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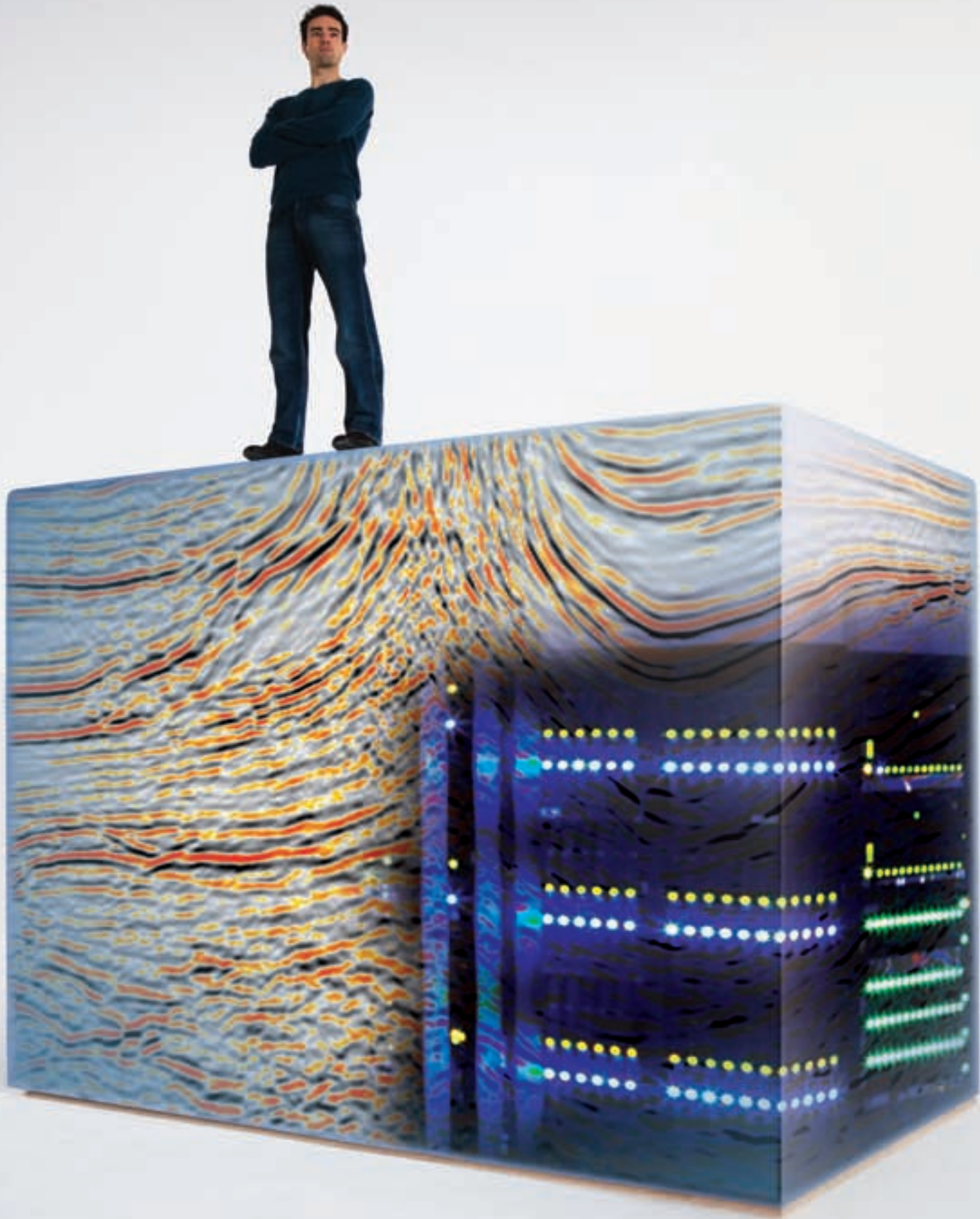
EXPLORER

JANUARY 2009



Spanning the Globe
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On the cover: No, those aren't photos of Australia and Iran you see – but the words capture perfectly this month's EXPLORER theme: World Developments. Check out the stories dealing with the significant discoveries of 2008 (*that's* where you'll find Australia and Iran), or specific stories dealing with places like offshore Brazil, the East Georges Bank Basin or British Columbia. Incidentally, the main photo is from the Ootla shale play in northeast British Columbia (see related story, page 10) and the inset photo was snapped in the active and successful arena that is Egypt. Both photos courtesy of Apache Corp.

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PRESIDENT'S column

Discussion Needs Climate Change

By SCOTT W. TINKER

The new year offers an opportunity to face new challenges. Because I did not receive enough holiday greeting cards, I decided to write about climate. That should fill the "in box!"

Recently I was confronted by a friend regarding my "ignorant" views on global warming – seemingly because I am president of the AAPG. I don't think the friend knows much about my political views, much less my understanding – or lack thereof – of climate science, paleoclimate, carbon sequestration or other areas of salient research. But she knows I am president of the AAPG and thus may be "climate challenged."

Welcome to the global warming debate, where science, politics and passion have become so entwined that they may be impossible to separate, and otherwise reasonable people on both "sides" of the issue can become ardently irrational.

Are you a believer or a denier?
Friends, these are not scientific terms.

* * *

I'll begin with a few contextual disclosures.

I view science, crudely, in terms of questions of curiosity: Why? How?

Questions can lead to hypotheses ("theories" in the vernacular), which can lead to experimentation, data collection, reduction, interpretation and conclusion. Interpretations and conclusions are then challenged, tested, repeated and, perhaps, result in scientific theories, which are fact-based bodies of evidence that are substantiated and made robust by additional data and testing, such as the theory of plate tectonics or the theory of evolution.

I view politics in terms of questions of economics and people. Who? What?

Well-intended to be sure, but at the end of the day, if you follow the money and opinion polls, you usually can sift through much of the hyperbole, passion and philosophy to unravel the underpinnings of political discourse.

Passion involves powerful emotions, boundless enthusiasm and, taken to the extreme, zeal. When passion *becomes* zeal, reasoned arguments are often difficult. Zeal and objectivity do not often good bedfellows make.

Within this context, is it possible to deconvolve science, politics and passion in the global-warming conversation?

At this point, I am doubtful.

However, in the spirit of giving it a try, let me pose some questions intended simply to help frame the conversation and move a tad closer to a set of policy decisions that make scientific and economic sense. Colleagues with a wide array of backgrounds and expertise are doing similar things as we all work to develop tangible, realistic actions.

Is It Happening? Is It Bad?

✓ Is the earth warming? If so, how fast?

This is a question for science. Most agree that the data, in the aggregate, indicate an overall warming trend. We all know that the earth has warmed many, many times in the past and, as in the past, it will likely cool again. This is not the major issue.

✓ Has anthropogenic CO₂ caused

warming in the second half of the 20th century to be greater than it would have been without anthropogenic CO₂?

Again, a question for science. It is



Tinker

tougher to prove causation, but many agree the data, to the extent and quality that they exist, indicate "yes." However, we are dealing with a highly complex, nonlinear system that is extremely difficult to model.

✓ Is global warming

"bad," or is it possible warming could also be "good?" In other words, could there be geographic winners and losers as the earth warms?

These are questions for science, economics and politics. The answers may be more complex than generally thought.

What Can be Done?

✓ If warm is more bad than good, is there something that can be done technologically to mitigate (slow/reverse) the anthropogenic component of warming?

A question for science. Many, including members of AAPG, are working on this challenging problem, including carbon capture and storage, measuring, monitoring and verifying, and compression, transport and injection infrastructure.

What Should be Done?

✓ If there are technological solutions, what is the probability of success – and can the solutions be accomplished in time to mitigate the anthropogenic component of warming?

A question for science and economics. Many are beginning to work on this problem.

✓ If there are technological solutions to mitigate warming, can we afford to implement those solutions?

A question for economics and politics. Some are discussing this problem.

✓ Rather than mitigating warming, would investments be better used to prepare and adapt? What is the proper balance between mitigation/adaptation?

Questions for science, economics/politics and philosophy.

Not many are discussing this critical issue openly yet.

✓ Given that both mitigation and adaptation will be expensive – and at the same time will create new economic opportunities – how should costs be borne?

A question for economics and politics. Cap and trade is the popular mantra, but this solution struggles to be transparent, avoid waste, be predictable, use revenues wisely, permeate the economy and be reasonably stable.

A carbon tax comes closer, but politicians to date have not shown the fortitude to tax, and industry leaders are mostly keeping mum, although some are beginning to speak up about their preference for a tax.

See **President**, next page

Tinker Letter Suggests Bridge to Future

A coordinated approach to energy, economic and environmental policies was called for in a letter delivered to U.S. President-elect Barack Obama and his transition team by AAPG President Scott Tinker.

Tinker said it is important to "build a fossil energy bridge to an alternative energy future," and he offered some facts and ideas to approach the challenges.

In addressing these challenges, Tinker noted:

- ✓ Global energy demand continues to rise, reflecting growth in population and industrialization. Fossil fuels, such as oil, natural gas and coal supply 87 percent of global energy needs.

- ✓ The global economy is fueled by affordable, reliable energy. If the economy is not healthy, the environment suffers. An

interesting paradox: A healthy environment requires a healthy economy, that economy requires energy, and today that energy is largely fossil fuels.

Ideas offered for the president-elect's consideration were:

- ✓ An abrupt, unilateral shift of our energy portfolio is both unwise and unnecessary, especially when we can leverage the fuels that we have to expand alternatives – a fossil fuel bridge to an alternate energy future.

- ✓ It won't happen in four or even eight years – not because of entrenched interests or a lack of will, but rather because of the size and scale of global energy markets and infrastructure.

- ✓ The term "energy independence" fails to recognize that in a globalized world, we are interdependent.

Tinker said it would be "far better to

advocate energy security," which would emphasize:

- ✓ Enhanced energy efficiency.

- ✓ Broad diversification of the energy portfolio.

- ✓ A global carbon price that is transparent, stable, economy-wide, uses revenues wisely and coordinated globally. (Does cap and trade satisfy these criteria?)

- ✓ Advancing global energy trade and investment, such as LNG, clean coal, advanced nuclear and scalable renewables.

- ✓ Dialog between developing and developed nations.

- ✓ Balanced education, training and R&D policies.

"Energy security is an achievable goal, both here in the U.S. and across the globe," Tinker wrote, "but the U.S. must lead by balancing and integrating its economic,

energy and environmental policies to deliberately and progressively achieve this shift to a new energy future.

"If we do not lead with a steady and well-considered approach, the world will either continue to use fossil fuels almost exclusively or make abrupt unilateral leaps into an alternative future, either of which would have unintended and severe consequences.

"In 2008 my energy-related travels have taken me to four continents to interact with governments, industry and academe," he continued. "Your election has created a global buzz unlike anything I've seen before. It is an exciting opportunity for the U.S. to provide global leadership."

The letter is available at:

http://www.aapg.org/geoDC/recent_events/0812dec_ObamaLetter.cfm.

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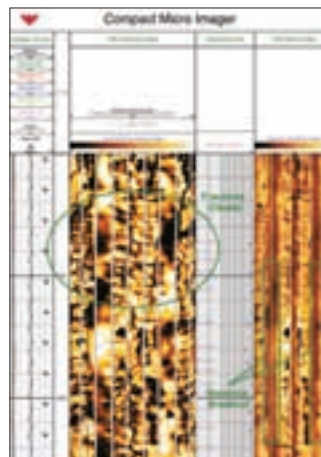


Image data obtained in a horizontal CBM (Coal Bed Methane) well with CMI on Well Shuttle.


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President

from previous page

Will It Matter?

- ✓ Who should be required to participate in global carbon-reduction protocols?

A question for economics and politics. Kyoto, although well intentioned, had problems. We can do better.

- ✓ If major economies, particularly developing nations, do not participate, will partial mitigation have enough impact on atmospheric CO₂ to matter?

A question for science. Many think it won't have enough impact.

* * *

Regrettably, these are not easy questions, because they involve the difficult challenge of building bridges between science, industry and politics amid a sea of passion.

Even if science and model forecasts are 100 percent certain, which my climate modeling friends assure is not the case, resultant mitigation/adaptation options and decisions are not necessarily clear.

The atmosphere needs to change in the climate change discussion if we are to determine and implement well-considered solutions. It is a massively complicated issue. To oversimplify is to underestimate. It will take everyone working together with open minds, an interest in hearing opposing views and a willingness to compromise.

It will take leadership.

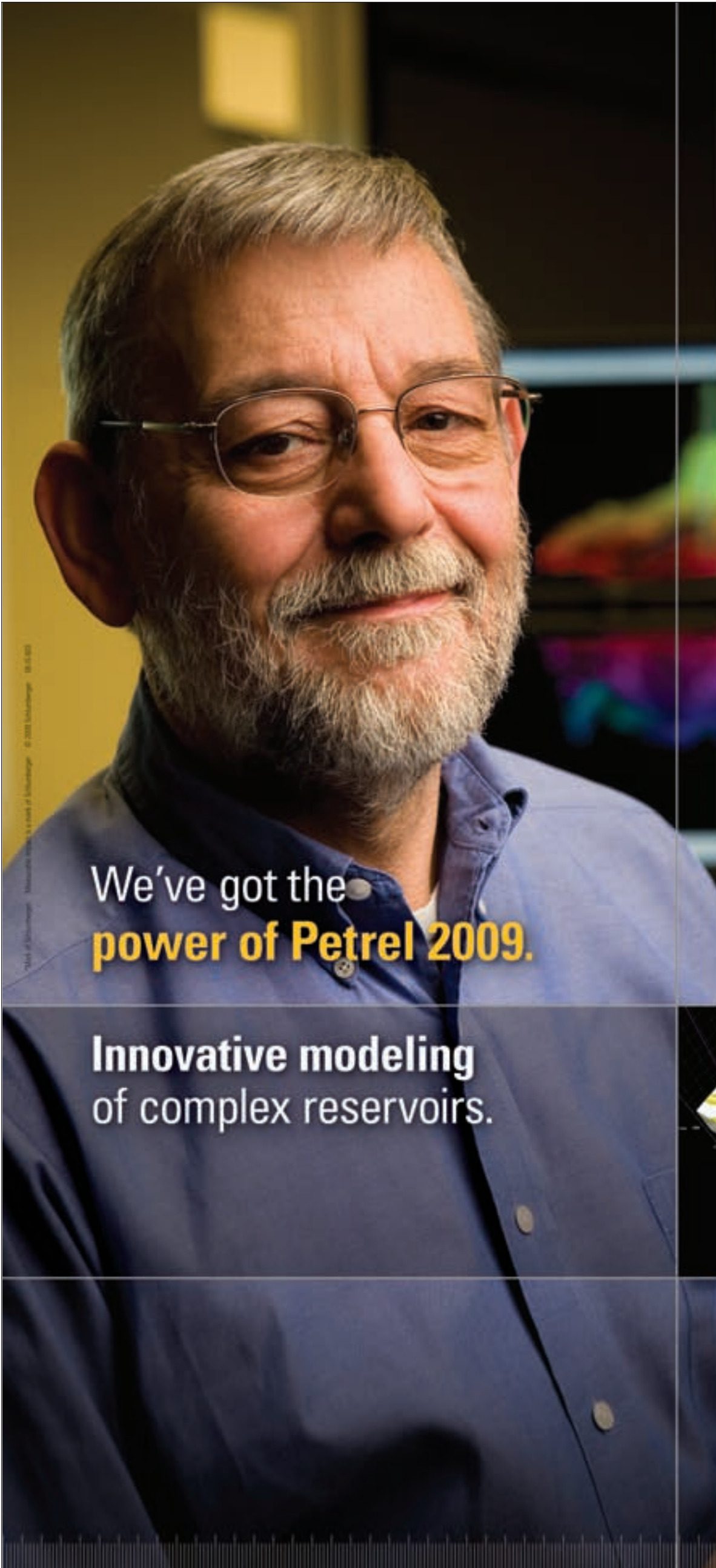
AAPG members – scientists, engineers, business leaders, politicians, economists and lawyers from around the world – your voices are critical as the global dialog evolves from "Is it happening?" to "What can be done?" and "What should be done?"

