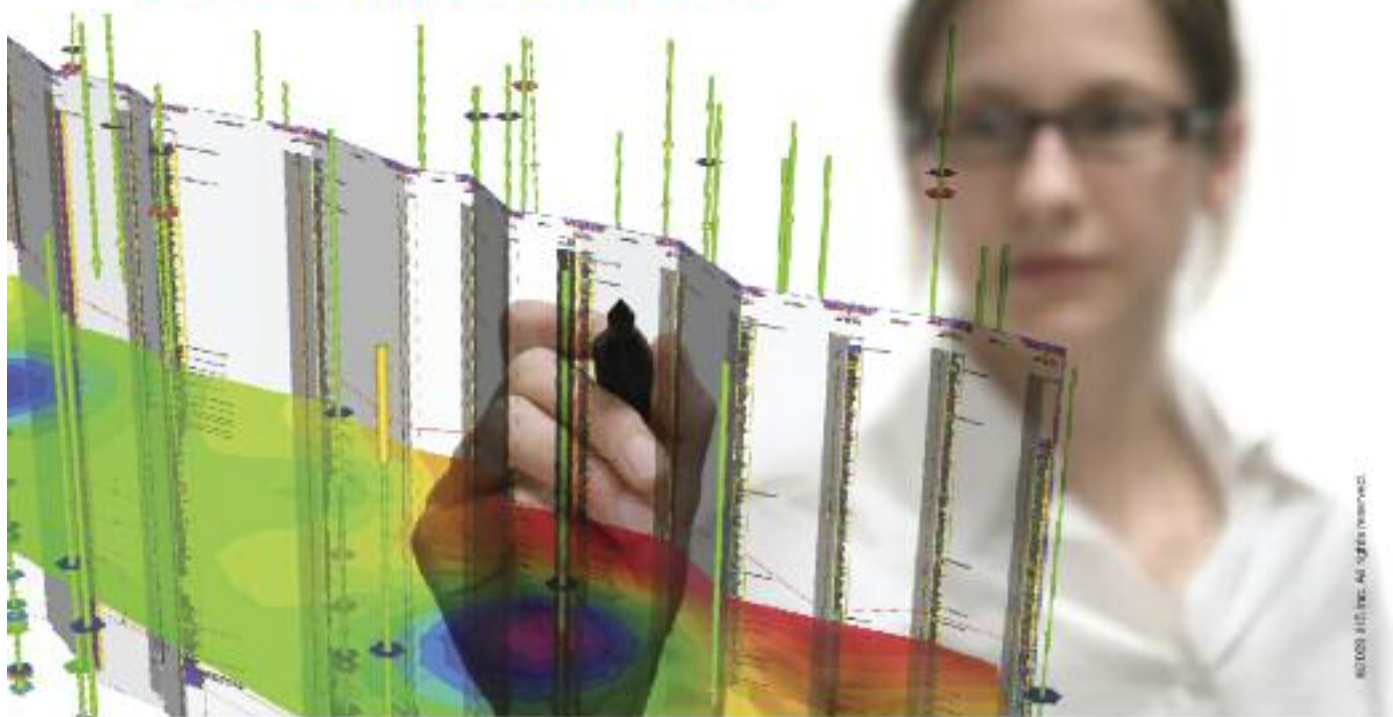


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**About the Cover:** The photo is from El Parque Nacional Torres del Paine in southern Chile. The Torres del Paine Intrusive Complex is a middle Miocene lacolith that consists of a basal mafic (dark) and overlying granitic (light) intrusive bodies. The dark basal unit is the Paine Mafic Complex (PMC) consisting of Cretaceous diorites and gabbros. Overlying the PMC are a series of granitic intrusive bodies. The dark units that cap the succession are Miocene sedimentary rocks of the Punta Barosa and Cerro Torre formations.

The granitic intrusives are thought to have been successively underplated along the top of the PMC in a series of pulses from the main Patagonian Batholith to the cores the Andes to the west. Photo courtesy of Arthur E. Berman.

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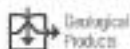
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**Gary Coburn**  
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## The HGS Wants YOU! Volunteer Today!

Wow, it is December already! Can you believe it? Perhaps I am just showing my age when I talk about how fast this year has gone. Between work, school functions, taking kids to soccer games and cheerleading, as well as all the fantastic HGS talks and meetings, this year has been a blur! Now it is December. It is the time when oil companies that still have money in their budgets are asking the geoscientists what data they would like to buy before the end of the year, drilling departments are busily coordinating the drilling wells so that they will all log at midnight on December 24th, and GOM geologists have visions of the upcoming "Lease Sale" dancing in their heads. To quote an old song "It's Christmas time in the city". This is a great time of the year, a magical time, when people feel good and are generous and charitable. They give donations to those iconic Santas ringing the bells in front of all the stores we frequent, give toys to the "Toys for Tots" program and coats to the homeless. They volunteer their time for various causes where they feel their help will make a difference.

The HGS is a perfect example of where your help can make an immediate and lasting difference (You knew this was coming, right?). The HGS is an organization run entirely by volunteers. Every talk, every short course, every meeting, every field trip, every golf tournament and skeet shoot, every school presentation, and every scholarship is organized and run entirely by volunteers. Every month the HGS puts on a minimum of six talks. Each of these talks is the result of a lot of behind-the-scenes work by some very dedicated volunteers. The addition of short courses, field trips, and other HGS functions creates an even greater demand for time contributions from our members. For example the Continuing Education Committee organized and conducted the following 2008-2009 events:

- Applied Geoscience-Mudstone Conference (Feb. 09) — 393 attended
- An Overview of Exploration Risk Analysis for Senior Management — 28 attended

- "HGS/PTTC Workshop: Sequence. Stratigraphy. in Onshore Mesozoic Salt Basins, Gulf Coast" — 71 attended
- "HGS CE Class: Petroleum Geology of Deep-Water Clastic (Turbidite) Depositional Systems" — 48 attended
- "HGS CE Class: Reservoir Engineering Tools for Geoscientists" — 69 attended.
- African Conference — 197 attended.

This year the HGS is fortunate to have Sue Pritchett volunteer to be the HGS Volunteer Coordinator. We are attempting to more efficiently match potential volunteers with volunteering opportunities. Some of the committees that need your help are: The Continuing Education Committee, Exhibits Committee, Office Management Committee, Web Site Committee, and the Photographer Committee. In addition, groups such as the HGS Northsiders, North American Exploration, International Explorationists, and Environmental and Engineering are always looking for good people to join in their efforts.

Sue will be glad to try to match your particular interests with committees that need volunteers. Please contact her at: pritchettsue@gmail.com .

There are a lot of very good reasons to volunteer. There is, of course, the sense of well-being that comes from volunteering your time to help a truly worthy organization. There is nothing like serving on a committee to bring together geologists from majors and independents alike. Geologists working together to put on a talk or event is always fun and is the best way to build real and lasting contacts. However, volunteering does more than just build a networking base and help make the HGS the premier local geological society in the world. Volunteering builds friendships that can last a lifetime.

I would like to take this opportunity to wish you and your family a very Merry Christmas or Happy Chanukah or Happy Holidays or at the very least, a great December! ■



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## Communication the Real Key to Success

During our careers we are asked to master a number of technical skills. These skills vary depending on the paths we take based on business need and personal interest. Some of us become true subject matter experts, with in-depth knowledge of a limited technical space. Others take on the role of generalist, with a broad, but not necessarily deep, understanding of any specific technical domain. Common to both groups is the need to effectively communicate. Communication is the interchange of thoughts, opinions, or information through oral or written means. Without the ability to effectively communicate our thoughts and work products, the value of our work is reduced.

Unfortunately, unlike many technical skills where there is an abundance of training options, there is only limited training in communication skills and all too often these skills are poorly mastered.

As seen in the popular media, we in the technical world have also focused on sound bites and bullet points. How often are we asked to develop an elevator speech or provide one or two slides for a PowerPoint presentation with the key summary bullet points? Yes, there is a need to be concise in our reporting and there are times when such communications are appropriate. All too often, however, these limited summary statements rather than being just a means to abstract or summarize project status or final conclusions, take on the role of a project's sole and final documentation. There are at least three questions that we should consider as a result of this shift toward this more limited communication style. Why have we moved in this direction? What has been the impact on the community and industry as a result of this shift? And, if we believe that there have been adverse consequences, what do we need to do in the future to minimize future problems?

There are a number of reasons that the quality and effectiveness of communication may have decreased in recent years. Many geologists and geophysicists tend to emphasize their interpretations and conclusions, as if they were facts without providing the necessary supporting data and information. There is even less information as to what prior work may support these interpretations and conclusions. References to these prior works

have nearly vanished. This trend may be a result of the ease of building a bulleted PowerPoint slide or the rise of technical teasers at the expense of technical details provided by the various internet browsers. Effective communication is a subject that we should have learned in school. In some classes, the emphasis was on ideas and concepts and not the actual quality of the communication. This lack of effective training has made this task more difficult. A few of us were fortunate and had one or two teachers or mentors willing to invest time to see that these skills were developed. The problem does not rest solely with skill sets there is also a question of cost.

*...Effective communication  
builds a professional's  
technical standing and  
credibility...*

Good presentations and well written technical reports take time to prepare and therefore may represent a significant part of a project. The end-user or manager may not fully understand the value of the more complete presentation or report. For some of these end-users, it is also a matter of time or their lack of it. However, when the results of a

study could impact a multi-million project one should be able to assume that taking an additional thirty minutes to hear a more complete assessment or read the technical details is reasonable.

With some understanding as to why communication skills have become blunted, let's turn to the impact. The most obvious impact is the elimination of the duplication of work that has been communicated and documented. Well prepared oral or written communication captures the data, their interpretation including the supporting references, and their significance. It becomes a starting point for future work – a foundation to build on. It ensures that educated and quality decisions can be made. Effective communication prevents problems such as those experienced by NASA where poor documentation resulted in a \$125 million mishap. In this incident poor communication between teams resulted in navigational problems and the crash of a Mars orbiter. There are other less tangible losses when effective communication is lacking. Communication transfers knowledge and is an important part of the learning process and the development of the next generation. The absence of effective communication and documentation could freeze us technically.

From the Editor continued on page 9



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Effective communication builds a professional's technical standing and credibility, becoming the foundation of a technical legacy. And, finally there is some pride in ownership and knowing that you have effectively communicated your thoughts and ideas to your peers and management. Legacies and pride of ownership will not develop without effective communication.

If there is agreement that effective communication has value, then what is required to get beyond the current state? Practice, practice, and more practice. Have someone read your work or sit through a rehearsal. Ask for constructive criticism. More importantly listen to the comments of others. Volunteer to provide constructive comments to someone else. Help management by providing sufficient information so that they understand the

justification for the investment in the appropriate level of communication and documentation. Note that the term investment was used; the added time and expense should be considered a value added proposition and not simply a cost. Management needs to remain sufficiently open-minded to understand why a project is not complete until correctly documented and communicated to others.

Let us make a New Year's resolution that in 2010 we will all begin to be more effective in our communication with our peers, partners, and management. ■

*Until next time...*

## An Opportunity for Learning

In October I spoke of the need for continuous learning. Many of us, however, find that either time or money may be an issue and that opportunities to attend formal training may be limited. While going through my most recent edition of *The Geoscientist* I was reminded of the Geological Society's Shell University Lecture Series. The Society has posted on their website these presentations which Fellows and non-Fellows of the Society may view on demand (<http://www.geolsoc.org.uk/gsl/events/past/shellunilectures09>). The 2009 lecture series dealt with the general theme of the origin and evolution of sedimentary basins. The titles and presenters are listed below.