AAPG's Global Climate Change Committee convened forums in San Antonio (April 2008) and Cape Town (November 2008), with various climate experts discussing the state of the science regarding the question, "Is it happening?"

The GCCC is now moving toward forums that address "What can be done?" and "What should be done?" in Denver (this June) and New Orleans (2010). AAPG members have a strong role to play in these areas.

Let's help lead.





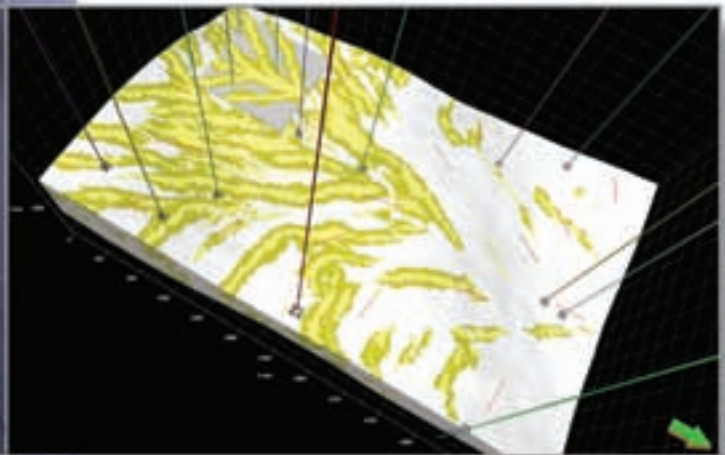
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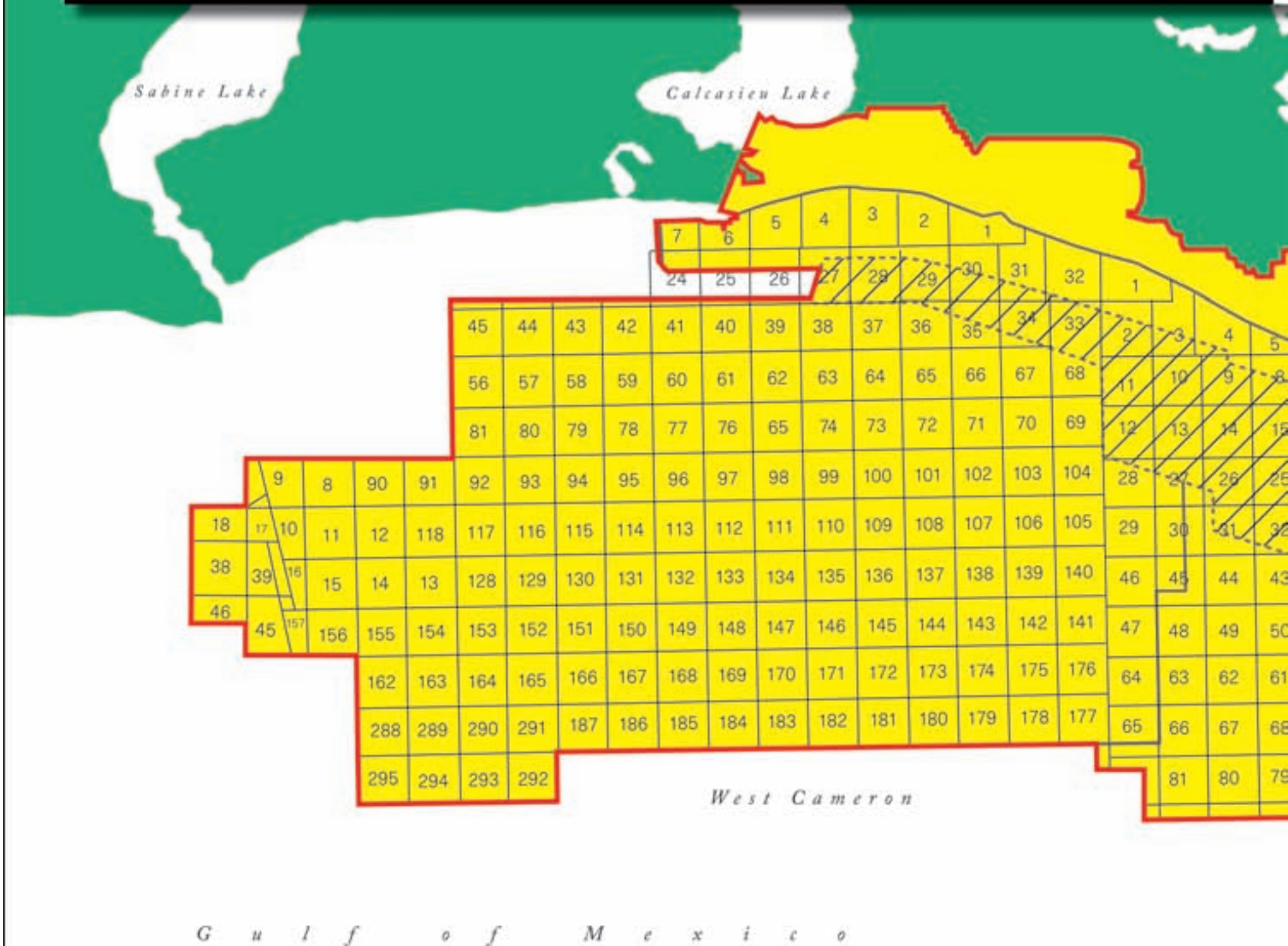


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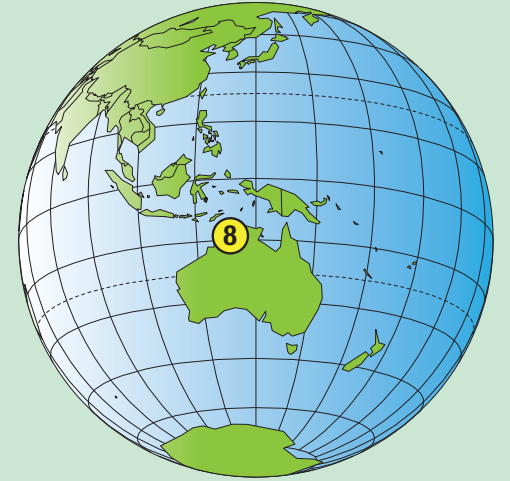
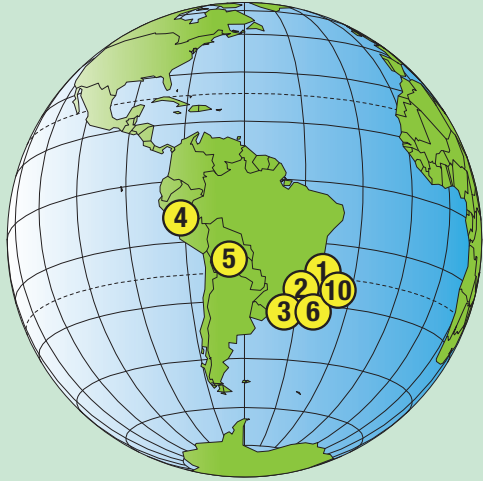
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TOP 10 DISCOVERIES OF 2008

Rank	Region	Country	Basin	Field	HC Type	Prod. Status	Current Operators	Disc Date
1	Latin America	Brazil	Sao Paulo Plateau Sub-basin (Santos Basin)	Iara	Oil, gas	Appraising	Petroleo Brasileiro SA (Petrobras)	Sept.
2	Latin America	Brazil	Sao Paulo Plateau Sub-basin (Santos Basin)	Jupiter (1-RJS-652-RJS)	Gas, condensate, oil	Appraising	Petroleo Brasileiro SA (Petrobras)	Jan.
3	Latin America	Brazil	Sao Paulo Plateau Sub-basin (Santos Basin)	Guara	Oil, gas	Appraising	Petroleo Brasileiro SA (Petrobras)	Aug.
4	Latin America	Peru	Urubamba Sub-basin (Ucayali Basin)	Kinteroni 1X	Gas, condensate	Discovery	Repsol Exploracion Peru SA	Jan.
5	Latin America	Bolivia	Chaco Sub-Andean Zone (Chaco Basin)	Huacaya	Gas, condensate	Producing	Repsol YPF E&P Bolivia SA	Jan.
6	Latin America	Brazil	Sao Paulo Plateau Sub-basin (Santos Basin)	Bem-Te-Vi	Oil, gas	Discovery	Petroleo Brasileiro SA (Petrobras)	May
7	Middle East	Iran	Zagros Fold Belt (Zagros Province)	Balaroud 1	Oil	Discovery	National Iranian Oil Co. (NIOC)	July
8	Australasia	Australia	Sahul Platform (Bonaparte Basin)	Blackwood (MEO) 1	Gas	Appraising	TSP Arafura Petroleum Pty. Ltd.	Feb.
9	Africa	Egypt	Nile Coastal/Deep Water Sub-basin (Nile Delta Bsn)	Satis 1	Gas	Discovery	BP Egypt Oil Co.	Feb.
10	Latin America	Brazil	East Campos Sub-basin (Campos Basin)	Wahoo	Oil, gas	Discovery	Anadarko Petroleum Ltd.	Sept.



Provided by IHS Energy (as of Nov. 30)

Latin America tops discoveries list

'08 a Year of Ecstasies and Agonies

By LARRY NATION

AAPG Communications Director

On the opening day of trading in 2008 oil hit \$100 a barrel for the first time. On July 7 West Texas Intermediate hit over \$150 and settled at \$145.29.

At that time there was much talk of "peak oil," and speculation by huge banks and hedge funds that were blamed with inflating the price of a crude by as much as 60 percent.

But by the end of 2008 oil had hit five-year lows, shedding over \$100 a barrel, as the global economy ran out of gas – figuratively, of course.

Companies that had budgeted on \$80 oil were at mid-fiscal year cutting way back on capital expenditures, shutting down projects and stacking rigs.

In December, Merrill Lynch predicted that oil prices are likely to keep falling until well into 2009 and could reach \$25 a barrel before recovering.

Its research report also said oil prices should begin to rally in the second half of 2009.

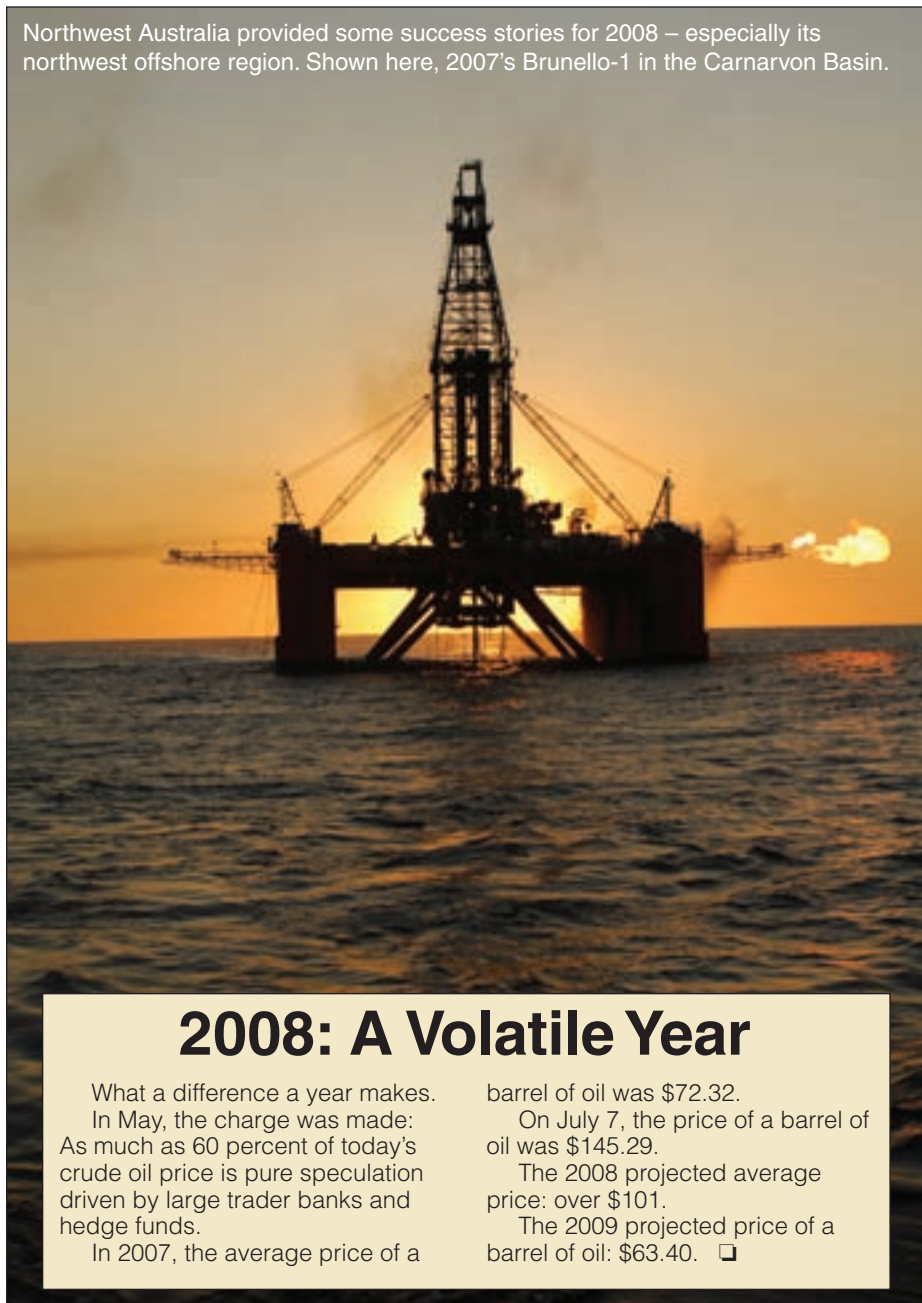
But Merrill Lynch, one of the best-known securities houses in the world, was itself a casualty of the economic meltdown of 2008. The forecast was issued just one hour before it was announced that its shareholders voted to be acquired by Bank of America. (We're pretty sure they didn't predict that this time last year.)

With a backdrop of dramatic global change in '08 that recorded both thrills and agonies, there were some historic discoveries.