- "Transtension in the brittle field: implications for accommodation space and fill deformation in sedimentary basins" presented

by John Dewey, UC Davis and University College Oxford

- "Basin modeling: past progress and future direction" presented by Tony Watts, University of Oxford
- "Deforming rivers: how active faulting controls rivers and sediment dispersal in rifts" presented by Sanjeev Gupta, Imperial College London
- "Passive margins" presented by Bruce Levell, Shell
- "Deep water fold belts" presented by Robin Hamilton, Shell
- "The search for Ithaca" presented by John Underhill, University of Edinburgh

*Please consider this an opportunity to continue your individual knowledge journey.*

B. J. Katz

## Letter to the President

Gary, with all due respect, while I admire the optimism and energy that you expressed in your October 2009 editorial, I don't agree with you when you say "All it really takes is someone who cares enough to give of their time to talk about geology" (re: elevating kids' interest in it). That statement is analogous to Roger Tory Peterson's assertion that awareness leads to concern: it makes partial sense but it's incomplete, and it was probably more true in the earlier stages of the

Information-Overload Age than it is today.

I believe that the problem with America's K-12 public science educational process is that there's TOO MUCH talk – and not enough participation. We have excised actual hands-on experience from the teaching of science via the move away from outdoor exploration and toward computers. Then, to nail shut the coffin of that dissociation, we developed an

overblown obsession with safety that we transmit to our kids (whose obesity statistics are soaring following the elimination of so many "unsafe" physical activities from their childhoods). So first we migrate them away from the experience of science, then we stress that it's dangerous, and then we wonder why they collectively demonstrate little interest and perform poorly with respect to it (e.g., just a few weeks ago, Aldine ISD won this year's

**Letter to the President** *continued on page 11*



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Broad Prize for nationally-recognized achievement in urban education, yet only around 70% of its students passed the latest science TAKS).

Talking is vital but it's only the first step and, if our efforts end with talking, kids will persist with only a weak experiential framework into which they can integrate incremental exposure to geology; any information they receive will join the endless barrage of daily "this is important" messages that feel compelling on the surface, but what do they really mean in the grand scheme of their lives? If HGS wants to make a meaningful contribution to local earth science education, it needs to clear additional pathways by which kids can reclaim their own initiative and get involved.

As HGS contemplates means by which that involvement could be increased, I recommend that interested members refer to the book "Last Child in the Woods" by Richard Louv. It might as well have been called "Last Child on the Outcrop", because the causalities and predicaments and trends that it summarizes underpin all facets of the direct outdoor experience that is a prerequisite to meaningful natural science involvement and education.

The final point I'd like to make is that the news media can be our friends in this effort. What you said in your column about junk science in the media has a great deal of truth to it, but the transmission of junk is a different type of

symptom of too much talk and not enough participation. The media is much like any other cross-section of society: the people who work in that industry have kids of their own, and most of them want to make a positive contribution to the world. Many do not derive satisfaction from the sensationalized crap that they routinely present as "news". But the media is just a reflection of the rest of us – which means that if we give them opportunities to present higher-quality content, they just might jump at the chance. Such was the case with my daughter's 5th grade science project last year, in which she found a Columbian mammoth tooth on High Island (not a stunning scientific advancement I realize, but an authentic example of one young child's active local involvement with geology, which is the point). You can link to the Channel 13 (KTRK) video segment near the top of this page:

[www.envirosteele.com/media.htm](http://www.envirosteele.com/media.htm)

You can also see from that webpage that we were excruciatingly careful to assemble factual resources for the media in a respectful and clear manner that they could parse given the educational backgrounds that they have (WE are the ones in possession of the science educations, not the TV reporters and producers – so if they fail to communicate accurately, the fault is more ours than theirs). In this small case, I think they produced a solid piece of reporting using the combination of the content that they were provided, plus their own creativity.

Thanks for considering my comments! And I do wish you (& all of us) the best with any educational initiatives that HGS develops.

Alison Steele Mandadi, P.G.  
Steele Environmental Services, LLC

## Gary Coburn's Reply

*I agree with you. Talking is the just the first step. I by no means feel it is the ONLY step. Still everything starts with the first step. What I was hoping to do was to get our members, especially those with children, to think about contributing their time. I really believe getting actual geologists into the class room makes quite an impression on our children. I agree with you that getting the kids out in the field is a great way to develop their curiosity and abilities. I participate in Williams Elementary School's "Hands on science". The kids love "getting their hands dirty" with practical science demonstrations. The main thing I was trying to impart to our members is to go the teachers and volunteer your expertise. Don't wait to be asked or for an organized effort to come along before you volunteer. Getting involved in our schools is too important to be left to chance.*

*That being said, I am hoping to get a truly organized effort going through the HGS. An effort of which I hope you will be an integral part. Thank you for your comments. I was glad to see my humble efforts fleshed out a bit! ■*



**Bring a non-member colleague with you to the next HGS meeting – share the networking and new ideas**

## *GSL-SEPM International Research Conference* **Salt Tectonics, Sediments and Prospectivity**



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**Janok P. Bhattacharya**

Robert E. Sheriff Professor of Sequence Stratigraphy,  
Geosciences Department, University of Houston  
Houston, Texas, U.S.A.

**James A. MacEachern**

Department of Earth Sciences  
Simon Fraser University, Burnaby, BC, Canada

## Re-evaluating Depositional Models for Shelf Shales

Despite the assumption that the bulk of marine “shelf” mud is deposited by gradual fallout from suspension in quiet water, modern muddy shelves and their associated rivers show that they are dominated by hyperpycnal fluid mud. This has not been widely applied to the interpretation of ancient sedimentary shale successions. We analyze several ancient Cretaceous prodelta shelf systems and their associated river deposits. Paleodischarge estimates of trunk rivers show that they fall within the predicted limits of rivers that are capable of generating hyperpycnal plumes. The associated prodeltaic mudstones match modern hyperpycnite facies models, and suggest a correspondingly hyperpycnal character. Physical sedimentary structures include diffusely stratified beds that show both normal and inverse grading (Fig. 1), indicating sustained flows that waxed and waned. They also display low intensities of bioturbation (Fig. 2), which reflect the high physical and chemical stresses of hyperpycnal environments. Hyperpycnal conditions are ameliorated by the fact that these rivers were relatively small, dirty systems that drained an active orogenic belt during humid temperate to subtropical “greenhouse” conditions. During sustained periods of flooding, such as during monsoons, the initial river flood may lower salinities within the inshore area, effectively “prepping” the area and allowing subsequent floods to become hyperpycnal much more easily. Although shelf slopes were too low to allow long-run-out hyperpycnal flows, the storm-dominated nature of the seaway likely allowed fluid mud to be transported for significant distances across and along the paleo-shelf. Prodelta hyperpycnites form leaner, gas-prone source rocks, prone to the generation of overpressure, versus more slowly deposited, organic-rich, anoxic laminites and condensed-section shales. ■

*...the bulk of marine 'shelf'  
mud...are dominated by  
hyperpycnal fluid mud...*

### Reference

Bhattacharya, J.P., and MacEachern, J.A., in press, Hyperpycnal Rivers and Prodelta Shelves in The Cretaceous Seaway of North America. *Journal of Sedimentary Research*, v. 79.

### Biographical Sketch

DR. JANOK P. BHATTACHARYA is the Robert E. Sheriff Professor of Sequence Stratigraphy at the University of Houston. His research interests include deltaic sedimentology and sequence stratigraphy, the local control of structure on stratigraphy, and the reservoir architecture of clastic depositional systems.



He received his B.Sc. in 1981 from Memorial University. Following his Bachelors degree, he worked at ESSO Resources Calgary, before completing his Ph.D. in 1989 from McMaster University. Following a Natural Sciences and Engineering Research Council post-doc, Janok worked for the Bureau of Economic Geology in Austin, ARCO Research, and the University of Texas at Dallas before joining the University of Houston in the fall of 2005.

Dr. Bhattacharya is an AAPG Grover Murray Distinguished Educator, AAPG Distinguished Lecturer, and AAPG SW Section Distinguished Educator. He was the 2008 GCSSEPM President, and has served on various AAPG Convention committees. He is currently co-chair of the AAPG Education Committee. He has been awarded an AAPG Certificate of Merit, the 2004 Dallas Geological Society Professional Service Award, the 2004 CSPG Best Oral Presentation award, the 2002 Frank Kottlowski Memorial Presentation Award, the 2002 Houston Geological Society Best Oral Paper Award, and the 2001 AAPG “AI” Cox Award for best poster at an AAPG SW section meeting.

He is an associate editor for the *Journal of Sedimentary Research* and has also served as associate editor for the *AAPG Bulletin*. He has authored or co-authored more than 100 abstracts and over 45 technical papers. He also co-edited SEPM Special Publication 83 titled “River Deltas: Concepts, Models and Examples”. He is an active member of AAPG, SEPM, GSA and IAS.

HGS General Dinner continued on page 15

## CALL FOR PAPERS

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- ✓ Organic 'Shales' of the Gulf Coast – Controls on Reservoir Quality and Producibility
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- ✓ Texas/Mexico Borderlands – Structures, Resources, and Lessons Learned
- ✓ Unconventional Resources – Exploration Decisions and Production Issues
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- ✓ Alternative Energy Solutions – The Role of Geoscience
- ✓ Water for a Growing Region – Geology, Water Quality and Resource Management
- ✓ Geologic Training and Education – Preparing for the Crew Change

### **HOW TO SUBMIT:**

Abstracts (not more than 250 words) should be submitted for review online or via email to the technical program chair. Papers should have application to Gulf Coast and Gulf of Mexico geology. Include your full mailing address, telephone and FAX numbers, email address, and whether you are submitting for **oral** or **poster** or **either** (preferred).

Submit abstracts by **February 1, 2010** as instructed on the website [www.gcags2010.com](http://www.gcags2010.com)

Notification of acceptance by March 1, 2010. All presenters, both oral or poster, must submit either a paper (10-12 pages) or an extended abstract with key figures for review by **April 16, 2010** for inclusion in the *Transactions*. Full instructions for authors will be posted at [www.gcags2010.com](http://www.gcags2010.com).



### **ABSTRACT DEADLINE: FEBRUARY 1, 2010!**

Questions or ideas for the technical program should be directed to:

Dr. Mary Feeley

Technical Program Chair

281-654-3588

[missy.feeley@exxonmobil.com](mailto:missy.feeley@exxonmobil.com)

Dr. Alan Dutton

GCSSEPM Co-Chair

210-458-5746

[alan.dutton@utsa.edu](mailto:alan.dutton@utsa.edu)