"Amidst the demands of a deepening global economic recession the oil industry also faced dwindling access to supplies and slowing production," said Ken White, senior editor at IHS Energy International Oil Letter. "Yet against the odds, the industry managed to achieve significant levels of success.

"This is particularly true of Latin America," he added, "where Brazil had

Northwest Australia provided some success stories for 2008 – especially its northwest offshore region. Shown here, 2007's Brunello-1 in the Carnarvon Basin.



2008: A Volatile Year

What a difference a year makes.

In May, the charge was made: As much as 60 percent of today's crude oil price is pure speculation driven by large trader banks and hedge funds.

In 2007, the average price of a

barrel of oil was \$72.32.

On July 7, the price of a barrel of oil was \$145.29.

The 2008 projected average price: over \$101.

The 2009 projected price of a barrel of oil: \$63.40. □



White

an outstanding year recording five of the top 10 hydrocarbon discoveries of 2008 according to the IHS listing (see chart)."

At the top of the listings is the Iara discovery drilled by Petrobras in the Santos Basin with reserve estimates of

3.5 billion boe, prompting comments last May by the president of Brazil about possibly joining OPEC.

White also noted that national oil companies operated 50 percent of the top 10 discoveries based on reserves.

As for 2009, White said the major players "have found themselves with large cash assets, while smaller exploration companies are finding it almost impossible to raise necessary funding to complete desired work programs.

"There is growing evidence of shrinking capital expenditure budgets going into 2009, a year that seems likely to see the market in predatory mood."

Predatory is a good description, since the global economy has become more of a jungle than a marketplace.

But in the rarified atmosphere of triple-digit oil with (at one time) no end to the price trajectory in sight, 2008 was undeniably a watershed year of change, one that definitely will be remembered in history.

An extensive country-by-country listing can be accessed on the AAPG Web site in the EXPLORER area. □

Photo courtesy of Apache Corp.



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Extensive acreage has potential**Shale Plays Make BC Feel Cozy**

By DAVID BROWN
EXPLORER Correspondent

It might be winter in Canada right now, but British Columbia couldn't be hotter.

Recent drilling there has revealed two unconventional gas plays in the province with superstar appeal similar to the Haynesville and Marcellus shales in the United States.

The first play targets the Devonian Muskwa and Evie shale formations of the Horn River Basin, in British Columbia's far northeast corner. It's a remote and largely undeveloped area where natural gas leasing has taken off astronomically.

The second involves the Lower Triassic, siliciclastic Montney formation just to the south of the Muskwa play in the Fort St. John-Dawson Creek area. Production extends eastward across the border into Alberta.

Together these plays cover hundreds of square kilometers – most of it largely untapped for unconventional potential.

"We'll probably be producing out of that area 40 years from now, because it's such a huge area and these shales produce for years and years," said Vic Levson, executive director of resource development and geoscience for the British Columbia Ministry of Energy, Mines and Petroleum Resources (EMPR).

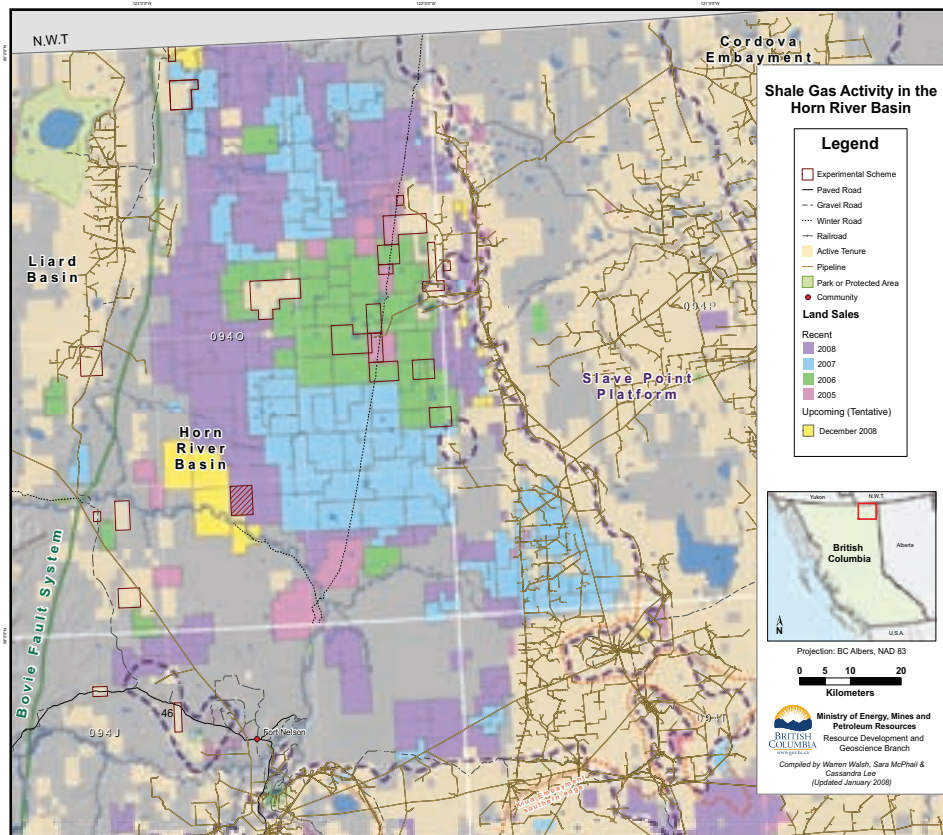
Barnett Similarities

In many ways, the Canadian plays are similar to unconventional resource plays in the United States. They're driven by advances in horizontal drilling and fracture stimulation techniques that have

opened up low-perm formations for exploration.

The Horn River Muskwa shale resembles the North Texas Barnett Shale, according to Levson.

"It's similar to the Barnett in many ways," he said. "If you look at the thickness, quartz content, permeability



and organic content, it's pretty similar in those parameters."

Gas content substantially favors the Muskwa, although it's too early in the play to predict likely recovery percentages.

"In comparison between the Muskwa and Barnett, the gas content at the end of the day is higher in the Muskwa," Levson said. "But recoverability is still up in the air."

Companies working the area include Apache, Devon, EnCana, EOG Resources, Nexen and others.

In December an EOG executive said prospects in the Horn River Basin shales look "better than the Barnett" based on early drilling results.

The company has estimated its own recoverable gas resource in the play at six trillion cubic feet, and Devon Energy said it could have 5-8 Tcf.

We're Talking Big

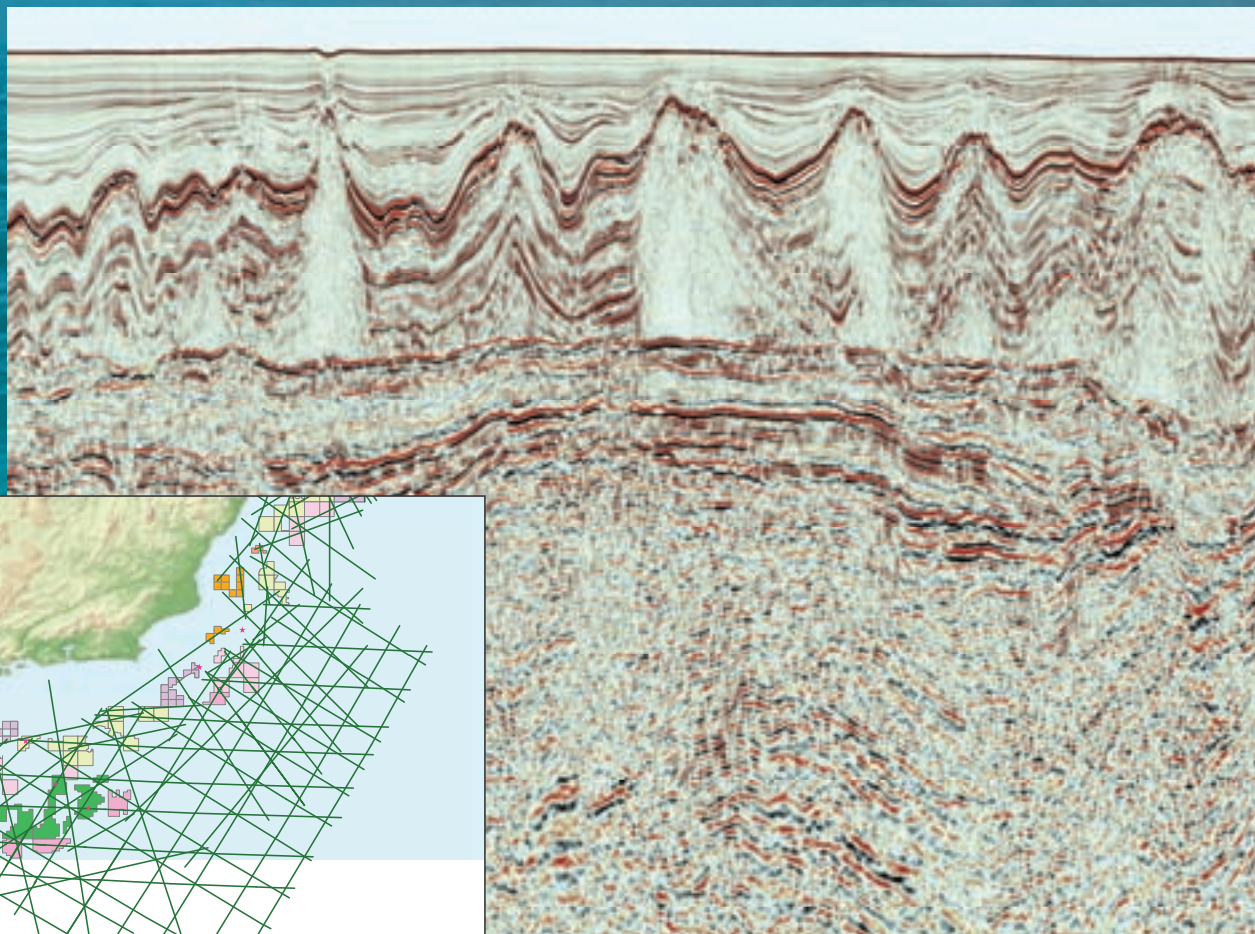
What could set the Muskwa, Evie and related plays apart is the size of the prospective area and the possibility of establishing a larger high-production core than in the Barnett.

The total play area extends to a carbonate bank edge on the southern and eastern margins and to the Bovie Fault to the west.

"We've done work in mapping it out, and it's an extensive shale," Levson said.

More drilling and testing will be needed to define the play, however. And

See **British Columbia**, page 12

**Brasil Santos & Campos
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British Columbia from page 10

unlike the Barnett, the Horn River play region is sparsely populated with little development, and lacks supporting infrastructure.

"In the core area of the basin there's not a lot of roads – they're putting roads in now," Levson noted. "It's quite remote."

Also, additional gathering systems will have to be built for new production. Thanks to earlier drilling in other formations, primarily in carbonate reefs and banks, there are pipelines around the basin, he said.

With a combination of soggy, semi-bog conditions and little access structure, winter has become prime development time for the play.

"It's very boggy, and of course it freezes solid in the winter, so there's been

more winter activity," Levson said.

Just to the south, the Montney shows a different character with a different set of challenges for explorers. It can be sandy, silty or shaly, based on geographic location and position within the formation.

"It's a siltstone that becomes more of a shale as you move west toward the mountains. Some people are calling it a hybrid play," Levson said.

He termed it a combination of a shale play and a tight sands play, or more precisely, a "tight silt."

"There's been a lot of activity in that area for a long time, but not specifically in the Montney. People would drill through it," Levson said.

"It's probably a good five years ago that companies first started to take a hard look at the formation," he added.

Despite promising potential, the play slumbered until horizontal drilling was applied. Now wells have tested up to 6.4 million cubic feet a day, with some wells

showing high liquids production.

"Recently people have been putting horizontals into the Montney and that's changed the whole picture," Levson said. "It's resulted in an order of magnitude increase in production."

The play extends from the foothills and trends northwesterly, he noted. Leasing for the Montney has picked up in both British Columbia and Alberta.

"The Montney thickens and deepens substantially to the southwest – the western edge has a depth constraint," Levson said. "On the east side, by contrast, it's shallower."

"Companies have been primarily working in the southern part of the play, where the infrastructure is located," he added.

Recent successes have drawn a long list of players to the area.

"You name it – just about everybody who can get in is working there," Levson said.

Explorers in the play area also have eyed the Middle Triassic Doig formation, another silty-shaly prospect.

"One zone is quite phosphatic. They call it the 'Doig Phosphate.' So that's another area of interest. When you actually look at the rocks, though, they're not that much different," Levson observed.

Potential and Concerns

An earlier study by the ministry's EMPR group identified a number of potential shale gas formations in northeastern British Columbia:

- ✓ Lower Cretaceous: Wilrich Moosebar, Buckingham.
- ✓ Jurassic: Fernie Shale, Nordegg.
- ✓ Upper Triassic: Pardonnet.
- ✓ Middle Triassic: Doig Phosphate.
- ✓ Lower Triassic: Montney.
- ✓ Lower Carboniferous/Upper Devonian: Exshaw, Besa River, Muskwa, Fort Simpson.

Gas-in-place for Devonian shales was estimated at 500 Tcf, highlighting the appeal of the 1.28-million-hectare – about 3.16-million-acre – Horn River Basin. The full Montney-Doig play extent could be more than twice as large, over seven million acres or 2.8 million hectares.

Taken together, the Devonian and Triassic plays provide a huge area for drilling, which is still in the early stages. All resource and production estimates are likely to change as exploration and development continue.

Environmental considerations in the area include sourcing water for drilling and for anticipated high-flow fracturing needs.

"The supply of water is an issue," Levson said. "Where's the water going to come from? We've got a pretty good handle on that, but we're still working on it."

A likely solution to water supply is locating subsurface aquifers, although "they aren't always where you need them," he noted.

The remoteness of the plays brings less worry about potential disruption of inhabited areas. Also, shale-gas players already have developed a small-footprint drilling approach.

"Because you can drill so many wells from one pad, that (disruption) might be less than the drilling we have now in some areas," Levson said.

Let's Make a Deal

With so much interest in northeastern British Columbia, some government issued land rights have gone for more than \$10,000 an acre.

"The land sales have been just phenomenal. This year in B.C. we are over \$2.5 billion," Levson said.

Lower natural gas prices and constrained capital might slow the pace of drilling in the province, but won't stop it. Short-term fluctuations have a limited influence on play areas that will take decades to develop.

"So far, we haven't seen much impact. These are longer-term prospects – a lot of the capital was already committed," Levson noted.

"In relation to other areas, B.C. is still seen quite favorably as a place for the industry to invest its money," he said.

Conceptually, the idea of gas-rich resource plays in northeastern British Columbia isn't new.

With just the right combination of geological understanding, horizontal drilling advances, new completion techniques and industry interest, those plays are finally reaching full launch.

"It's exciting, and it means a fair amount of work for us," Levson said.