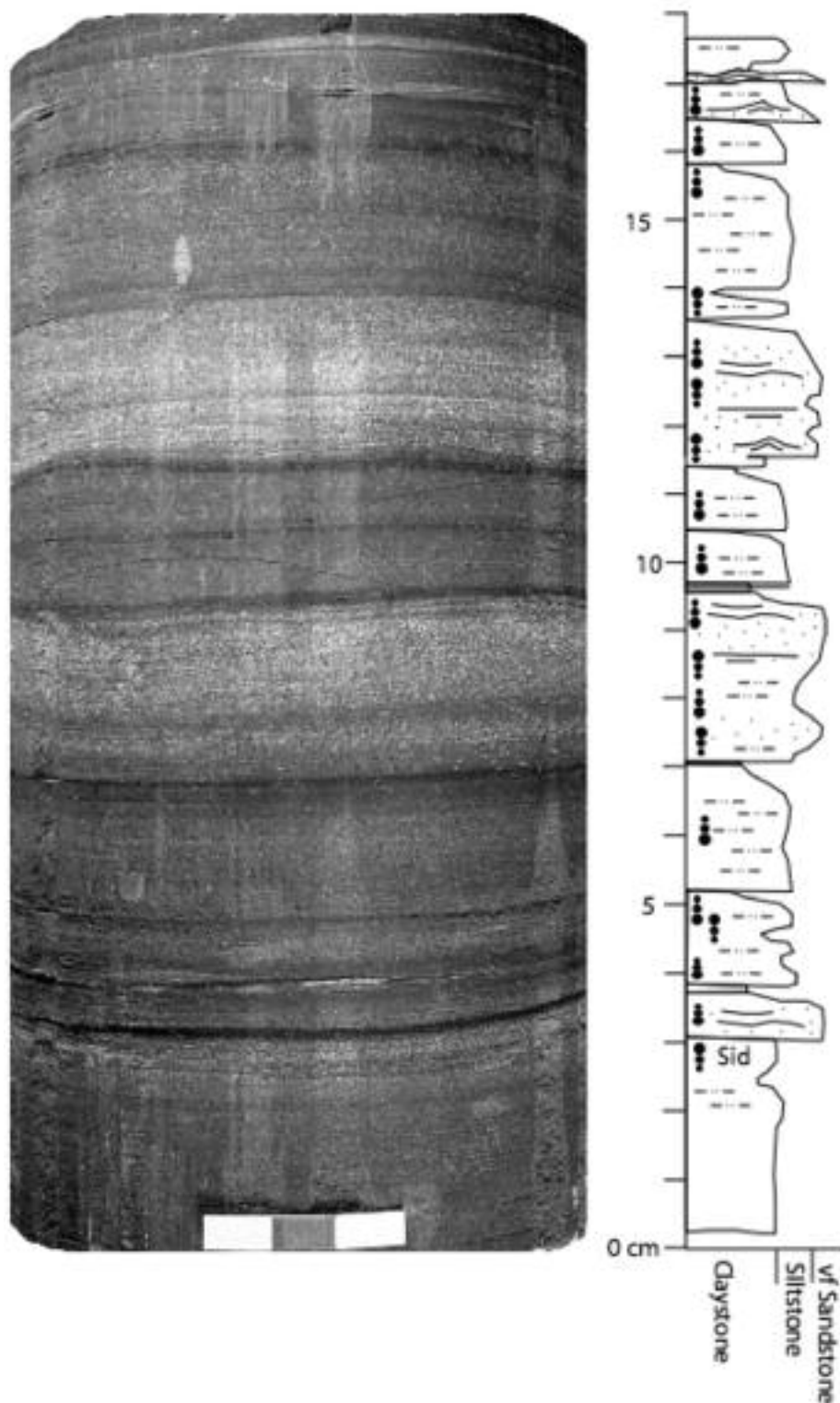


Figure 1. Core photograph of diffusely bedded prodelta mudstones and siltstones, with no bioturbation. Note the inverse grading at 7, 8, and 12 cm. Scale is 3 cm. Core sample is from the Cretaceous Dunvegan Formation, Canada (from Bhattacharya and MacEachern, in press).



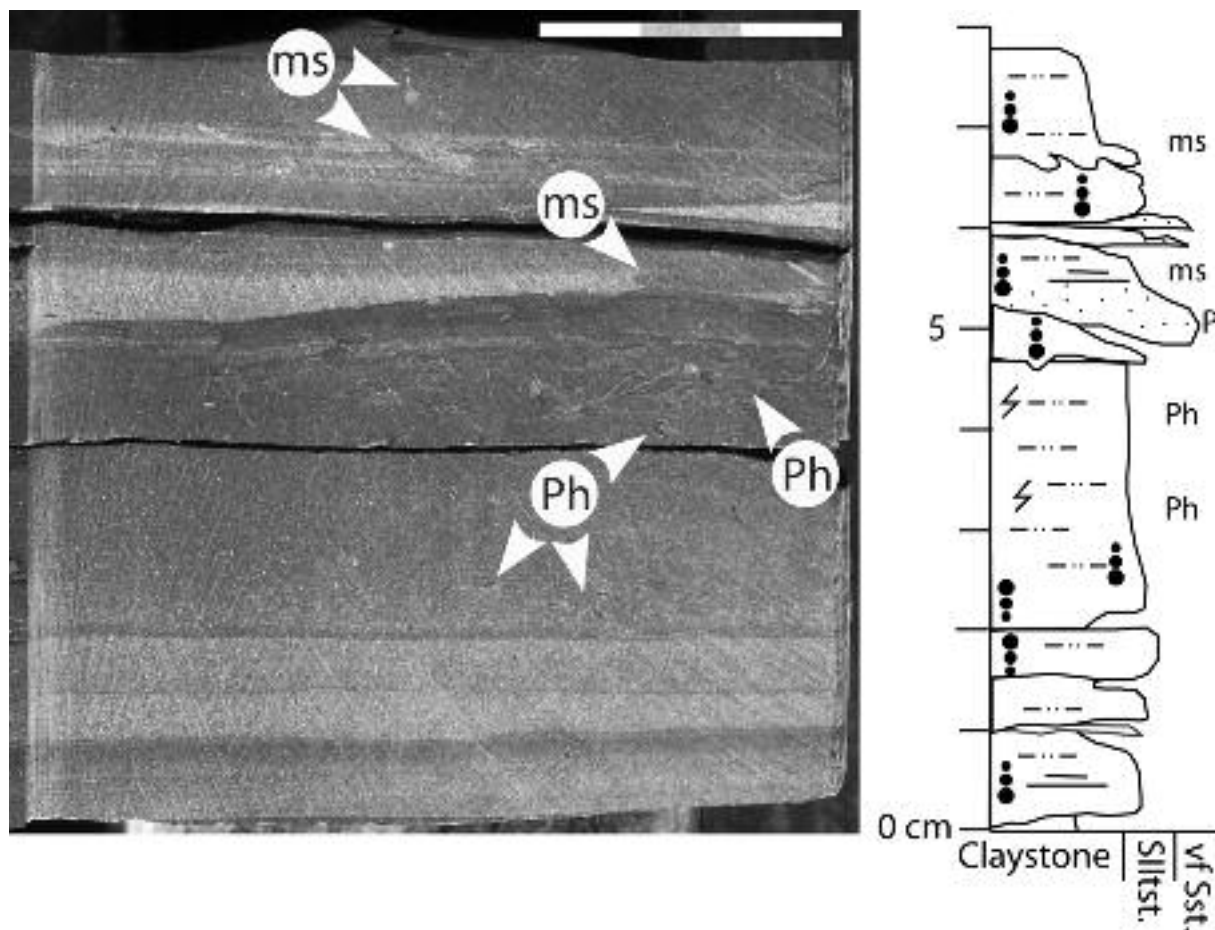


Figure 2. Core photo of prodelta facies of the Cretaceous Dunvegan Formation, showing both inverse and normally graded siltstones. Wispy mud-streaks at 4.5cm are identified as Phycosiphon. Note that these lie in the clayey tops of thick graded siltstone beds, and may reflect colonization of the bed top after deposition. Lateral disruption of sandy and silty laminae may represent “mantle and swirl” (ms) structures, recording the activity of sediment-swimming organisms in the rather soupy substrate. Small flame structures in upper units also indicate soft-sediment deformation. Unlabeled Planolites (P) occurs on the right side of the photo, and marked on the litholog.

#### Reference

Bhattacharya, J.P., and MacEachern, J.A., 2009, Hyperpycnal Rivers and Prodeltaic Shelves in The Cretaceous Seaway Of North America. *Journal of Sedimentary Research*, v. 79.



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## Salt Movement in the South-Central Walker Ridge Area, Gulf of Mexico

Over the past 15 years a number of models for the thin-skinned evolution of the Gulf of Mexico (GoM) have been put forward to describe the relationship of the present-day Sigsbee allochthon to its precursor Louann autochthonous salt basins. Models involve intermediate stage allochthonous sheet development (notably in the late Paleogene and early Neogene) and early salt nappe or para-autochthonous sheet extrusion (through the Mesozoic and into the early Paleogene). Models have focused on the western and eastern GoM where seismically identified foldbelts mark the compressional distal end of the thin-skinned deformation systems. Here the compressional foldbelts are linked through translational domains to time equivalent updip extensional domains, providing a “balanced” structural picture of thin-skinned salt movements across the basin margin. Less attention has been paid to the central GoM (central Keathley Canyon to central Walker Ridge areas), where although shelfal and shelf edge extension is recognizable, the equivalent distal portion of the thin-skinned deformation system is characterized by a more enigmatic and not clearly compressive, tectonic style.

In the central Gulf structural style varies with salt-cored folds (which form as a result of both compression and salt withdrawal) found in conjunction with diapirs and salt walls (which are either vertical or verge towards the basin) and other salt styles such as counter-regional fault systems and bowl weld systems. Salt-cored folds tend to be periclinal, have low fold axes length ratios and are less well organized than those seen in the Alaminos Canyon and Atwater Valley areas. Salt wall trend is variable with early counter-regional style geometries forming along walls orientated WNW-ESE and salt stock canopy development more often associated with diapir-salt wall systems that trend nearer N-S. Based on the observed structural styles, it is difficult to characterize this part of the deepwater margin as solely compressional.

Salt movements in the south-central Walker Ridge area are described using Mesozoic to early Neogene isochore and depth structure maps. The observations made are used to suggest why salt-related structural geometries in this area vary from the well-defined compressional zones seen further to the west and east. ■

### Biographical Sketch

Born in Northern Ireland Rob was educated at Regent House Grammar School before studying geology at Queens University Belfast 1982-86 where he received a B.Sc. Hons degree. In 1986 he moved to the University of Natal, Durban, South Africa where he studied for a M.Sc. after which he joined Consolidated Goldfields and worked in minerals exploration for the next 6 years. In 1993 he returned to academia and in 1996 graduated from Southampton Oceanography Centre with a Ph.D. in Structural Geology. In 1996 he joined Alastair Beach Associates in Glasgow and worked as a structural geologist before joining Phillips Petroleum Company Norway in 1998 where he worked as both an explorationist and structural geologists serving the Norwegian and UK offices. In 2002 Rob joined Statoil AS in Stavanger as a structural specialist in their Technology division. He joined their Global Exploration group in 2005 and moved to Houston where he worked as part of a Joint Venture team at ExxonMobil. Earlier this year Rob moved back to the Global Exploration Technology division where he has taken up the position as Lead Advisor Salt Tectonics. He is currently based in Houston.



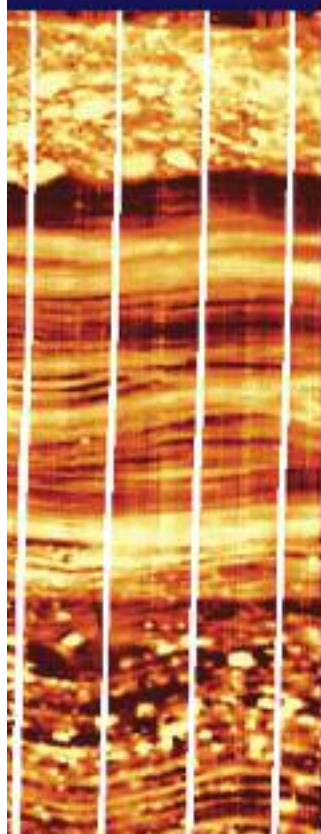
*...salt-related structural geometries in this area vary from the well-defined compressional zones seen further to the west and east.*