"It's really neat to see these things take off," he added, "because we've been encouraging them for years." □

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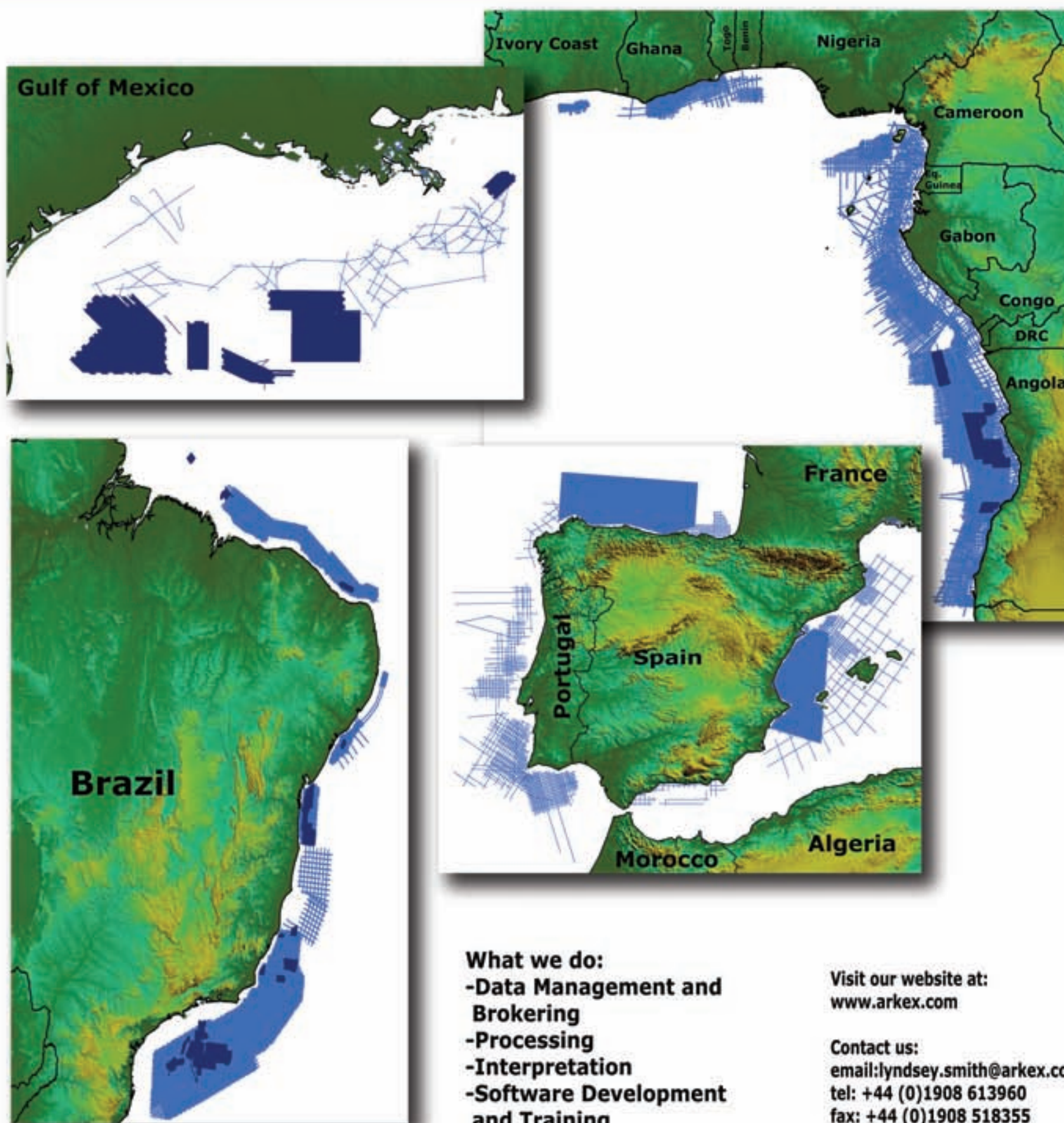
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Georges Bank holds promise**Basin Awaits Lifting of Moratorium**

By SUSAN R. EATON
EXPLORER Correspondent

Twenty years ago, AAPG member Tako Koning was the exploration manager for Texaco Canada Resources, and Texaco was poised to drill two exploratory wells on the Canadian side of Georges Bank, known as the East Georges Bank Basin.

The well locations were selected and the site specific geophysical surveys were completed when the Canadian and Nova Scotian governments jointly invoked a drilling moratorium – due to environmental issues – that would remain in effect until Dec. 31, 2012.

Koning has never forgotten this unexplored basin that got away – a basin that has remained in force majeure time warp with no industry activity for 20 years.

"I'm quite passionate about information sharing," Koning said, "and rather than letting that information die, I want to give back the East Georges Banks information (to industry, academia and to the public-at-large)."

Koning, who was part of the program advisory committee for a recent Halifax conjugate margins conference (see November 2008 EXPLORER), retired from ChevronTexaco in 2002 and now works in Angola as a consultant with Tullow Oil PLC.

The East Georges Bank Basin, however, still captivates his interest.

Koning presented a paper at the Halifax conference titled "Revisiting the East Georges Bank Basin, Offshore Nova



Koning

“When you put it all together – the seismic and the structures – this is the kind of basin that you’d drill anywhere in the world.”



Scotia – What the Explorationists Saw Two Decades Ago." He has presented this paper (with Texaco's approval) in various forms at international conferences nine times since 1988.

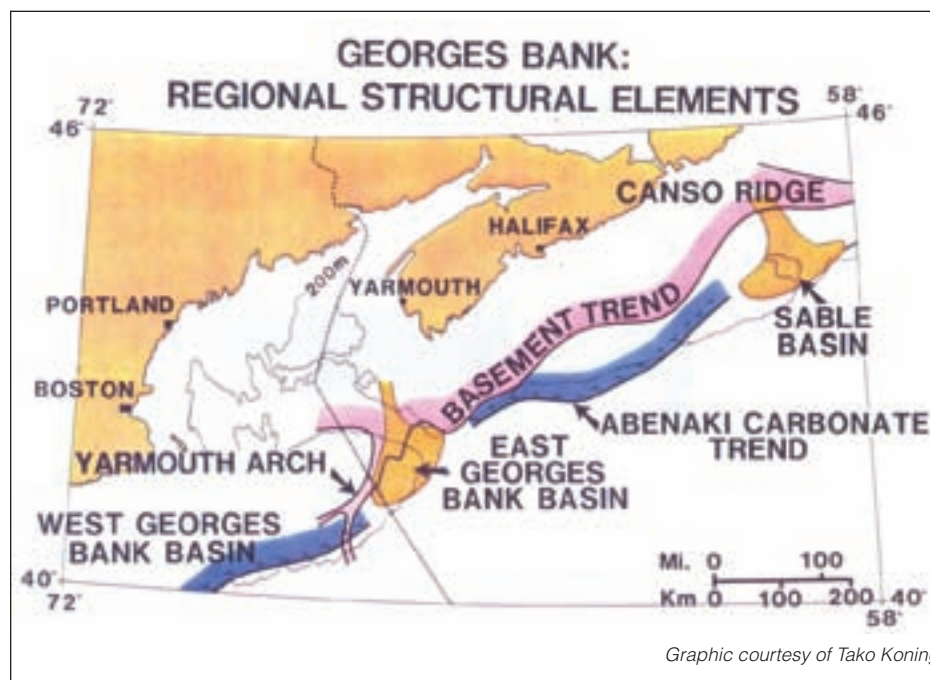
"There aren't many undrilled basins in the world – in such proximity to a large market – that have never been explored by a drill bit," Koning said of Texaco's lost opportunity.

"When you put it all together – the seismic and the structures – this is the kind of basin that you'd drill anywhere in the world."

Chances for Success

Koning assigned a 10 percent chance of success to the first series of exploratory wells that will test the play concepts developed in the 1980s by Texaco, based upon using the existing grid of vintage 2-D seismic data.

He acknowledged that the exploratory risks to success include the existence of source and reservoir rocks. These exploratory risks, however, may be



Graphic courtesy of Tako Koning

See **Georges Bank**, page 16



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WEEK 3	Open Hole Log Analysis (Practical Interpretation of Open Hole Logs)	March 23 - 27	September 8 - 11
WEEK 4	Overview of Seismic Exploration: Seismic Acquisition and Processing, AVO and Attributes and 2-D / 3-D Interpretation	March 30 - April 3	September 14 - 18
WEEK 5	Applied Subsurface Geological Mapping	April 6 - 9	September 21 - 25
WEEK 6	Seismic Interpretation Workshop	April 13 - 15	September 28 - 30
WEEK 6	Basic Reservoir Engineering for Non-Engineers	April 16 - 17	October 1 - 2
	PROJECT Schedule	SPRING	FALL
WEEK 7	Phase I: Initial Exploration - Delineate Prospects - Drill Exploration Wells	April 20 - 24	October 5 - 9
WEEK 8	Phase II: Assess Discovery - Refine Interpretation	April 27 - May 1	October 12 - 16
WEEK 9	Phase III-A: Field Development - Drill Development Wells	May 4 - 8	October 19 - 23
WEEK 10	Phase III-A: Field Development Continued	May 11 - 15	October 26 - 30
WEEK 11	Phase III-B: Explore for Additional Prospects	May 18 - 22	November 2 - 6
WEEK 12	Phase IV: Field Performance Analysis - Results of Other Exploration Prospects	May 26 - 27	November 9 - 11
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Neftex Regions showing current lines of chronostratigraphy (large panels 3' x 4')

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- *Global leads & prospects*
- *Global portfolio of play schematics*

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Photos courtesy of David E. Brown

Clues to offshore potential are typically found in scenic outcrops, such as this spectacular view of the famous Triassic-Jurassic boundary at Five Island, Nova Scotia, Canada (left), or the Middle Jurassic pinnacle reef comprising coralgall reef builders (right).

Georges Bank from page 14

reduced due to the existence of several new and significant discoveries in the adjacent Scotian Shelf, and technological breakthroughs in seismic data imaging, processing and mapping methods.

Georges Bank straddles the American-Canadian border. On the boundary's American side, the West Georges Bank Basin has been under drilling moratorium since 1982. However, given recent political events in Washington, the West Georges Bank Basin may be reopened for oil and gas exploration.

Prior to 1982 American companies drilled eight dry holes in the West Georges Bank Basin, a minimally deformed basin – these wells tested stratigraphic targets exhibiting high amplitude reflectors.

With the exception of one well, the wells failed to encounter source rocks, and were deemed to be “organically lean.”

“We (Texaco) never lost any sleep over those wells on the U.S. side,” Koning explained, “because there are two distinct sub-basins in Georges Banks.”

A prominent Paleozoic basement feature called the Yarmouth Arch separates the West and East Georges Bank basins.

The basin geometry – and the oil and gas potential, according to Koning – is distinctly different on the Canadian side, where there's a lot of structural “action” in the form of large, down-to-the-basement listric faults, salt diapiric structures and a significant reef trend that's correlated to the Late Jurassic age Abenaki hydrothermal dolomite reservoirs on the Scotian Shelf at Deep Panuke.

What's Next?

According to Koning, geological curiosity has inspired his 37-year-long career in the oil and gas industry.

In 1992 he attended an AAPG-sponsored geology field trip led by John Warme to the High Atlas Mountains of Morocco, to lay his hands on the prospective reservoirs in the conjugate margin – interpreted reef and clastic plays from 2-D seismic – of East Georges Bank Basin in outcrop. He saw spectacular outcrops of the equivalent rocks that Texaco's geophysicists had interpreted on the opposite side of the Atlantic Ocean, some 6,000 kilometers westward, offshore Nova Scotia.

In a 1983 report by the Geological Survey of Canada, the seismically defined prospects of the East Georges Bank Basin were estimated to contain mean recoverable gas reserves of 5.3 Tcf and 1.1 billion barrels of oil, with a high side figure of 10.8 Tcf and 2.1 billion barrels of oil.

Through historical mergers, the Texaco leases now belong to Chevron. In fact, almost close to 100 percent of the Canadian Georges Bank is currently held under exploration licenses that have remained in effect despite the force majeure conditions.

Koning is optimistic that the moratorium on Canada's Georges Bank will be rescinded in 2013.

“It will be up to the people of Nova Scotia and the politicians to decide if the potential of the East Georges Bank Basin will be evaluated,” he said.

“Certainly my view is that oil and gas activities and fishing can co-exist successfully, as we see in many parts of the world such as the North Sea, Gulf of Mexico and the Grand Banks of Newfoundland.” □

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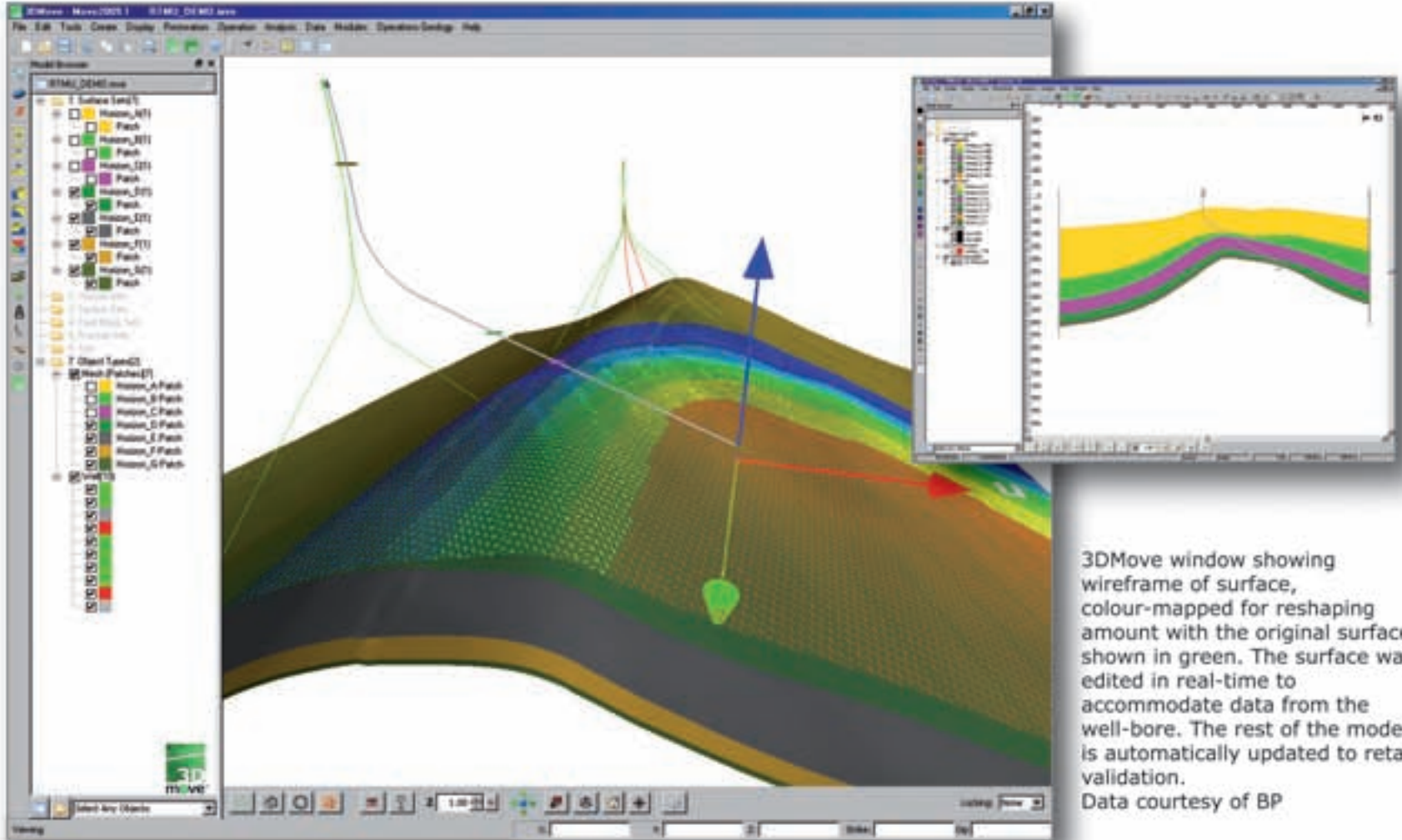
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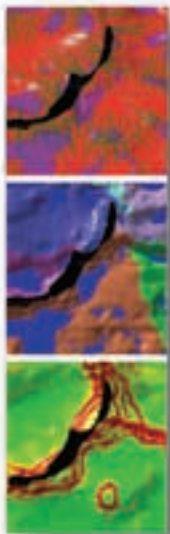