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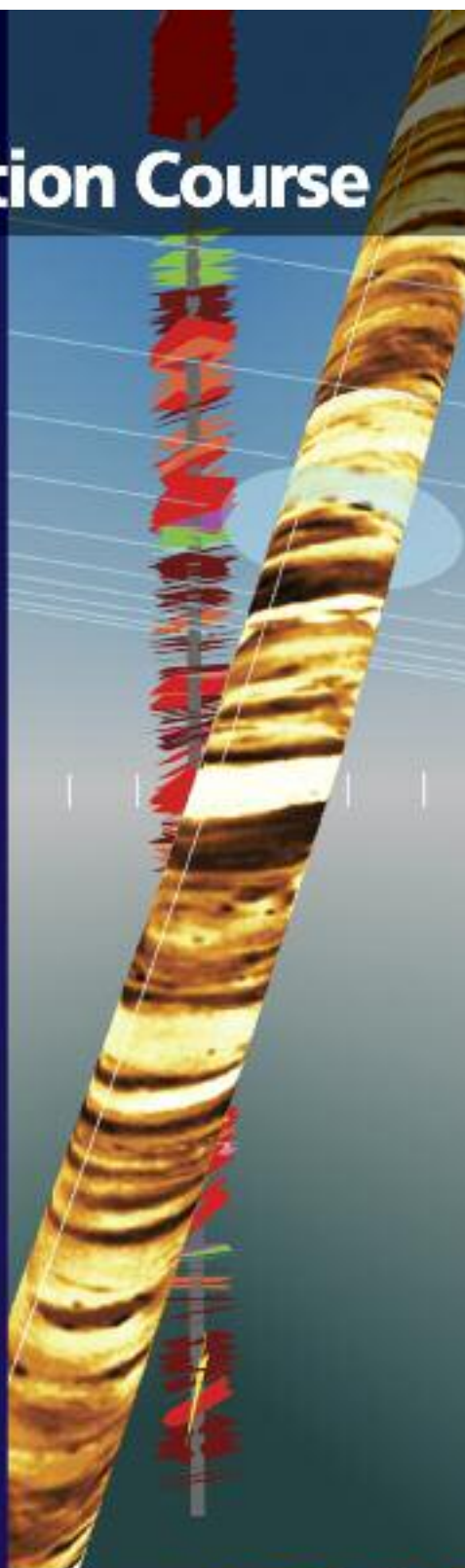
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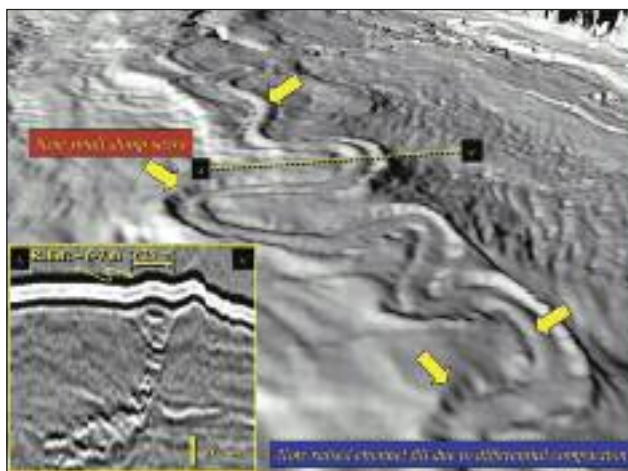
# SIPES Luncheon Meeting

## Using 3D Seismic Data to Predict Lithology in the Subsurface: Applications of Seismic Geomorphology and Seismic Stratigraphy from Deep Water to Shelf

Henry W. Posamentier, Chevron Energy Technology Company

3D seismic data can play a vital role in hydrocarbon exploration and development, especially with regard to mitigating risk associated with presence of reservoir, source, and seal facies. Such data can afford direct imaging of depositional elements, which can then be analyzed by applying seismic stratigraphic and seismic geomorphologic principles to yield predictions of lithologic distribution, insights to compartmentalization, and identification of stratigraphic trapping possibilities. Benefits can be direct, whereby depositional elements at exploration depths can be identified and interpreted, or they can be indirect, whereby shallow-buried depositional systems can be clearly imaged and provide analogs to deeper exploration or development targets.

Examples of imaged depositional elements from both shallow- and deeply-buried sections are presented. Deep-water deposits, in particular, have benefited greatly from analyses of 3D seismic data. The understanding of the stratigraphic and geomorphological evolution of these deposits has increased significantly since the advent of 3D seismic-based analyses. In high-cost deep-water exploration settings, insights derived from such analyses are critical to reduce risk with regard to reservoir presence and reservoir compartmentalization to ensure economic success. Depositional elements in settings such as shoreface, shelf, estuarine, and fluvial, as well as in carbonate environments, also benefit greatly from 3D seismic analyses. Numerous examples will be shown. ■



Deep-water Pleistocene turbidite channel in the Gulf of Mexico. A perspective and cross section view are shown. The positive relief that characterizes the channel suggests that the channel is sand-filled. Note the presence of levees at the outer bends of the channel. This channel is approximately 150m wide.

### Biographical Sketch



**HENRY W. POSAMENTIER** is a Senior Geological Consultant with Chevron Energy Technology Company. He serves as a worldwide consultant to exploration teams focusing on lithofacies prediction risk issues. Prior to joining Chevron in 2007, he was with Anadarko Petroleum Corporation where he served as Chief Geologist. Earlier he was with the Atlantic Richfield Co. (1991-2000), Exxon Production Research Co. and Esso Resources Canada, Ltd. (1979-1991), and at Rider University, Assistant Professor of Geology (1974-1979).

Dr. Posamentier's research interests have been in the fields of sequence stratigraphy and depositional systems analysis, where he has published widely. Most recently, he has employed an interdisciplinary approach to the predication of lithofacies distribution through time and space by integrating stratigraphy, geomorphology, and depositional systems analysis, using 3D seismic visualization integrated with borehole data. In 1971-1972, Dr. Posamentier was a Fulbright Fellow to Austria. He has served as an AAPG Distinguished Lecturer to the United States (1991-1992), an AAPG Distinguished Lecturer to the former Soviet Union (1996-1997), an

AAPG Distinguished Lecturer to the Middle East (1998-1999), and an AAPG Distinguished Lecturer to Europe (2005-2006). Most recently (2008) he was awarded the Pettijohn Medal for excellence in sedimentology from the Society for Sedimentary geology (SEPM). ■

### Thursday, December 17, 2009

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

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

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



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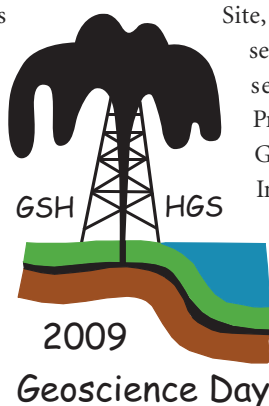
# Geoscience Day 2009 Provides an Industry Overview for New Employees

by Haynie Stringer

The Geophysical Society of Houston and the Houston Geological Society hosted the third annual Geoscience Day on Thursday, September 24, 2009 at the Bureau of Economic Geology in Houston. The purpose of the event was to give a high-level, broad overview of geological and geophysical methods to individuals who are new to the industry. This year's theme was *The Life of an Oilfield*. Activities consisted of presentations given by experienced employees of the industry, field acquisition demonstrations, modern and vintage equipment exhibits, and docent led interpretative displays. Geological and geophysical topics were addressed, as were various commercial and political issues faced by the industry. Approximately 95 presenters and attendees participated.

After viewing the various aspects of the life of an oilfield, participants left with a broader knowledge of what difficulties and problems their peers in other areas must routinely solve for others to see their "finished" product. They began to understand what those in other areas may expect and rely on from the products of the participant's work, and gained a perspective that will help them ask or answer questions when discussing a project with experts outside their immediate expertise.

The day's activities were divided into four main track presentations and four periods of breakout sessions. The main track followed



the life of an oilfield through presentations on The Politics of Oil, From Geologic Idea to Lease Acquisition, From Prospect to Drill Site, and After the Initial Discovery Well. The breakout sessions amplified detailed aspects of the main track sessions and included presentations on Seismic Processing, Monitoring and Fracturing, 3D Visualization, Google Earth in Seismic Surveys, and Core Interpretation. A field seismic acquisition demonstration, complete with an operating vibrator, deployed geophone strings, and recording and QC equipment, was a particular highlight. A "Tools of the Trade" section exhibited vintage and modern day equipment and technology in booths manned by docents explaining such technology as well logging products and interpretation, marine seismic cable birds and steering devices, analog and digital recording media evolution, a geophone response demonstration, and seismic crew operations.

## Sponsoring Organizations



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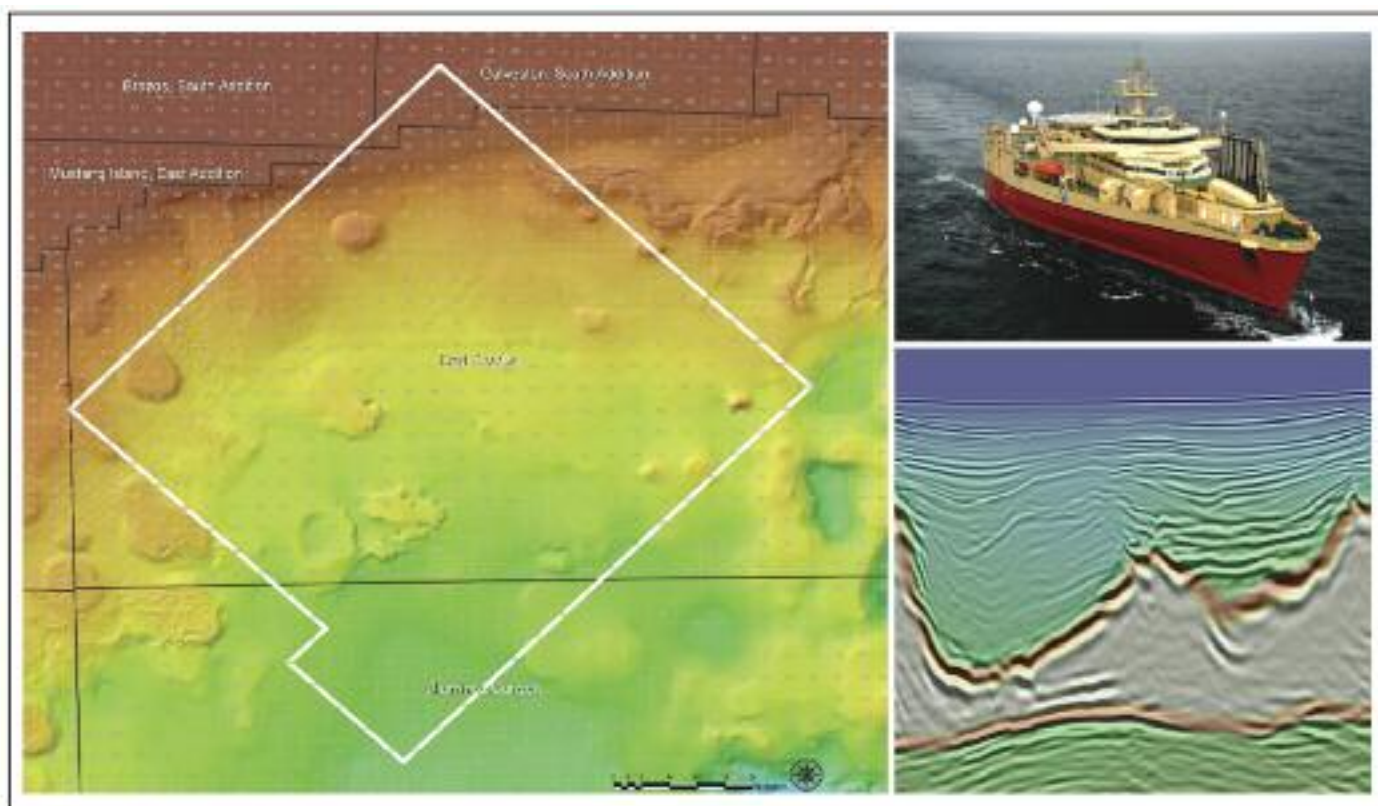


Comments left on the attendee evaluation forms stated: "Fun and good way to learn." "It was a great overview of the industry, and there was a lot of hands-on exposure (Cores, Vibroseis, etc.)", "Good source of expertise and industry knowledge and basic concepts for new employees", and most importantly, "Had a good time. Great for meeting new people and networking."

Geoscience Day 2010 is scheduled for October 7, 2010 at the same BEG venue. Please contact Haynie Stringer through the HGS/GSH office for additional information or inquiries about participation in next year's event. ■

Geoscience Day 2009 continued on page 25





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# What Every Geologist Wants for Christmas

Contributed by Terry Katz – Editor's Better Half

Every year, right around this time, as the days are getting shorter and the stores are filling their shelves with the traditional colorful displays of ornaments and ribbons, I face my annual dilemma — what to get my geologist husband for his holiday gift!

After 32 years of seasonal holidays, birthdays, anniversaries, and 28 Father's days is there any originality left? I'm certain that I am in good company with my predicament. Is this topic of significant importance for publication in the HGS *Bulletin*? Show this article to your spouse, ask their impression, and then decide.

**In the meantime, I will present my version of the 12 days of Christmas.**

*On the first day of my geologist's Christmas his true love found for him..*

A jigsaw puzzle of Yosemite

*On the second day of my geologist's Christmas, his true love found for him..*

A t-shirt boasting "Geologists Rock!"

*On the third day- you've got the idea...*

A subscription to *Rock and Gem Magazine*

For the next few days, I've found.....