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3D Move window showing wireframe of surface, colour-mapped for reshaping amount with the original surface shown in green. The surface was edited in real-time to accommodate data from the well-bore. The rest of the model is automatically updated to retain validation.
Data courtesy of BP



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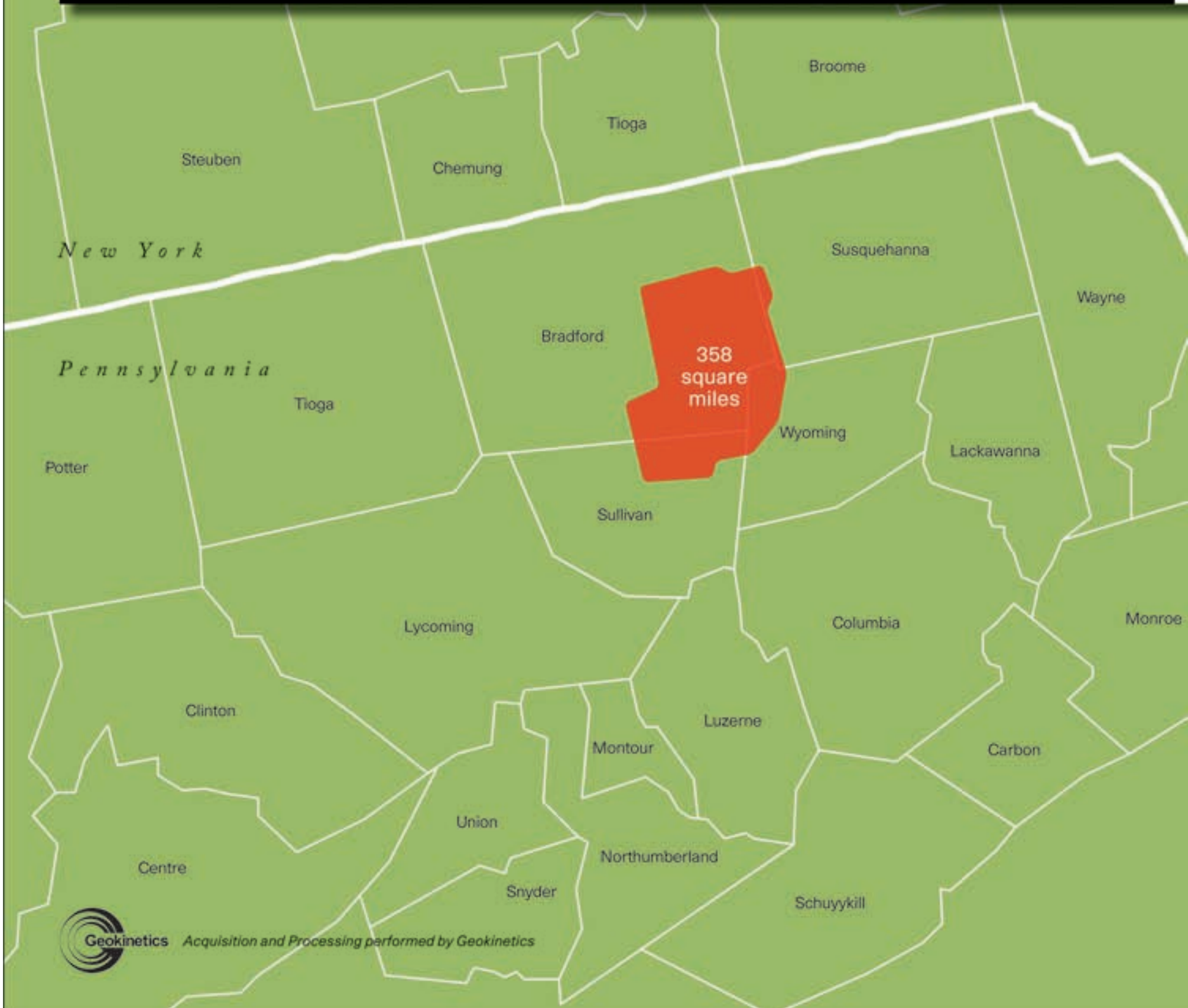


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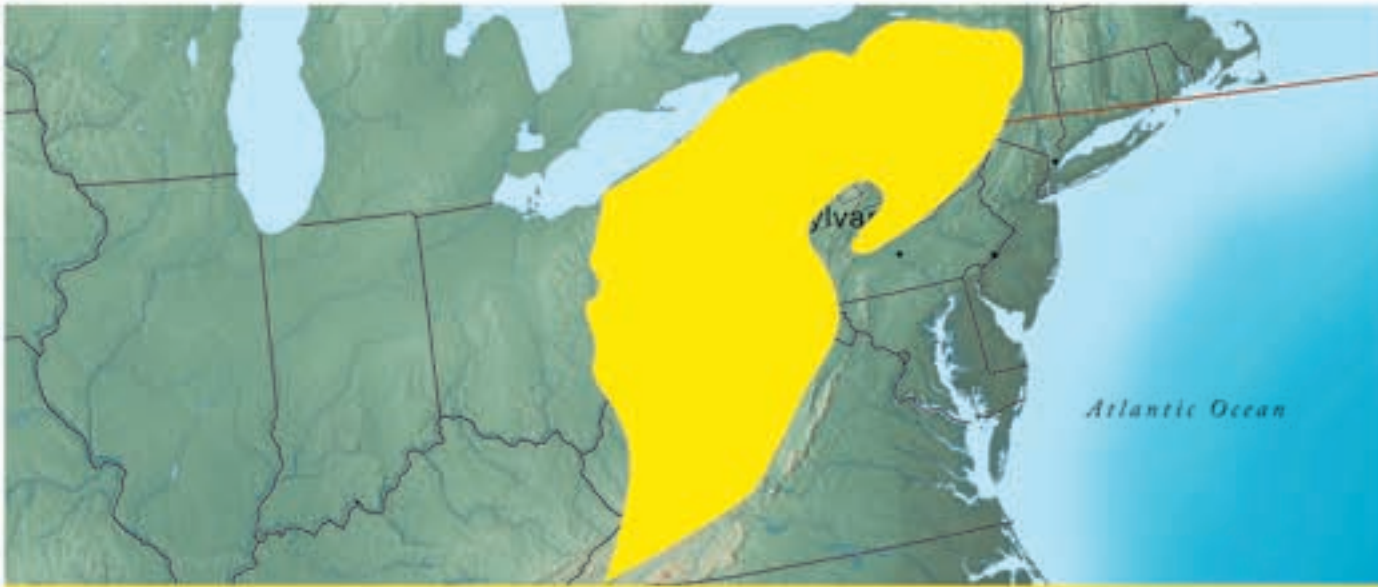


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A prelude to more deepwater prospects**Pre-Salt Has Brazil in Salsa Mood**

By LOUISE S. DURHAM
EXPLORER Correspondent

Commodity prices may have taken a nosedive, at least for the time being, but industry happenings offshore Brazil give reason for the locals – and plenty of other folks – to pop open the bubbly.

The top three field discoveries worldwide for 2008 – Iara, Jupiter and Guara – are all located offshore southeastern Brazil in the Santos Basin in the vicinity of other intriguing E&P real estate, e.g., the Campos and Espírito Santo basins.

(See related story, page 8.)

Santos is the locale of the much-publicized Tupi Field discovery announced in 2007 by Brazil's state-owned Petrobras. Petrobras' partners in the field include Britain's BG Group and Portugal's Galp Energy.

Tupi is estimated to harbor eight billion barrels of recoverable reserves and represents the largest find since the 13-billion-barrel Kashagan Field in Kazakhstan was discovered in 2000. Kashagan, in turn, was the largest field discovery since Prudhoe Bay in Alaska more than 30 years ago.

The Streak Continues

The Santos Basin is proving to be a motherlode of big fields, yet it will be a major challenge to comprehensively evaluate and ultimately produce the hydrocarbons.

This is a deepwater subsalt environment.

Tupi, for instance, was drilled in about



7,000 feet of water, and the field resides another 17,000 feet subsea under a massive salt sheet, which is known to wreak havoc with seismic imaging quality using traditional technology. Extreme pressures and temperatures can be daunting for the drillers.

The good news is that the subsalt crude is generally high quality, i.e., about 30 degrees API, as opposed to Brazil's usually heavy oil, which averages about 21 degrees, according to AAPG member Bob Fryklund, vice president at Houston-

based IHS Energy. The light oil needs less processing and therefore is less expensive to produce.

The Iara discovery in August could hold between three and four billion barrels of oil and is on the same BM-S-11 block as Tupi. In fact, Iara is more than three times as big as anticipated, according to BG Group, which holds seven licenses with partners in the Santos Basin. All of the consortia include Petrobras.

Iara was the sixth consecutive drilling

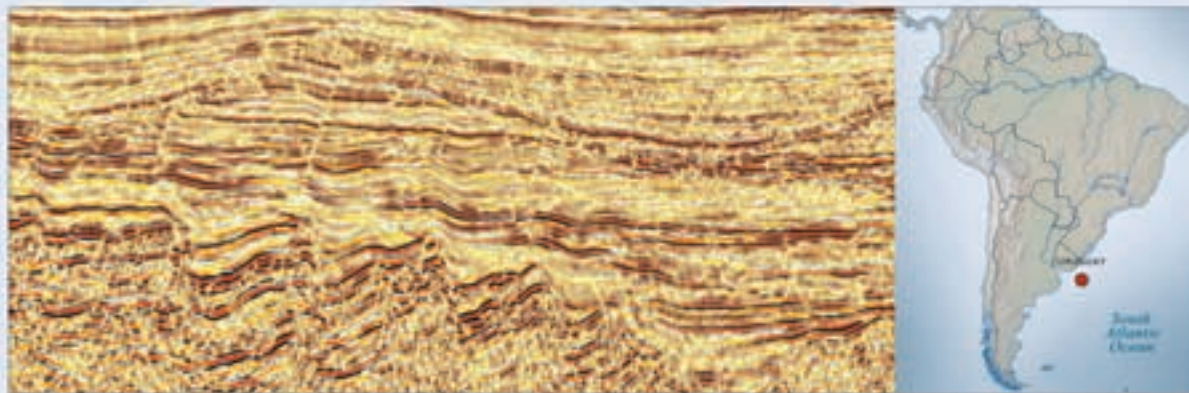


success in this deepwater sub-salt basin since the state-owned oil company and its partners began their drilling program in 2005, according to Petrobras.

Jupiter's Potential

The Jupiter well drilled by Petrobras east of Tupi in Block BM-S-24 confirmed the existence of a large natural gas and