A rock head hammer with a matching leather case.

A clock with a face made of semi precious stones

A framed picture of an oil rig or a metal sculpture of an oil rig.

There are thermal bottles which retain heat for 24 hours and even a water bottle which becomes a solar lantern!

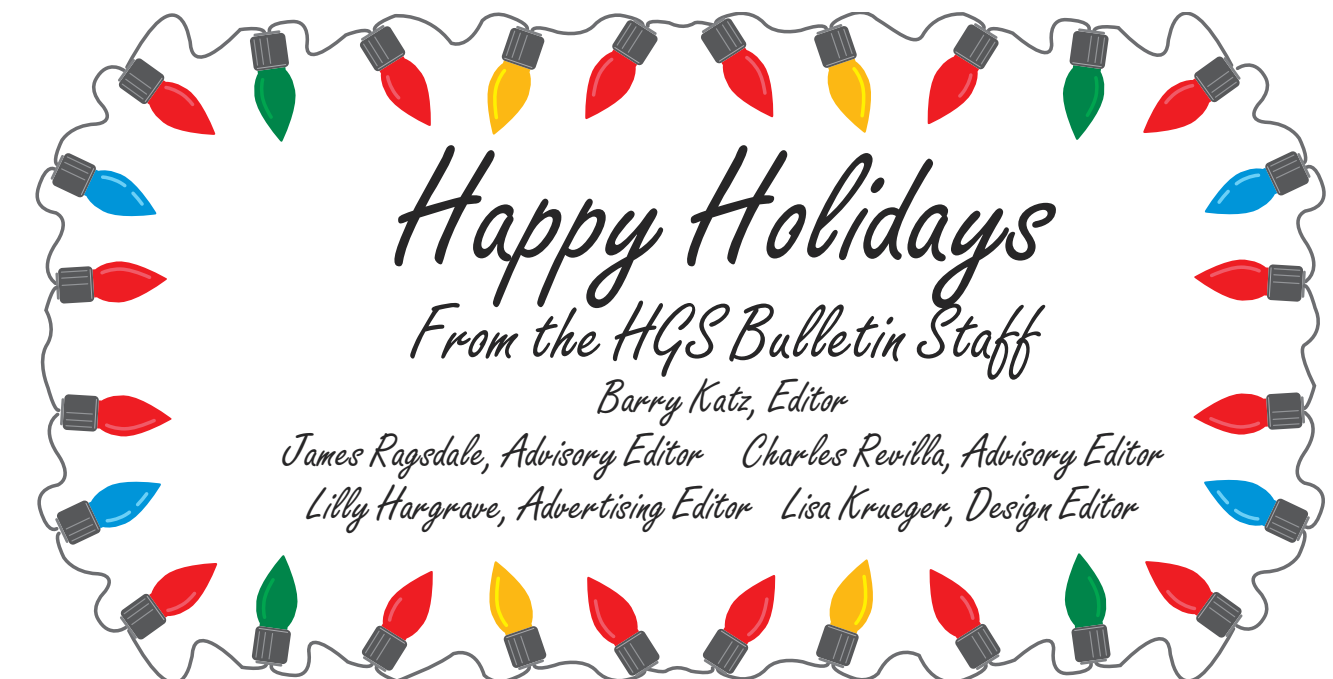
In my search I found a beautiful brass compass, and a black box clock.

There are geodes to meet anyone's budget: bookends, desk ornaments, decorations, too.

I saved the best for last: cuff links and tie tacks with stone faces or for the lady of the house, gorgeous necklaces and earrings with stones that sparkle.

I must tell you that I never left my house to perform this extensive search. Follow my example, and as the saying goes... 'let your fingers do the typing on the internet!'

*Happy shopping and happy holidays to all!*







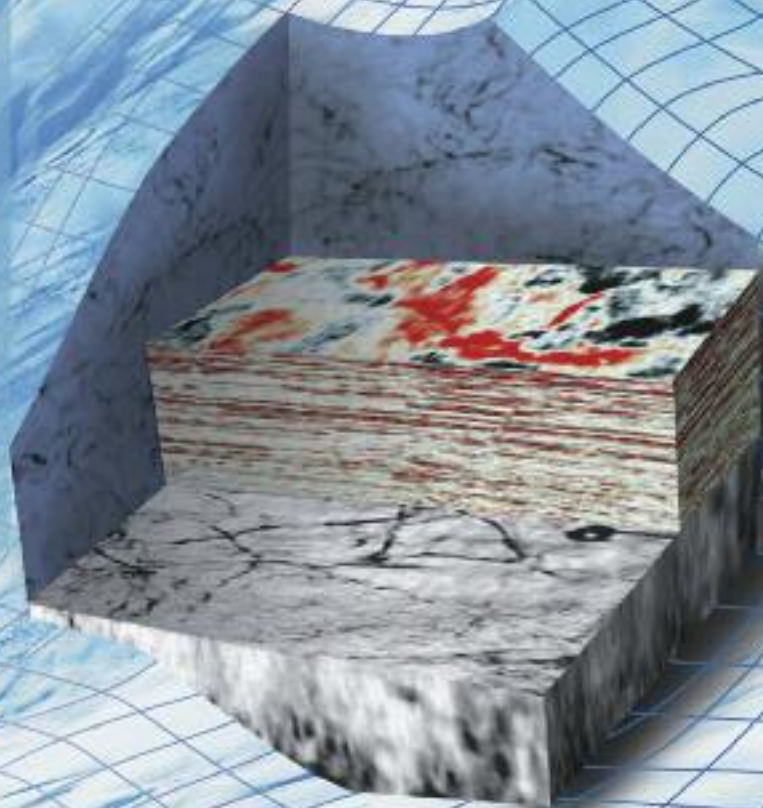
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# December 2009

Sunday

Monday


Tuesday

Wednesday



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<p>6 <b>Bob F. Perkins Research Conference</b> <i>Unconventional Energy Resources: Making the Unconventional Conventional, Houston Marriott Westchase Hotel</i></p>	<p>7 <b>HGS General Luncheon Meeting</b> <b>Rescheduled from Nov. 18</b> <i>"The Business Case for Gender Diversity in the Geoscience Workforce"</i> Cindy Yeilding and Denise Butler, Petroleum Club</p>	<p>8</p>	<p>9</p>
<p>13</p>	<p>14 <b>HGS General Dinner Meeting</b> <i>"Re-evaluating Depositional Models for Shelf Shales"</i> Janok P. Bhattacharya and James A. MacEachern, Westchase Hilton Page 13</p>	<p>15 <b>HGS Northsiders Luncheon Meeting</b> <i>"Salt Movement in the South-Central Walker Ridge Area, Gulf of Mexico"</i> Robert Hunsdale, Crowne Plaza Hotel Page 19 <b>Deadline for Submission to the February Bulletin</b></p>	<p>16</p>
<p>20</p>	<p>21 <b>HGS Holiday Party Hosted by the International Explorationists</b> <i>Sullivan's Steakhouse</i> Page 47</p>	<p>22  HGS office closed December 21-January 3 for Christmas and New Year's</p>	<p>23</p>
<p>27</p>	<p>28</p>	<p>29</p>	<p>30</p>

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# GEOEVENTS

Thursday

Friday

Saturday

3	4	5
10	11	12
<b>17 SIPES Luncheon Meeting</b> <i>"Using 3D Seismic Data to Predict Lithology in the Subsurface: Applications of Seismic Geomorphology and Seismic Stratigraphy from Deep Water to Shelf"</i> Henry W. Posamentier, Petroleum Club Page 21	18	19
24	25	26
	Merry Christmas	
31	<b>Reservations:</b> The HGS prefers that you make your reservations on-line through the HGS website at <a href="http://www.hgs.org">www.hgs.org</a> . If you have no Internet access, you can e-mail <a href="mailto:reservations@hgs.org">reservations@hgs.org</a> , or call the office at 713-463-9476. <b>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.</b> 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 <a href="mailto:Webmaster@hgs.org">Webmaster@hgs.org</a> . Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. <b>No shows will be billed.</b>	



## Upcoming GeoEvents

- March 2-4, 2010**  
APPEX 2010 *London, England*
- April 11-14, 2010**  
AAPG Annual Convention & Exhibition, *New Orleans, Louisiana*
- April 22-23, 2010**  
Modeling Sedimentary Basins and Their Petroleum Systems  
Geological Society *London, England*
- May 3-6, 2010**  
Offshore Technology Conference  
*Houston, TX*
- May 16-18, 2010**  
AAPG Southwestern Section Meeting *Dallas, TX*
- May 22, 2010**  
HGS Guest Night  
*Houston Museum of Natural Science*
- June 8-10, 2010**  
Applications of Reservoir Fluid Geochemistry, AAPG Hedberg Research Conference  
*Vail, CO*
- June 13-16, 2010**  
AAPG Rocky Mountain Section Meeting *Durango, CO*
- July 4-8, 2010**  
Australian Earth Sciences Convention *Canberra, Australia*
- September 8-9, 2010**  
9th HGS/PESGB Conference  
*Africa: A Multi-faceted Promise Houston, TX*
- September 12-15, 2010**  
AAPG International Conference & Exhibition *Calgary, Canada*
- April 10-13, 2011**  
AAPG Annual Convention & Exhibition *Houston, Texas*



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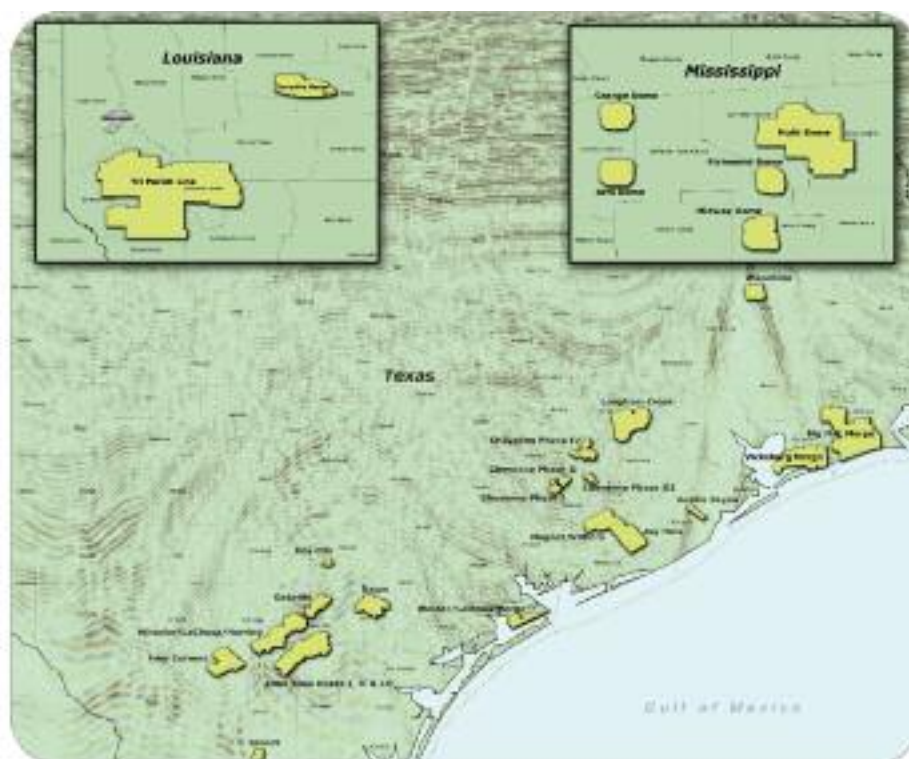
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# 9th HGS/PESGB Conference **PES** **GB** Africa: A Multi-faceted Promise

Houston, 2010  
**September 8-9, 2010**

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**Note change of dates from previous announcement!**

**Plan to attend this event during the week before the AAPG Int'l Convention in Calgary.**



This annual conference has become established as the primary technical E & P conference on Africa. Scheduled for 8-9 September 2010 in Houston, a two-day program of talks is planned on the 8th and 9th along with technical posters as well as exhibits from sponsoring companies. Opening reception will be on Tuesday evening September 7th.

The conference series, organized by members of the International Group of Houston Geological Society (HGS) and Petroleum Exploration Society of Great Britain (PESGB) covers all aspects of African E&P, with particular emphasis on new ideas for plays and prospects, the geology of the continent and its conjugate margins, and application of emerging technologies.

**Technical Contributions and Sponsorships are welcomed now.**

Please submit topics or abstracts (~200 words) as soon as possible for consideration of the Technical Committee by email to [Africa2010@att.net](mailto:Africa2010@att.net). The program will be finalized by end April.

For sponsorship opportunities or exhibit space or any other inquiries, please contact the committee at the same email address above.

Pre-registration will be available from April, further details will be appear in the HGS Bulletin, PESGB newsletter and websites.

**Conference Committee for 2010** includes Al Danforth, Ian Poyntz, Martin Cassidy, Dave Schwartz, Justin Vanden Brink, and Tarek Ghazi (Houston), Ray Bate and Duncan Macgregor (London).





# Government Update

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

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

## California Board of Geologists and Geophysicists Abolished

The State of California has abolished the California Board of Geologists and Geophysicists (BGG), effective October 23, 2009. The Board for Professional Engineers and Land Surveyors (BPELS) will then assume "...all the duties, powers, purposes, responsibilities, and jurisdiction previously vested in the Board..." along with "...two personnel years...for performance of the board's responsibilities..." under the Geologist and Geophysicist Act.

This action was taken by legislators under pressure from the governor to reach a budget compromise that includes a reorganization of the state government. As part of the reorganization plan, agencies were up for merging or elimination. After a couple of failed attempts, it was brought back up under the budget crisis, at which time the governor threatened to veto any budget that did not include a reorganization plan.

Since consideration of a change was required, it had been the BGG's position that they needed to stay within the Department of Consumer Affairs, rather than being moved into the Department of Conservation. In June, there had been discussion of a merger between the BGG and the State Mining and Geology Board (which was in the Department of Conservation), and were told that a merger with the Board of Professional Engineers and Land Surveyors (BPELS) was not on the table.

However, on July 23, 2009, some wording was slipped into legislation which was not read in public, and a legislative vote eliminated the BGG, moving the geologists under the BPELS. Given the apparent lack of due process, an injunction will be filed on the procedural issues.

This transfer, which had no impact whatsoever on the budget, was not accompanied by the resources or structure necessary for BPELS to fulfill its new mission. As it stands now, there will be no

**Government Update** continued on page 35

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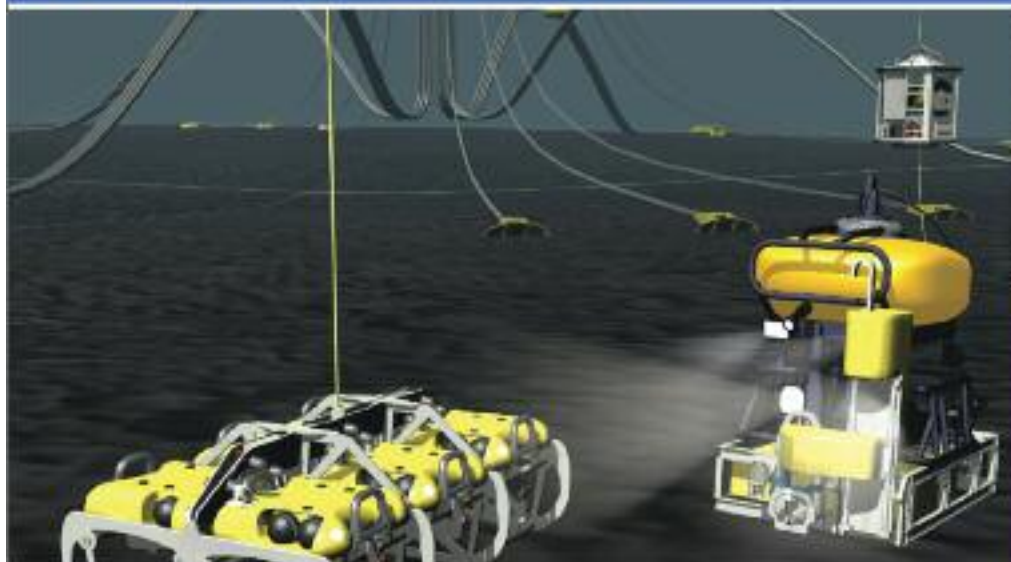


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geologists or geophysicists on BPELS, there will be no name change to reflect its new mission, and BPELS will not have the manpower to perform its new functions – only two personnel years were reallocated from BGG. Early discussions with BPELS personnel indicated that none of the standing committees, including the Exam Committee, will be continued. The net effect of all this is that geologists will soon be regulated by an agency that is ill equipped to handle the responsibility and arguably hostile to its new licensees.

**AGI Government Affairs Monthly Review  
(September 2009)**

**Committee Releases Human Spaceflight Review Summary**

The Review of the U.S. Human Spaceflight Plans Committee commissioned by President Obama earlier this year released the executive summary of their report this month. The committee, headed by the former CEO of Lockheed Martin, Norman Augustine, argues for sustained funding for the space shuttle, International Space Station, and human launch capabilities research.

The space station is set to be decommissioned in 2015, but the task force recommends extending use to 2020. However the space

shuttle, the only way to get U.S. astronauts to the space station, will retire at the end of fiscal year 2010 with no ready replacement. The task force recommends funding the shuttle through 2011 to complete already scheduled flights. They acknowledge the shuttle has to be retired, but with the best alternatives at least seven years away they suggest looking into commercial options.

A solid investment in a space program, the task force concludes, will spur progress in exploration to reach the end goal of returning to the moon and reaching Mars. International partnerships are highly encouraged as they can strengthen foreign relations and provided needed resources for the program.

The lack of a clear directive on how to develop a robust and meaningful space program angered Space and Innovation Subcommittee Chairwoman Gabrielle Giffords (D-AZ). She felt the only conclusion the committee reached was the already obvious disparity between NASA funds and their mission directives.

The spaceflight committee homepage includes updates and access to the report:

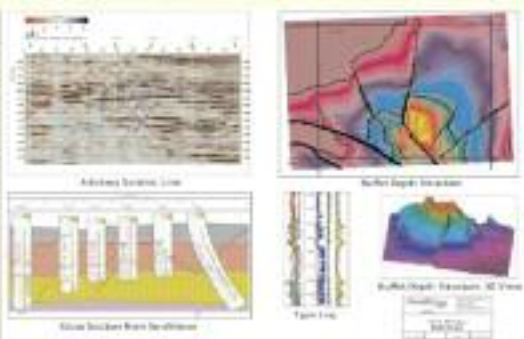
<http://www.nasa.gov/offices/hsf/home/index.html>

**Government Update** *continued on page 37*

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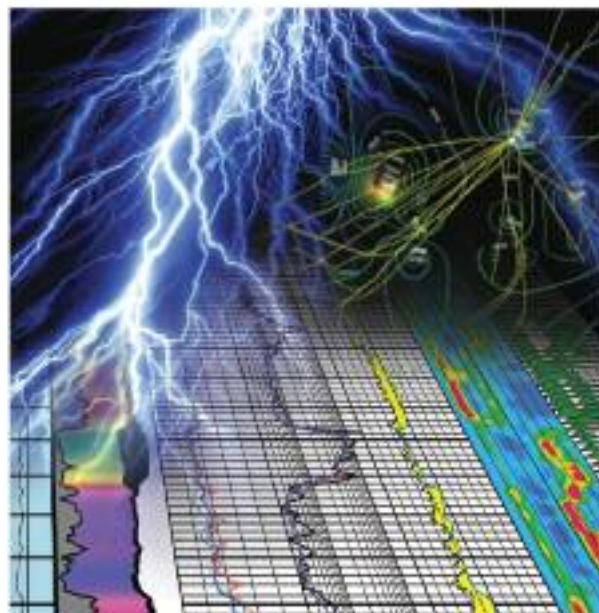
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### Further Endorsement For The Law Of The Sea

The Executive Office of the President has endorsed U.S. ratification of the UN Convention on the Law of the Sea. White House Council on Environmental Quality Chair Nancy Sutley, along with National Oceanic and Atmospheric Administration Administrator Jane Lubchenco and Coast Guard Commandant Admiral Thad Allen, wrote a column in the Seattle Times in support of accession. Their column called ratification a way to “participate in interpreting and applying the convention to the changing realities of the global maritime environment and preserves our ability to protect domestic interests including extending our continental shelf claims.”

The Law of the Sea (LOS) treaty is an international agreement that defines the rights and responsibility of nations in regards to the oceans and the seafloor. This 27 year old treaty has been ratified by most industrialized countries. The U.S. Senate has not ratified the treaty, even though past Administrations and President Obama have asked for ratification. An outspoken congressional supporter, Chairman of the Senate Foreign Relations Committee John Kerry (D-MA), hopes that his committee will proceed with ratification and that the full Senate will approve of the treaty in the near future.

### Competing Energy Bills Emerge In The House


Representatives Tim Murphy (R-PA) and Nick Rahall (D-WV) have introduced competing energy bills to overhaul onshore and offshore energy leases and revenue systems. Hearings were held in September on Murphy’s American Conservation and Clean Energy Independence Act (H.R. 2227) and Rahall’s Consolidated Land, Energy, and Aquatic Resources Act of 2009, or CLEAR Act, (H.R. 3534

The CLEAR Act would create a new Department of the Interior (DOI) agency to govern oil and gas leasing on federal lands, a task currently split between the Bureau of Land Management (BLM) and Minerals Management Service (MMS). It would pressure industry to quickly develop their leases and would add new fees. It also makes changes to offshore development rules, includes a commercial wind and solar leasing program, and boosts funding for ocean conservation and land acquisition.

H.R. 2227 is a bipartisan bill with wide support from Republicans and conservative Democrats in the House. It includes the Bush Administration plan for the outer continental shelf, which expands leasing into areas off all coasts. The revenue from offshore production, which Murphy estimates to increase to at

**Government Update** *continued on page 39*

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least \$2 trillion with the expanded area, would be distributed to states and various reserves. The reserves include a renewable energy fund to promote alternative energy development, an environmental restoration reserve, and a clean coal and carbon capture technology fund.

The CLEAR Act, while garnering some support, has many industry groups concerned about the proposed fee increases and environmentalists worried about a disconnect between the proposed leasing office and the land management side. Some moderates prefer the provisions in H.R. 2227, but have not expressly opposed the CLEAR Act.

The full text of H.R. 2227 is available from Thomas:

<http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h2227>:

The full text of H.R. 3534 is available from Thomas:

<http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.03534>:

## House Passes Wind Energy And Advanced Vehicle Bills

The Wind Energy Research and Development Act (H.R. 3165), which passed the House this month, would provide \$1 billion over five years for research into wind energy generation. This includes materials and turbine design, offshore applications, and reliability improvement. The bill's sponsor, Congressman Paul Tonko, (R-NY), extolled the potential for wind in the U.S. and described this bill as bringing the country closer to realizing that full potential.

The full text of the bill can be found here:

<http://thomas.loc.gov/cgi-bin/query/z?c110:h3165>:

With a vote of 312-114, the House passed the Advanced Vehicle Technology Act (H.R. 3246) to provide \$3 billion over five years for research and development of advanced vehicle technologies. Most of the prescribed technology is fuel efficiency and energy related. Approved amendments included adding recreational vehicles and farm equipment, public-private partnerships, reporting requirements, and expansion of the scope of technologies. The rejected amendment, proposed by Representative Paul Broun (R-GA), would have cut the bill by \$700 million. Broun argued that existing funding programs are addressing these needs. Despite the bill's cost, House Science and Technology Committee Chair Bart Gordon (D-TN) said it would aid in stimulating the economy and developing the next generation of vehicles.

The full text of H.R. 3246 is available from Thomas:

<http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.03246>:

## DOI Launches Climate Change Response Council

Interior Secretary Ken Salazar launched the Department of the Interior's (DOI) first coordinated strategy to address climate change impacts on September 14, 2009. This secretarial order (Secretarial Order No. 3289) addresses the impacts of climate change on water, land, wildlife, fish, and other resources.