See **Brazil**, page 22

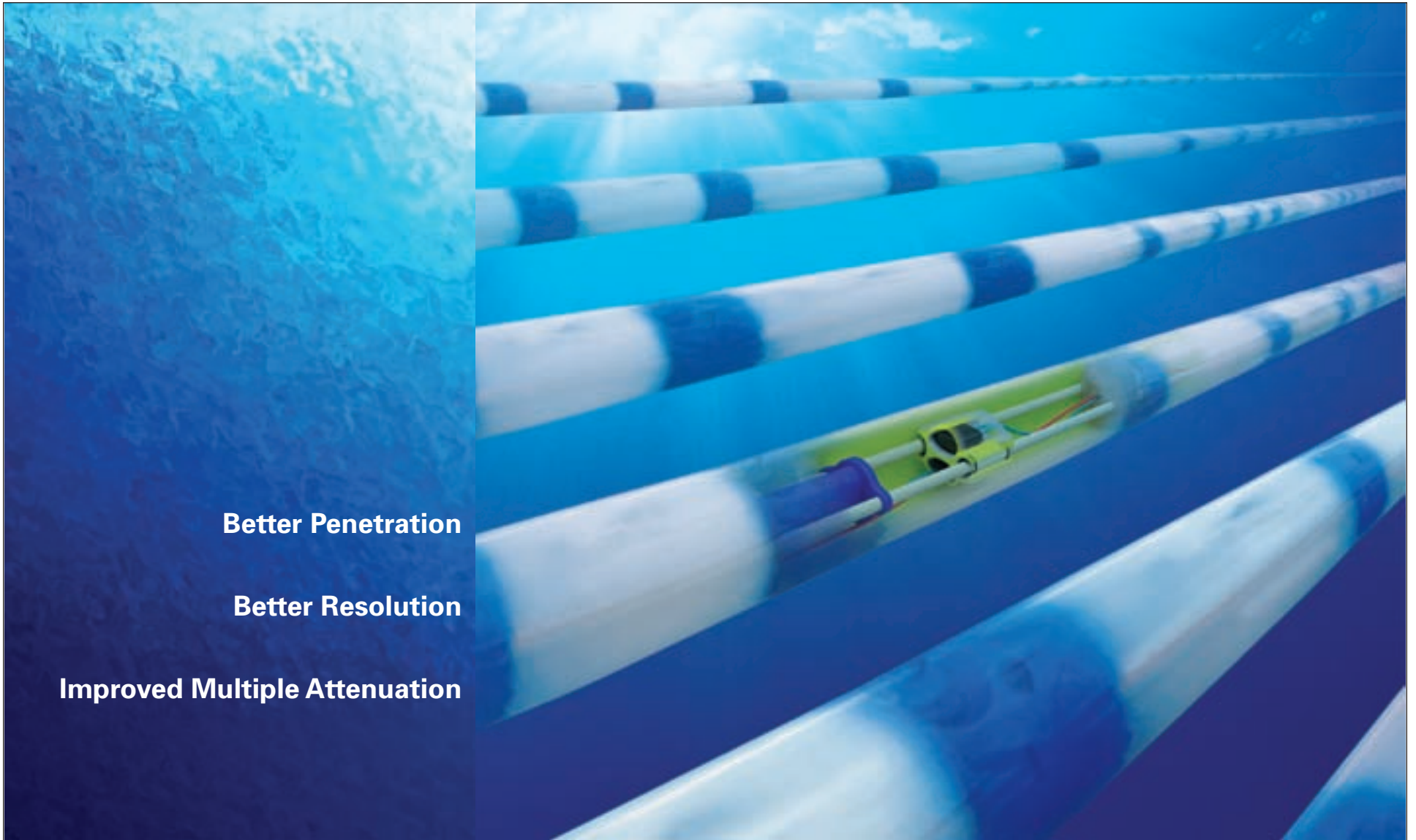
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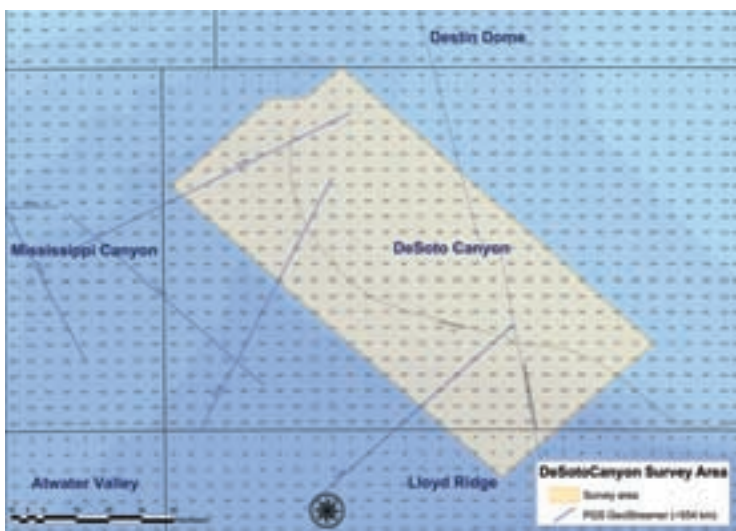
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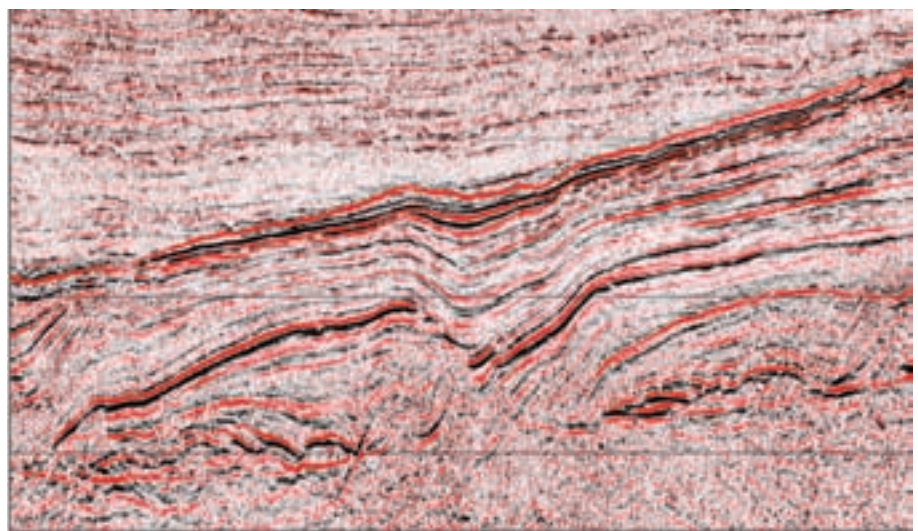
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Structure World

Welcome to the first edition of Structure World of 2009. We would like to wish you all a happy new year and best of luck in the year ahead.

This month we announce details of our Structural Geology conference in September; highlight the new features in the latest Move2009 software release; and our interpreters tip looks at Inversion of Extensional Faults.

1st Announcement and Call for Papers: Structural Geology in Uncertain Times. Abstract deadline 30th April 2009.

Following our hugely successful 25th Anniversary Technology meeting, we have had many requests to make this an annual event.



As a result we would like to announce our "Structural Geology in Uncertain Times" conference taking place in Glasgow (UK) on 15th - 16th September 2009.

Papers from all areas of structural geology are welcomed.

Information on both the previous event and the upcoming event can be found on our website www.mve.com or by emailing events@mve.com.

We hope to see you there!

Student Structural Prize

The closing date for our annual competition to find the best student structural geology paper or project of 2008 is coming up at the end of this month (30th January). Make sure your entry is in!

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Move2009 - The next step forward...



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Public Training Event - February 2009

Our first Public Training event of 2009 will take place in our Glasgow HQ on 2nd - 4th February, titled "Structural Modelling using Move". If you would like to attend this 3-day course or would like further information email events@mve.com.

Interpreters Tip - Inversion of Extensional Faults - what to look out for on a dip section

For the purposes of this interpreters tip, the definition of Inversion is 'the reactivation of an extensional fault in the opposite direction to its original movement due to contractional tectonics'. Inversion has at least a three stage structural-sedimentary signature, pre-tectonic and syn-tectonic including extension and contraction. The presence of these three tectonic units within the section is really the key to identifying whether you have inversion. The pre-tectonic unit is likely to be layer parallel, the extensional phase is likely to show growth stratigraphy thickening into the fault zone and the inversion units may be discontinuous, varying in thickness laterally and overlapping/thinning onto a growing topographic high near to the fault. The relative rate of fault movement v. sedimentation will have a dramatic effect on the actual geometric manifestation of the tectonic units. There are a number of other geometric indicators which, together with the tectonic units described are common to inversion such as: higher angle breakthrough faulting, a footwall pull-up artifact on seismic images due to inversion of higher velocity units on to lower velocity units, erosion of the topographic high, growth stratigraphy at or above regional. It is unlikely that all these indicators will be identifiable however, when interpreting a section which shows a number of these indicators, then inversion should be considered as a possibility. The key, is to think about the timing/kinematic history of the tectonic sequence and the previously mentioned three tectonic units.

Kinematic analysis using Move software (see images below), enables you to take the sequence back through the individual tectonic time steps and gain a better understanding of the relationship between faulting, folding and sedimentation.

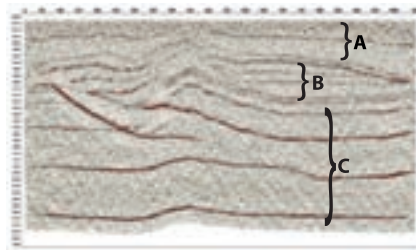
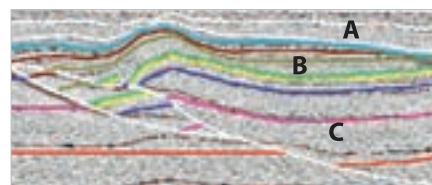


Figure 1: Seismic profile (time) of inversion. Note the 3 units in 2DMove, A. Syntectonic - Inversion; B. Syntectonic - Extension; C. Pre-tectonic.



Seismic profile (time) with interpretation overlain in 2DMove., A. Return to regional; B. Breakthrough faulting; C. Footwall pull up. Note certain additional indicators, try and identify them on the seismic profile above.

Brazil

from page 20

light-oil sub-salt field.

The Jupiter reservoir has a higher CO₂ content than expected, according to Galp, which holds a 20 percent stake in the block. The company noted this gas will be re-injected to improve the recovery factor.

Regarding the size of Jupiter, Petrobras reported the structure's dimensions could be similar to Tupi.

The Guara discovery well drilled by Petrobras with partners BG and Repsol in the BM-S-9 concession area is also set to figure prominently in extending the potential of this significant hydrocarbon province. The well is in the same block as the Carioca discovery that reportedly may contain as much as 33 MMbo. In fact, Guara and Carioca conceivably could be the same structure.

A comment by BG chief executive Frank Chapman suggests discoveries reported thus far in the Santos Basin could be only a prelude to what's to come.

"There remain in BG Group's portfolio a number of significant untested exploration prospects in the Santos pre-salt play," Chapman said, "as well as potential upside from appraisal of existing discoveries."

An Expensive Proposition

It's been said this entire region could contain a humongous 70 Bboe – but don't look for production to come online with any sense of speed.

A couple of months ago, the BG Group stated that output from Tupi, Guara and Lara should hit 300,000 boe/d by 2012.

However, the impact of the ongoing near-breathtaking decline in oil prices along with cratering demand worldwide remains to be seen. Earlier-established timetables for E&P projects far and wide are being altered these days.

Santos Basin sub-salt wells will not only be tough drilling, they're expensive – and the end product needs a market.

Fryklund said the initial well at Tupi cost about \$240 million and required a year to drill – not an appealing scenario if commodity prices are in the tank.

Still, development of such enormous reserves is a forward-looking endeavor, and if anyone can make it work, it should be Petrobras. Fryklund noted the company historically has done most of the deepwater drilling in this entire region as compared to the Gulf of Mexico where several companies are experienced in the deepwater, including the subsalt environment.

There appears to be no lack of confidence that the play will progress given that Petrobras is poised to invest \$400 billion over the next 10 years to develop its new offshore fields, according to the National Petroleum Agency.

There also is a growing number of outsiders knocking on the door with huge sums of money to contribute in return for a piece of the action.

China, for instance, reportedly wants to chip in \$10 billion to help develop the new deepwater finds. Even the United Arab Emirates are said to want to establish a presence in the play.

In the past, these financial dealings might not have been an option as Petrobras wouldn't have been interested in money – but that's changed in today's

There appears to be no lack of confidence that the play will progress given that Petrobras is poised to invest \$400 billion over the next 10 years to develop its new fields.

playing field, Fryklund noted.

"With the huge success and potential (of these discoveries), they do need help," he said. "With the credit markets the way they are, they need to look for alternate financing, so the Chinese and other NOCs with lots of cash can come in through that back door."

This is a far cry from chasing money "hat in hand," which is rapidly becoming a kind of lifestyle for companies of various kinds these days.

"These huge finds are a good reason to need money," Fryklund emphasized.

It is noteworthy that U.S.-based companies also are playing a role in Brazil's deepwater subsalt action.

A recent Anadarko-operated discovery well in the Campos Basin included Devon and other partners, and Fryklund noted ExxonMobil is drilling a well in the Santos Basin that currently is designated a tight-hole. Hess also has interests in the play. □

S&D Adds Articles

It was a very good year, indeed.

Thanks to contributors from around the world, *Search and Discovery*, AAPG's free electronic journal, posted a record 366 articles during 2008.

And the coming year may be even bigger.

Already, permission requests have been sent to more than 300 oral presenters from the recent AAPG International Convention and Exposition held in Cape Town, South Africa. Work also continues on 2008 poster sessions from the AAPG Annual Convention and Exhibition held in San Antonio.

A sampling of articles demonstrating diversity of subject matter published during November

include:

✓ **Reducing the Structural Uncertainty in Poor 2-D Seismic Data, Gambier Embayment, Otway Basin, Australia – A Minimum Strain Approach**, by Peter Boulton, Brett Freeman and Graham Yielding.

✓ **Unconventional Seismic – Hazard Mapping for Shale Gas Plays**, by Larry Lunardi.

✓ **Understanding Deepwater Architecture from Process Interpretation at Outcrop: An (Ancient to Modern)? Perspective**, by Ole J. Martinsen and John B. Thurmond.

✓ **Applications of Sedimentary Record of Astronomically Driven Paleoclimate Oscillations and Trends**, by Linda A. Hinnov and James G. Ogg.



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*Industry appears to be banking on rebound***Most Companies Still in Hiring Mood**

By DAVID BROWN
EXPLORER Correspondent

Oh ... My ... Gosh!
Everybody panic!!!

The world economy is in a mess and oil prices have dropped more than \$100 a barrel – \$100, can you believe it?! – and jobs are disappearing everywhere.

Houston economist Barton Smith said that city alone could lose 37,500 jobs.

But if oil and gas prices fall even further the job losses will be worse, said Smith, director of the University of Houston's Institute for Regional Forecasting.

And some predictions say oil prices will fall another 40 percent!

It's the end of the world!!!

Okay – now everybody calm down.

Take a deep breath and think about this:

From a hiring standpoint, the industry is actually better off today.

For the past year oil companies have been scrambling to find new technical hires, without much luck.

With oil prices over \$100 a barrel, the industry was running out of recruits.

There just weren't enough experienced, capable people to fill the hiring need.

"For the most part, what I've heard out of companies is that they're already running so lean they can't afford to lay anybody off," said Mike Ayling of MLA Resources in Tulsa.

Ayling has provided industry and employment data to AAPG and the

The AAPG Career Center, launched in July, is getting a lot of attention. The center is an online service for job seekers and employers within the industry who are looking for manpower opportunities, and includes a resume-posting service.

As of early December there were six searchable jobs posted, 318 searchable resumes and 77 registered employers.

EXPLORER for nearly 25 years, including the annual salary survey.

His view of today's industry: We've gone from a situation with a huge deficit of technical professionals to one where expertise and job openings are more in balance.

"What I have seen, and it's really varied, is that a couple of companies have told me they wouldn't be hiring until after the first of the year," Ayling said.

"Out of all my clients, only one company said they aren't hiring any technical people right now," he added.

Wanted: More

And it's not just a matter of positions open today.

An entire generation of oil company technical staff is getting ready to retire.

"The other problem the industry has – and we've talked about this for years – is the demographic problem," Ayling noted.

"Probably 60 percent of the technical people within the industry right now are within 15 years of retirement. And that may be low – it may be within 10 years,"

Included in the Career Center is a Member Registry, where AAPG members record their areas of professional expertise and the years of experience within them, enabling companies and members to search for other members with similar experience and interests.

See the Career Center at www.aapg.org. □

he said. "That means there's a huge void at the bottom that has to be filled."

With extremely high oil and gas prices, the industry was struggling to find or train qualified personnel for current openings.

There was no way to cope with a tidal wave of retirements that will produce thousands and thousands of additional job openings.

Not to mention the competition for expertise and experience. E&P technical professionals were in short supply last August, and they will be in short supply next August.

"I would be shocked if companies are so foolish as to let many people go into the marketplace," Ayling said.

Demand and Supply

So far, recruiters are backing up that viewpoint.

"Drilling has slowed down but G&G – the geologists and geophysicists, geoscience professionals – is in quite high demand," said Anna Shchelokova, senior HR consultant for



Ayling

Worldwideworker.com in Houston.

"I don't see any problems in the U.S.," she added.

Worldwideworker calls itself the "world experts in energy jobs." Shchelokova said energy-

employment demand is holding steady in North and South America and Africa, off a little for Europe, Asia and the Middle East.

Drilling engineers and reservoir engineers also continue to be in demand, she said.

"People probably won't get the job of their dreams right now, but they will definitely get something," Shchelokova noted.

Ayling said the momentum built up by the industry and its need to continue ongoing projects is helping maintain the steady employment demand.

"Some companies have postponed some discretionary things, but a lot of what they're doing isn't discretionary," he observed.

That leaves many oil companies in a hiring mood. The direction of near-term bounces in oil and gas prices, up or down, is anybody's guess.

Longer term, after prices bottom out, the industry appears to be banking on a robust rebound.

"What I expect you'll see," Ayling said, "is a slow, gradual recovery over the next six months." □



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*The 'big crew change'***Actions Tried to Get, Keep Talent**

By LARRY NATION

AAPG Communications Director

Manpower. It's been a concern for two decades and remains a challenge that gets more critical with no magic bullet in sight.

But a panel of executive-level experts noted in a special session at the recent AAPG International Convention and Exhibition in Cape Town there are strategies being undertaken – and still to be launched – that can have an impact.

The panel, co-chaired by **Pete Stark**, IHS vice president of industry relations, and **Michael Naylor**, vice president technical, global exploration, Shell, included:

□ **Mario Carminatti**, Petrobras executive manager for exploration.

□ **Christian J. Heine**, Saudi Aramco senior geological consultant.

□ **Rod Nelson**, Schlumberger vice president of innovations and collaboration.

□ **Jatinda Peters**, manager of administration and HR for the India's Oil and Natural Gas Corp.

□ **Scott Tinker**, AAPG president.

The panel agreed with Nelson that the industry experienced a hiring surge in the late 1970s and early '80s, followed by an extended period of decline resulting in the peak evident in this age distribution.

A recent influx of new talent has not made up for decades of depressed hiring activity. As a result, over half of today's work force is eligible for retirement within the next 10 years – an anticipated event often referred to as "the big crew change."



The work force must be replenished, but this challenge is exacerbated by an overall shortage of science and engineering graduates – particularly women and minorities.

But that's not necessarily the only difficulty.

Challenges and Strategies

Peters noted the irony of populous regions such as India still facing a shortage of manpower.

"Employability is the issue," Peters said, also noting skills are needed in addition to technical expertise, including

good communication skills and cultural, social and religious sensitivities and adaptability.

She also noted the "huge mismatch" between the skill set needs of industry and output of the universities.

Also, national oil companies are putting a premium – and in many cases, requiring – for only nationals to populate salaried positions.

Additional challenges include the industry's image and competition from other industries.

Tinker noted that global demographics are evolving with the realities including a younger population in developing

countries, differing expectations of the new generation and particular needs for females to be attracted to – and retained by – the industry.

He noted that complex global issues pose technical and social challenges, and a volatile price environment requires an integrated, cooperative approach by industry, government and academe.

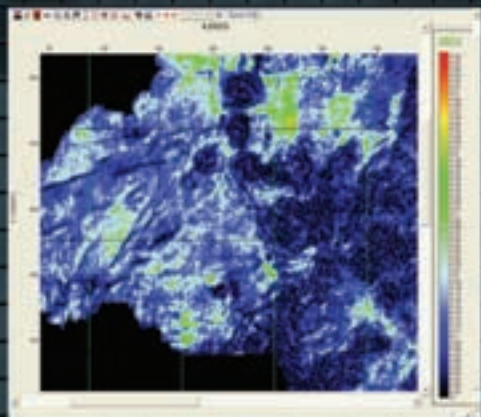
Tinker also noted that science, policy and commercialization are critical partners for the future, and that each sector has different time scales for decision-making and are motivated for different opportunities.

"We must bridge across the cycles in order to create a stable environment that attracts and retains the best talent in the world," Tinker said.

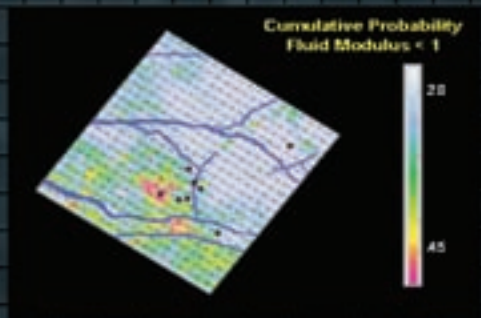
Presenters shared strategies that included:

- ✓ Higher levels of engagement of our industry with schools.
- ✓ Providing materials/programs to enhance curricula.
- ✓ More scholarships.
- ✓ Flexible approaches for work-life balances, including work-at-home opportunities.
- ✓ Sabbaticals.
- ✓ Better defined career ladders.
- ✓ Various mentoring programs, including tapping the talents of qualified retirees.
- ✓ Structured professional and personal development programs.

Visual aids presented in the workshop are available in the Careers area of the AAPG Web site. □



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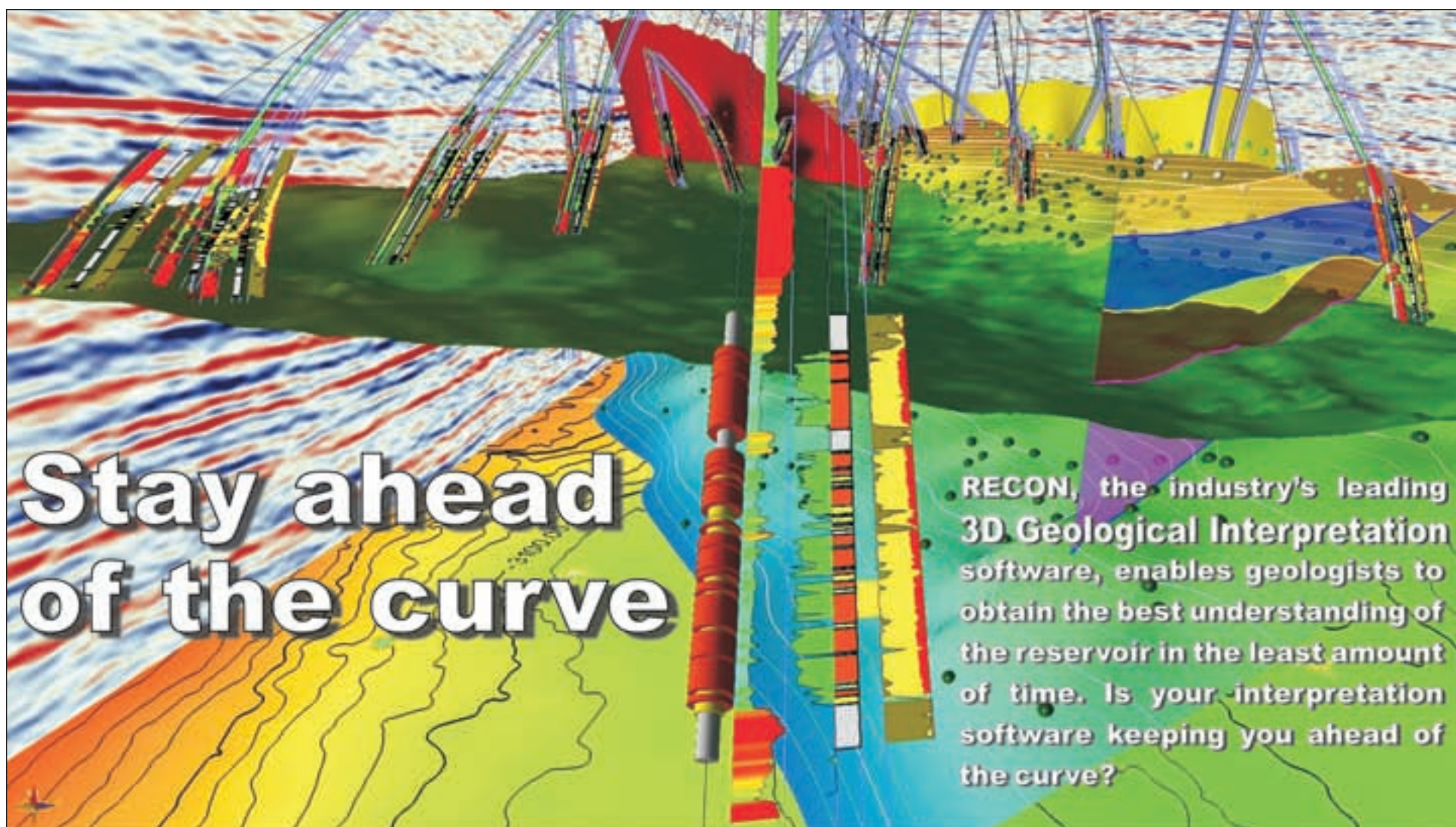
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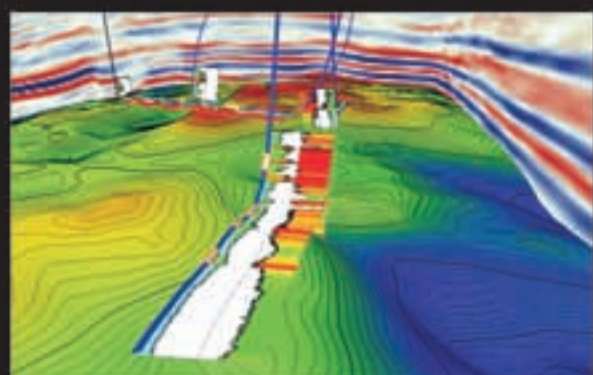
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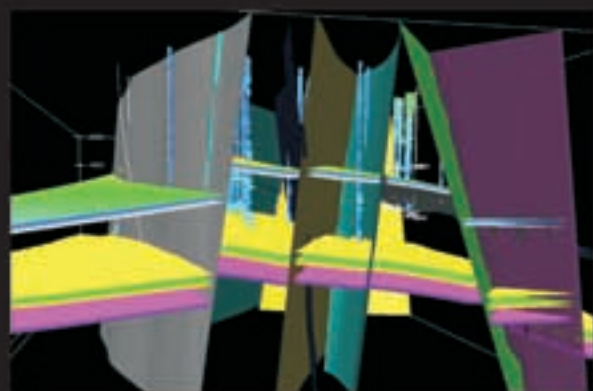
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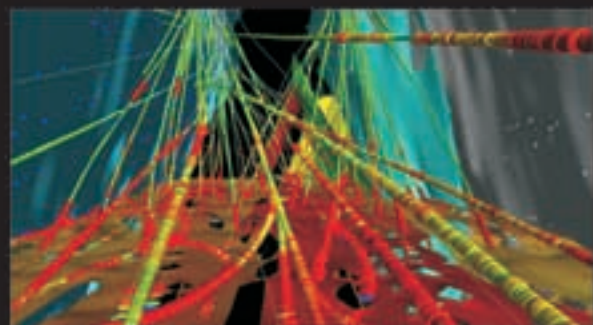
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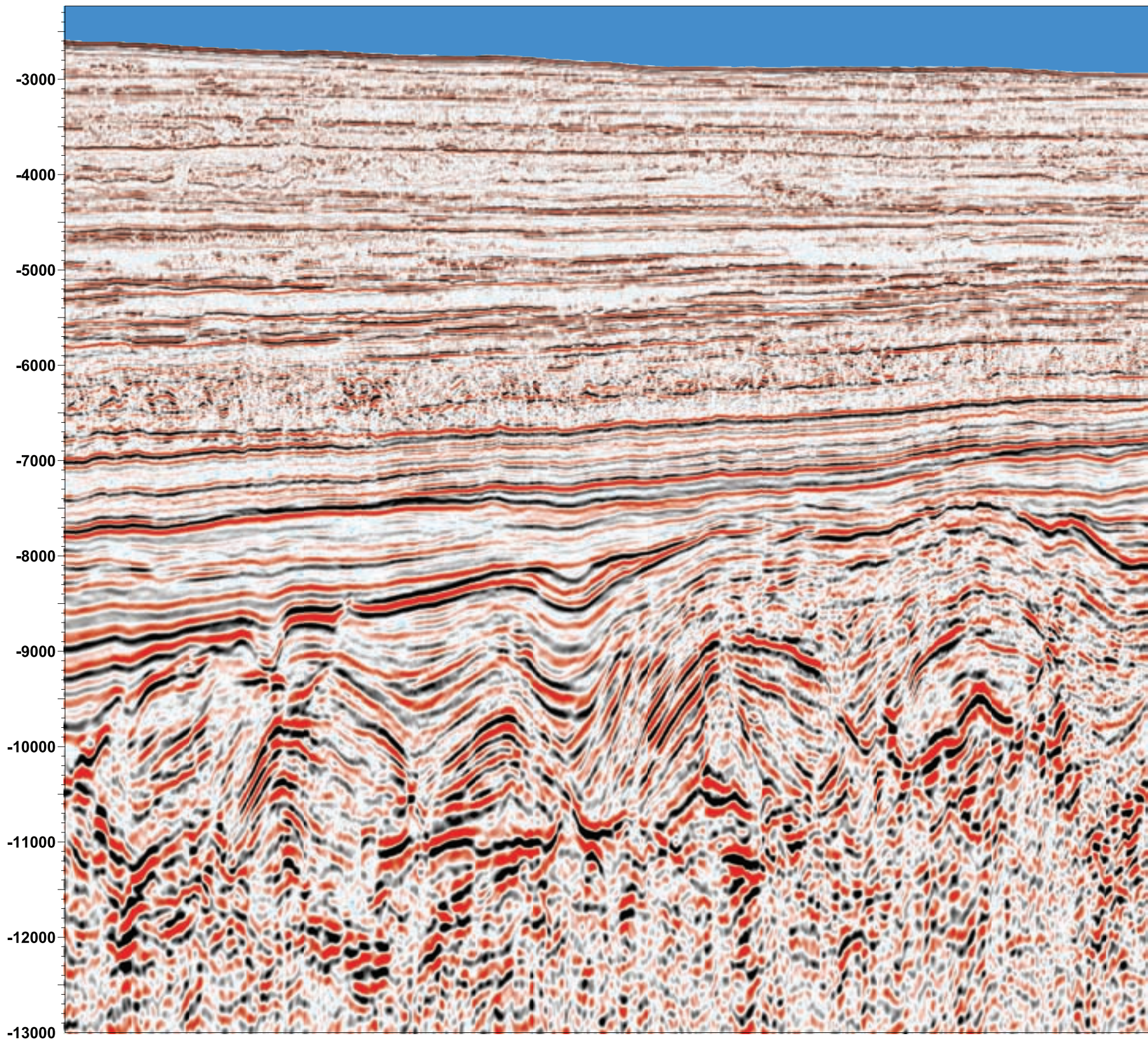
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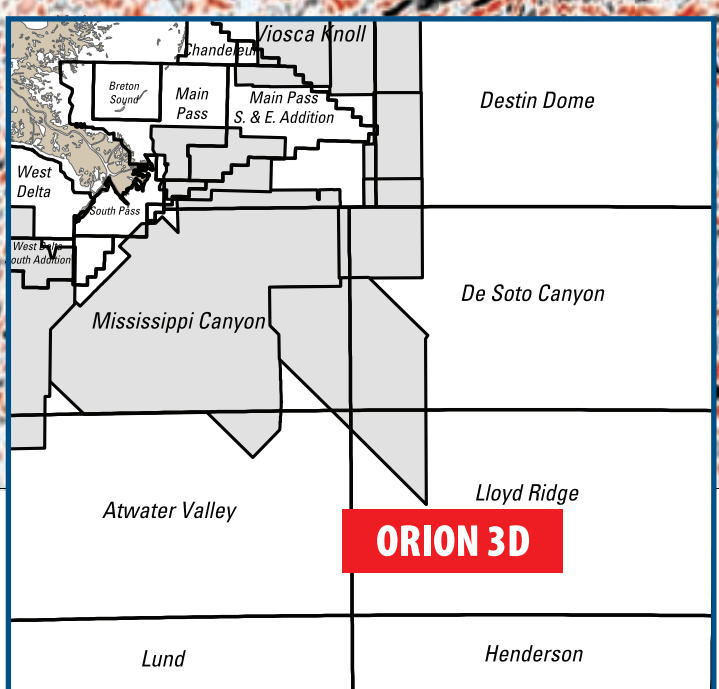
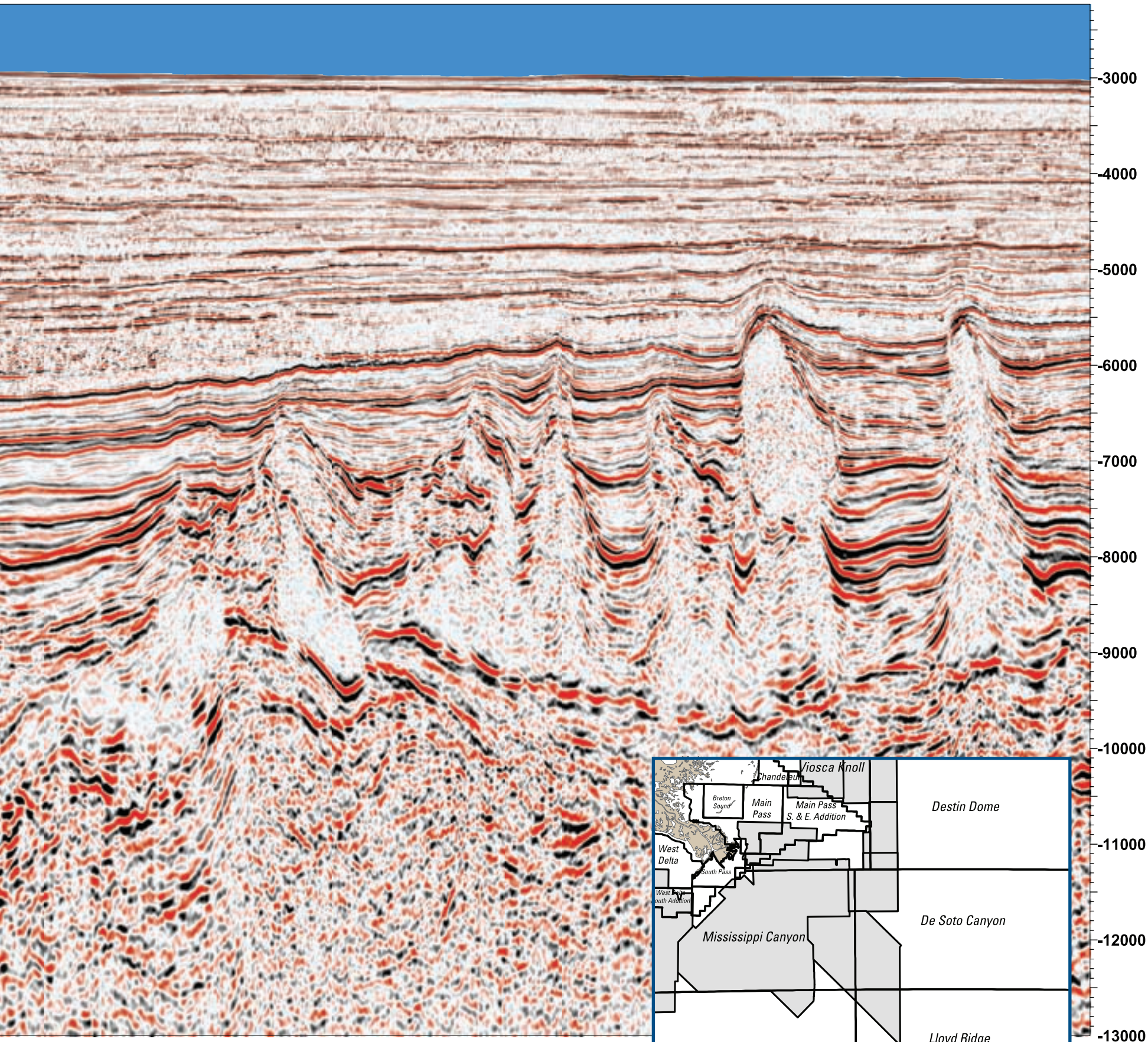