The strategy includes a Climate Change Response Council of senior DOI officials, led by Salazar, to coordinate actions and facilitate better communication related to climate change within the DOI bureaus and offices and with other agencies. The council will oversee the Carbon Footprint Project, which is creating an emissions reduction program, and the Carbon Storage Project, which is working on both geological and biological storage techniques. Salazar is also creating eight regional climate change response centers to manage strategies and data for each region and engage the public. To focus on how climate change impacts drought, wildfires, invasive species, and migration patterns across land boundaries, he also created the Landscape Conservation Cooperatives.

This Secretarial Order builds upon Secretarial Order No. 3285 that was issued in March to promote the development of renewable energy on public land.

Press release for Secretarial Order No. 3289

[http://www.doi.gov/news/09\\_News\\_Releases/091409.html](http://www.doi.gov/news/09_News_Releases/091409.html)

Press release for Secretarial Order No. 3285

[http://www.doi.gov/news/09\\_News\\_Releases/031109c.html](http://www.doi.gov/news/09_News_Releases/031109c.html)

## DOI To Eliminate Royalty-In-Kind Program

Interior Secretary Ken Salazar cancelled the royalty-in-kind program, saying that in his view, the program has been "a blemish" on the department. The program allowed industry to bypass cash royalty payments by providing oil and gas directly to the Department of the Interior (DOI) instead. DOI reported last year that nearly a third of the royalty-in-kind program staff was receiving gifts and gratuities from oil and gas companies doing business with the agency. Representative Nick Rahall (D-WV) accused the employees of "cozying up with industry officials" rather than getting fair returns for taxpayers. Rahall was pleased with Salazar's announcement, having recently introduced his own bill (H.R. 3534) to give the federal royalty system a make-over, including termination of the royalty-in-kind program.

The American Petroleum Institute is opposed to terminating the royalty-in-kind program because they think the program is cost-effective and reduces paperwork. The DOI's Minerals Management Service has expressed similar views, saying the program simplifies royalty collections, keeps down administrative costs,

Government Update continued on page 41





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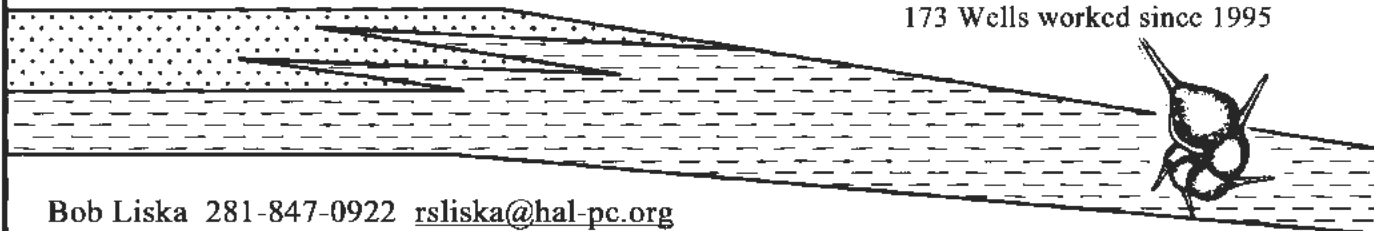


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and curtails conflicts with energy companies. Regardless, Salazar said a secretarial order to end the royalty-in-kind program will be issued within the next few weeks.

The full text of H.R. 3534 is available from Thomas at:  
<http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.03534>:

#### **UN Estimates Cost For Renewables In Developing World**

The 2009 World Economic and Social Survey “Promoting Development, Saving the Planet” issued by the United Nations (UN) in September estimates the cost of converting the world’s developing nations to renewable sources of energy will be between \$500 and \$600 billion a year for the next ten years. The total investment would represent around one percent of global GDP annually. This is a revised estimate and is much higher than an earlier estimate of about \$100 billion.

The report recommends a “Global Sustainable New Deal”, modeled on the one that drove the U.S. out of the Great Depression. This “New Deal”, according to the report, will require large-scale investment that will not easily be supported by developing nations. Funding will likely come largely from public funding, like a global investment program, in conjunction with partner-

ships, incentives, and innovative financing options. Another important requirement is the transfer of key renewable energy technology from those nations possessing the scientific and technical capital to help less developed nations. These recommendations are founded on the disproportionate degree to which developing nations will be exposed to the potential hazards of climate change.

The report was assembled by the Department of Social and Economic Affairs of the UN Secretariat and is published annually. The report argues that the combined management of climate change adaptation and planned economic development in developing regions will improve the environment as well as the economic outlook and stability of developing countries.

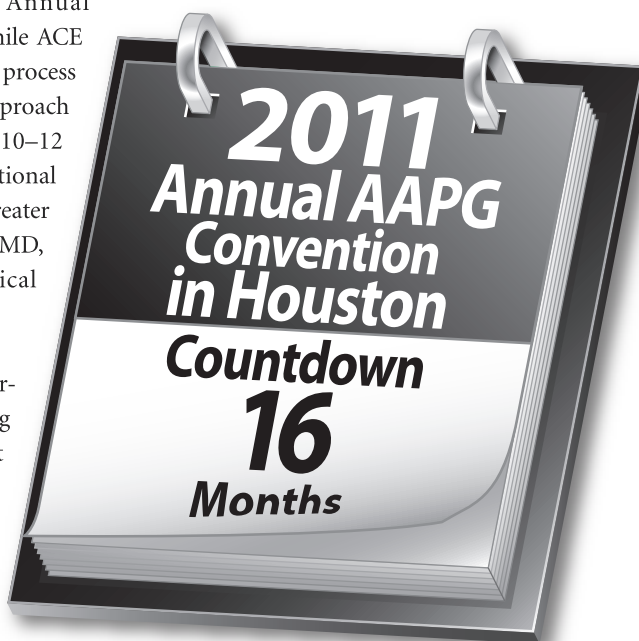
The responsibility of developed and developing nations to address climate change will be discussed this December at the UN Climate Change Conference in Copenhagen. This report will provide some basis for discussing the costs of developing a new climate change treaty to follow the Kyoto Protocol.

The survey is available at: <http://www.un.org/esa/policy/wess/>

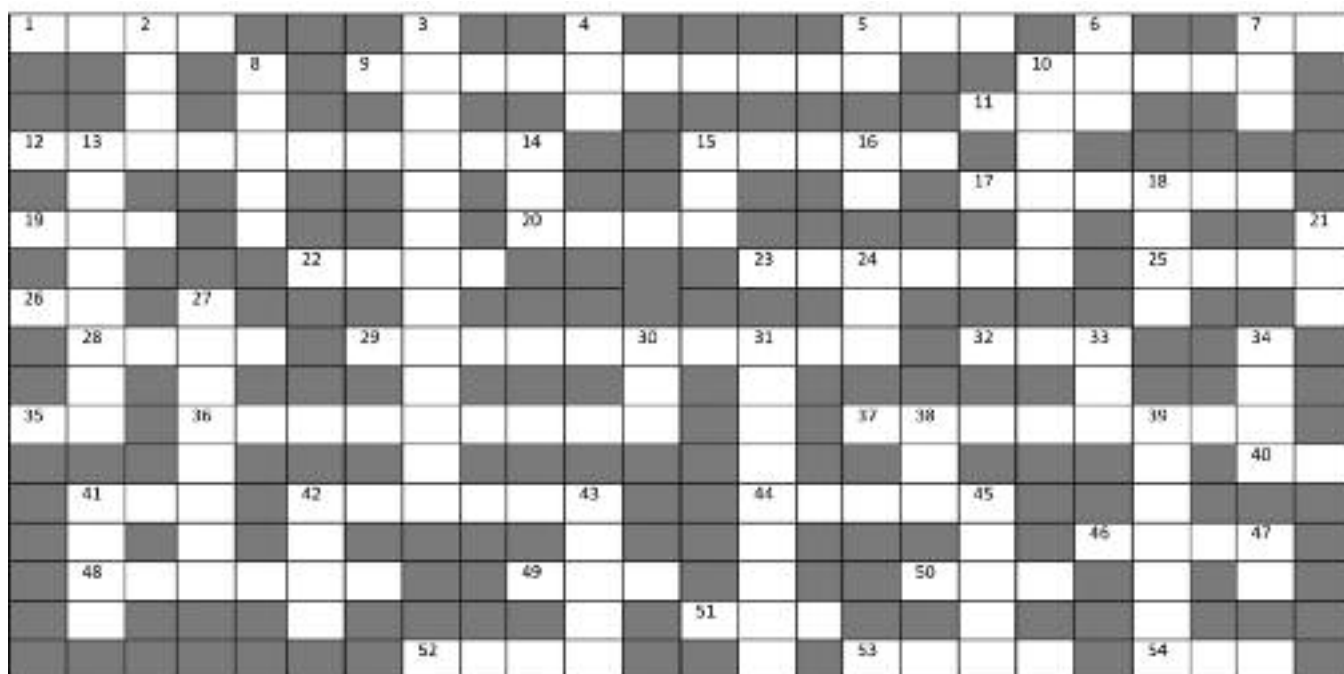
## **Countdown to AAPG**

**P**reparations are under way for the AAPG 2011 Annual Convention & Exhibition to be held in Houston. While ACE has been held in Houston before, the AAPG is using a new process to design and collect the technical program. The new approach allows for the technical program to be crafted around 10–12 themes, a method first used for the AAPG 2009 International Conference & Exhibition in Rio. This method results in greater synergy between the divisions and associated societies (EMD, DEG, DPA and SEPM) as well as an improved technical program.

The ability to create a positive and smooth-flowing conference is greatly enhanced by the participation of a strong pool of volunteers. If you are interested in volunteering at the committee level please contact Steve Levine (General Chair) [steve.d.levine@conocophillips.com](mailto:steve.d.levine@conocophillips.com), Marsha Bourque (General Vice Chair) [m22799@yahoo.com](mailto:m22799@yahoo.com), Linda Sternbach (Technical Program Chair) [linda.sternbach@gmail.com](mailto:linda.sternbach@gmail.com) or Carl Steffensen (Technical Program Vice-Chair) [carl.steffensen@bp.com](mailto:carl.steffensen@bp.com). ■



# December Crossword of Geologic Terms



**The HGS Board is offering a \$50 gift card to the first correct and completed crossword received by the HGS Business Office prior to the mailing of the January issue.**


## Across

- |  |   |
|--|---|
| 1-An opening through which volcanic material are extruded                            | 28-To place survey data on a map  |
| 5-A region in the Sahara deeply covered with shifting sand                           | 29-Having the form of a bunch of grapes                                       |
| 7-Rough and jagged lava flow   | 32-A group of conformable strata  |
| 9-A instrument used for measuring angles of slope, elevation, or inclination         | 35-Noble gas – Atomic Number 18   |
| 10-Principal ore of beryllium  | 36-Produced from a saline solution  |
| 11-Unit of acceleration  | 37-Having uniform properties in all directions                                |
| 12-An earthquake that originates near the focus of a larger earthquake               | 40-Noble gas – Atomic Number 54   |
| 15-A small magnifying glass used in the study of gems                                | 41-Medicinal spring   |
| 17-Deep steep-walled half bowl commonly associated with a glacial origin             | 42-Dark-colored mafic igneous rock  |
| 19-High rugged steep-side mountain   | 44-A continuous saltwater body that surrounds continents                      |
| 20-Self-crossing point on a contour line that forms two loops around adjacent pits   | 46-Vertical shaft open to surface   |
| 22-Part of heterococcolith with one large dimension, one intermediate, and one small | 48-Bivalve mollusk  |
| 23-A general name for a group of layer mica-like clay minerals                       | 49-Small island in lake or river  |
| 25-Horizontal passage from a mine to the surface                                     | 50-Form of water  |
| 26-Swedish term for esker  | 51-Long, narrow inlet or arm of the sea whose width and depth decrease inland |
|  | 52-Unsorted and unstratified drift  |
|  | 53-Series of contiguous townships   |
|  | 54-Transverse dune in the desert of Algeria                                   |



**Down**

- 2-A little valley with a stream
- 3-Produced elsewhere than its present place
- 4-A high isolated crag
- 5-Transition metal
- 6-Liquified mud
- 7-A flat inclined narrow shelf separating the nearly vertical side of an alpine glacier trough from the mountain slope
- 8-A type of topography formed through dissolution
- 10-Sulfate mineral
- 13-The most widespread group of minerals
- 14-A mountain that stands out prominently
- 15-Sheltered from the wind
- 16-Hydrogen ion concentration
- 18-Shorten form of rectangular area on a map bounded by parallels of latitude and meridians of longitude
- 21-Map projection
- 24-Acronym for lithophile elements
- 27-Stable area marginal to an orogenic belt
- 30-Naturally occurring material from which a mineral may be exacted for profit
- 31-Line on a plot of  $^{206}\text{Pb}/^{238}\text{U}$  versus  $^{207}\text{Pb}/^{235}\text{U}$  formed by data on phases that have lost lead or gained uranium during a period of time that is short compared with the age of the phase
- 33-Thick organic liquid
- 34-Variety of chalcedony
- 38-An inland body of salt water
- 39-Common rock forming mineral of basalt
- 41-Variety of chalcedony
- 42-Igneous intrusion less than  $100\text{km}^2$  and is a roughly circular plan
- 43-Floor of a coal mine
- 45-Hard, iridescent internal layer of a mollusk shell
- 47-Noble gas – Atomic number 10



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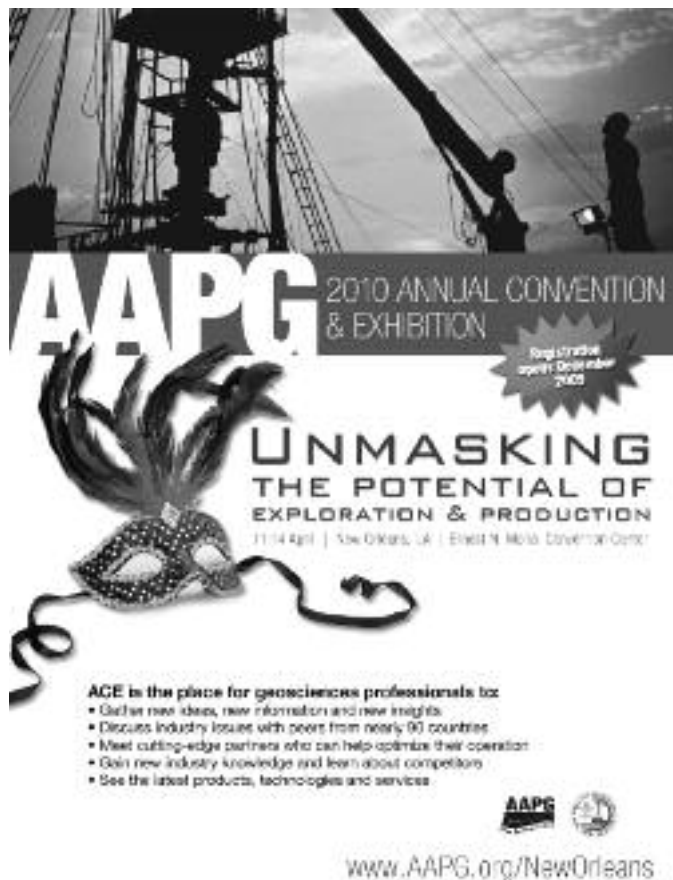
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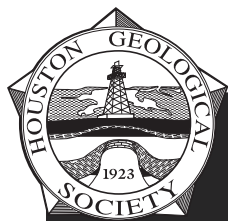
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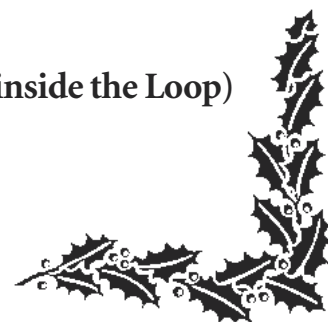
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**Text** should be submitted by email as an attached text or Word file or on a clearly labeled diskette in Word format with a hardcopy printout to the Editor.

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

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# Application to Become a Member of the Houston Geological Society

December 2009

## Qualifications for Active Membership

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

## Qualifications for Associate Membership (including students)

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

## Apply online at [www.hgs.org](http://www.hgs.org) and click on Join HGS

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

Mail this application and payment to:

*Houston Geological Society*

*14811 St. Mary's Lane, Suite 250 • Houston, TX 77079-2916*

*Telephone: 713-463-9476 Fax: 281-679-5504*

Payment method:

☐ Check, ☐ VISA, ☐ MasterCard, ☐ American Express, ☐ Discover

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

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Spouse's Name: \_\_\_\_\_

Email: \_\_\_\_\_

Job Title: \_\_\_\_\_

Company: \_\_\_\_\_

Company Address: \_\_\_\_\_

Work Phone: \_\_\_\_\_ Fax Number: \_\_\_\_\_

Circle Preferred Mailing Address: Home Office \_\_\_\_\_

Professional Affiliations: \_\_\_\_\_

☐ AAPG member No.: \_\_\_\_\_

Professional Interest:

☐ Environmental Geology ☐ North American E&P (other than Gulf Coast)

☐ International E&P ☐ Gulf Coast E&P (onshore & offshore)

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School \_\_\_\_\_

Degree \_\_\_\_\_ Major \_\_\_\_\_ Year \_\_\_\_\_

School \_\_\_\_\_

Degree \_\_\_\_\_ Major \_\_\_\_\_ Year \_\_\_\_\_

Earth Science Work Experience \_\_\_\_\_

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_

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

Name: \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_



# Houston Petroleum Auxiliary Council News

*Winona LaBrant Smith, HGS Liaison*

The Holiday season is beginning to unfold. After the incredible event that Edie Bishop, First Vice president and Social Chairman, and her committee executed for HPAC at the Braeburn County Club on September 18, we are anticipating an even more stimulating event on December 4, 2009, (10:30 am – 1:30 pm) at Lakeside Country Club, 100 Wilcrest Drive. The Kingsmen Chorus will perform with their Director, John Devine, who is one of the winners of the Best Quartet in America Award. This Group, a four- part harmony, was formed about 15 years ago and will have around 20 members performing. Nancy Frye and Kathy Duncan will chair this event with Bernadine Billard, Phyllis Carter, Linda Dobbins, Susan Graul, Elinor Macmillan, Donna Parrish, Sandra Pezzeta, Nan Pye, Linda Steen and Helen Thomas completing the committee.

HPAC is virtually a cultural garden of exciting members who are involved in all walks of life. You exit the events stimulated after having visited with members like Martha Lou Broussard. Martha Lou was the first woman to graduate from Rice University's geology department; she had a successful career in the oil industry, working for the Shell Development Company, ERICO ND, and Rice University, where she worked as the Department of Earth

Science department coordinator for eight years until her retirement. She is the department's alumni coordinator. For many years Martha Lou has led a Spring field trip for the members of HGA, Geowives and their spouses. They have traveled from Spindletop to Gonzales and many points in between. All members of HPAC are welcome. Martha Lou is also Co-chair of the HPAC Book Group. Martha Lou is a very cosmopolitan individual as she has spent time on foreign assignments and travelled extensively. She is an avid supporter of both the Geological Societies and their Auxiliaries. Plan to attend some of the HPAC events where you will have the opportunity to meet members like Martha Lou Broussard!

Geologists, please encourage your spouses to join HPAC, where they will have the opportunity to meet other wives whose husbands are Geologists, Geophysicists, Engineers and Landmen. They will participate in stimulating programs, delicious lunches and friendly fellowship.

For your convenience, a HPAC membership form is included below. If you have any questions, please contact Winona LaBrant Smith at 713-952-2007. ■

## Geo-Wives

*Lois Matuszak, President of GeoWives*

Mark your calendars! On Thursday, November 12, at 10:00 a.m. we will have a guided tour of the NEW St. Basil the Great Greek Orthodox Church at 1100 Eldridge Parkway. Afterwards we will have a spaghetti lunch with salad and coffee or tea – cost \$7.00. Dessert is extra. HPAC members, friends and husbands are invited to join us. Reservations should be sent to Jackie Smith. Phone: 713-771-5427 or email: smithjandj@msn.com

On December 14, at 11a.m. we will have the Geo-Wives “Christmas Party and Ornament Exchange” at the home of Daisy Wood. 8800 Woodway Drive #7 Houston, 77063. Guests are welcome. Everyone, including guests, please bring an ornament to exchange. Reservations are to be made with Daisy Wood. email: daisymallia@aol.com or Phone 713-977-7319. ■

*You are invited to become a member of*

# HPAC

**2009–2010 dues are \$20.00** Mail dues payment along with the completed yearbook information to **Carol Gafford**, 13323 Misty Hills Drive, Cypress, TX 77429

### YEARBOOK INFORMATION

Last Name	First Name	Name Tag
Spouse Name	Name Tag	HGS Member's Company
Home Phone	Business Phone	Business Fax
Street Address	City	Zip
Email Address	Home Fax	

Please choose a committee assignment if you are interested.

- |  |                                       |                                       |                                     |
|--|---------------------------------------|---------------------------------------|-------------------------------------|
| <input type="checkbox"/> Fall Event      | <input type="checkbox"/> Yearbook     | <input type="checkbox"/> SOS          | <input type="checkbox"/> Membership |
| <input type="checkbox"/> Christmas Event | <input type="checkbox"/> Spring Event | <input type="checkbox"/> Notification | <input type="checkbox"/> Game Day   |
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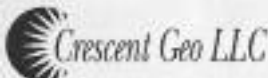
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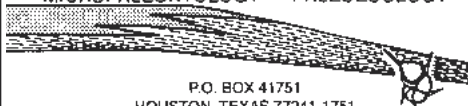
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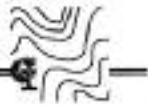
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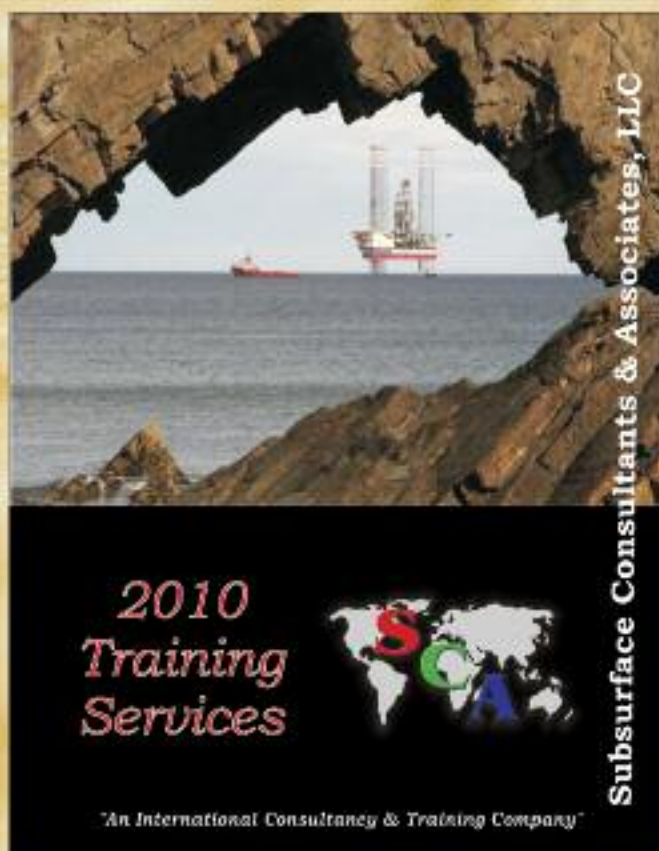
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9 - 11 Quality Control for Subsurface Maps (QCTs)  
15 - 19 Applied Subsurface Geological Mapping  
22 - 26 Practical Interpretation of Open Hole Logs

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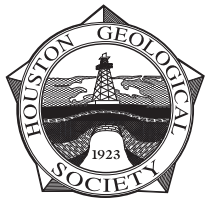
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