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Communication, flexibility offer solutions**Women Find Their Place in Industry**

By LOUISE S. DURHAM
EXPLORER Correspondent

Despite plummeting commodity prices, oil and gas companies in general have indicated they'll keep going after new-hires to beef up lean staffs – a hangover-type situation caused in part by the massive layoffs during previous downturns in the industry.

The ongoing need for skilled, qualified people appears to be altering the makeup of the traditionally male-dominated industry – slowly but surely.

The fourth annual Women's Global Leadership Conference (WGLC) left no doubt that professional women are finding a place in the business – and making their presence known.

Nearly 1,000 businesswomen, executives and industry leaders from top energy companies worldwide assembled at the November confab in Houston, according to Maggie Seeliger, vice-president for strategic business development at event-host Gulf Publishing Co.

Seeliger noted the annual event provides a forum for women in the energy industry to discuss key business and economic issues and gather insight from world leaders in energy, government, politics and academia. Discussions focused on issues ranging from responsible stewardship to professional development strategies.

Topics discussed included:

- ✓ Alternative energy.
- ✓ Global energy marketplace.
- ✓ Wall Street and the industry.

✓ Demand for energy versus the environment.

Let's Talk Sex

The dearth of new talent coming into the business has been the source of much angst industry-wide as many of the remaining longtime stalwarts continue to opt for retirement or other pursuits.

It's perhaps more urgent than ever to convince women they can play a vital role in the energy business.

"The grand challenge is not energy supply but where will the talent come from that is required to develop today's fossil energy so we can afford to transition to tomorrow's energy alternatives," said Scott Tinker, president of AAPG, which participated as an event sponsor.

Tinker – who is director of the Bureau of Economic Geology, State Geologist of Texas and the Edwin Allday Chair of Subsurface Geology at the University of Texas at Austin – was a keynote speaker at the WGLC event.

"I'm convinced that the opportunities and challenges in energy are of such significance that it requires both genders

working together," Tinker said, "to bring our own strengths and unique talents to bear to solve the issues that face the planet."

"What worries me is we have over 50 percent women in our undergraduate school majoring in geology/geosciences," Tinker noted, "and it starts to decline through graduate school and then through years in industry to the point where it's 10 to 15 percent.

"I know we're losing good technical people and managers," he said, "and that's not acceptable.

"Still, I've seen examples of really great change and improvement," Tinker added. "It varies by company, sometimes by country."

No doubt there are many variables impacting the still-low numbers of women in the industry. Tinker appeared to cut to the chase when he noted "two of the greatest impediments to reasonable parity between men and women are, in no particular order, men and women.

"As I gather data and experiment with various employment models," he said, "I have found that solutions can be best summed up in two words: communication and flexibility."



Tinker was a keynote speaker at the recent Women's Global Leadership Conference in Houston.

Survey Results

Companies increasingly are allowing flexible work schedules to accommodate various situations, e.g., dual career couples with small offspring to care for, spousal transfer situations where the "trailing" spouse is allowed to continue work from out-of-state, etc., etc.

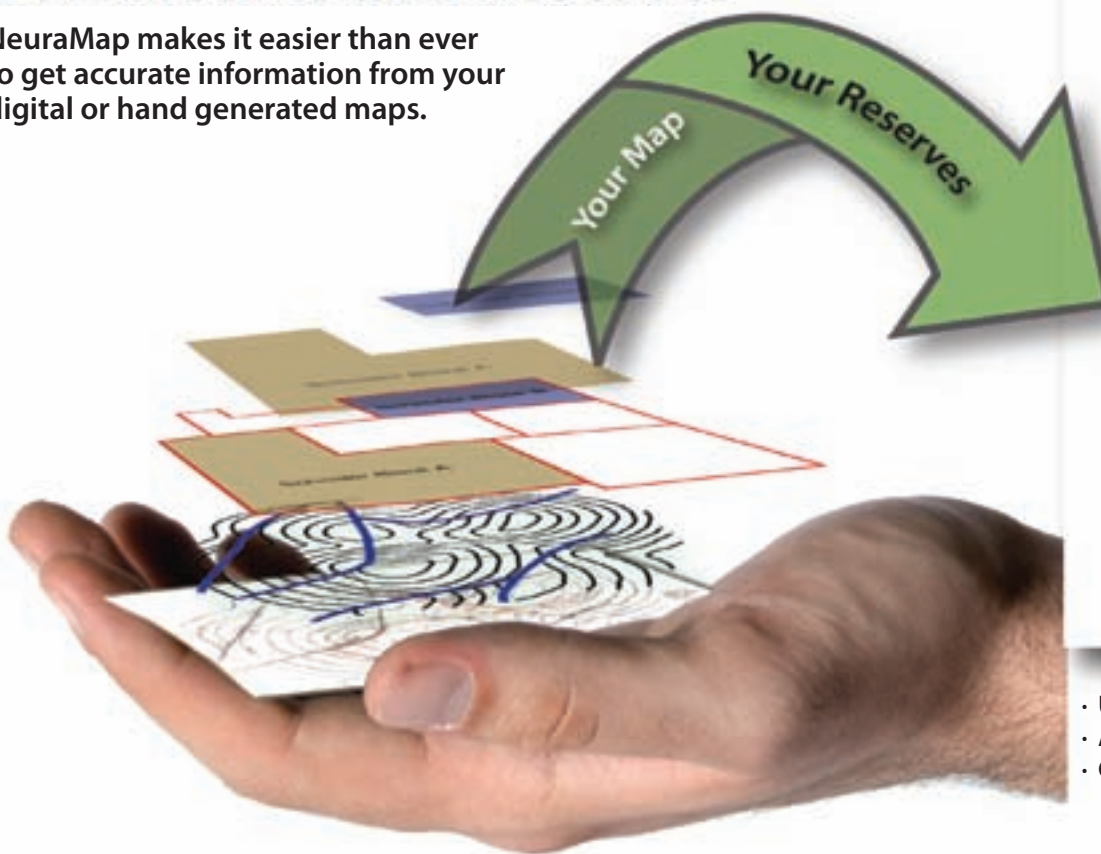
Still flexibility must be managed with care lest flexibility dysfunction set in where the situation is so flexible the job does not get done.

Two surveys were conducted in conjunction with the WGLC to gather data on professional development

See **WGLC**, page 32

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Ceiling Created Independent Path

Professional women are no longer the rarity they once were at the E&P companies.

Still, they don't necessarily settle in for the long haul.

Like their predecessors who jumped into the fray 20 or more years ago, there continues to be a smattering of smart, savvy women in the E&P corporate milieu who ultimately decide the glass ceiling hovering over their collective heads just isn't to their liking.

So they opt to bail out – but not necessarily out of the oil and gas business.

Armed with considerable acquired industry skills, a number of these independent-oriented folks strike out to

make it on their own in whatever industry-related niche they determine best suits their talent, abilities and interests.

This was the case with Sara Akbar, CEO of Kuwait Energy Company, who presented the closing keynote speech at the recent Women's Global Leadership Conference in Houston.

Prior to founding Kuwait Energy in 2005, Akbar held myriad high-level, challenging positions for 18 years at Kuwait Oil Company, followed by close to five years at Kuwait Foreign Petroleum Exploration Co.

Despite her many successes at these two companies, Akbar encountered various roadblocks/frustrations along the



Akbar

"I needed huge capital but did it in sequences," she said. "It's worth \$750 million today, so it's been profitable and rewarding.

"The focus is all on exploration," Akbar noted, "and it's one of the few

way, ultimately choosing to journey forth on what she viewed as a better path.

"I thought, do I have to live with a glass ceiling – and the answer was no," Akbar said. "So I created my own company.

successful independent E&P companies operating from the Middle East."

The entrepreneurial Akbar postponed marriage and children until she was well along in her career. And when it comes to child care concerns and work-life balance that are weighty issues in today's workplace, Akbar's situation is to be envied by her Western counterparts.

"In my part of the world, we have extended families," she said. "I live with my three brothers and their families, and my husband has been retired for seven years and also helps to look after the children – and there's also cheap labor like maids, cooks, nannies."

– LOUISE S. DURHAM



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WGLC

from page 30

obstacles facing women in the industry.

Gulf Research implemented a Web survey of female executives in the oil patch. Detailed, open-ended responses were received from 12 qualified participants with five to 25 years of industry experience. The respondents held titles that included CFO, senior marketing manager, regulatory affairs manager, human resources manager, director, geologist and production engineer.

Seeligson noted the small sample was intended to provide insight and not generalizations and projections for all female executives.

Results from the focus survey included:

- ✓ Creating and promoting an environment that is aligned with women's needs will facilitate recruitment and retention in the energy industry.
- ✓ Both business savvy and interpersonal skills are necessary to be successful in the energy industry.
- ✓ Overcoming gender bias and balancing family are common obstacles women face.
- ✓ Despite progress, respondents believe that a glass ceiling still restricts them from advancement in the industry.
- ✓ Some respondents are happy with their career path, while others believe they had to choose between family and advancement.

The second survey, powered by WHAMmobile, requested conference attendees to answer five questions using mobile texting. Key results included:

- ✓ 57 percent of respondents were interested in staying in the energy industry for their entire careers.
- ✓ 30 percent have worked in the energy industry less than two years.
- ✓ 91 percent said they face more career growth obstacles than men in the energy industry.
- ✓ 86 percent said access to networking opportunities for women has improved over the last five years.
- ✓ 35 percent said their company doesn't provide enough opportunity for women to grow in their careers.

Tinker noted that AAPG's committee on Promoting Professional Women in Earth Sciences recently conducted a work force retention survey. Preliminary and incomplete findings were included in the December EXPLORER; final analyzed results also will be published in the EXPLORER and on the AAPG Web site. □

PROFESSIONALnewsbriefs

Randy J. Bruner, to director of exploration and production, Layton Energy, Houston. Previously geoscience consultant, Marathon Oil, Houston.

Phillip E. Byrd, to staff geologist, Questar Exploration and Production, Tulsa. Previously senior geologist, PetroQuest Energy, Tulsa.

Carlos Enrique Cruz, to geosciences manager, ArPetro Argentina S.A., Buenos Aires, Argentina. Previously Africa project G&G leader, Pluspetrol S.A., Buenos Aires, Argentina.

Dale Fritz, to geological manager-north Fort Worth Basin, Devon Energy, Oklahoma City. Previously district geological supervisor-midcontinent, Devon Energy, Oklahoma City.

Kosit Fuangswasdi, to vice president-exploration and production, P3 Global Energy, Bangkok, Thailand. Previously projects support manager, Chevron Thailand-China Exploration

and Production, Thailand/China.

Alexandra "Alex" Herger, to director-worldwide conventional new ventures, Marathon Oil, Houston. Previously exploration manager-Gulf of Mexico, Shell Exploration & Production, Houston.

Jesse L. Hunt Jr., has retired after 28 years with the Minerals Management Service. He will be consulting in marine hydrates, residing in Slidell, La.

Dewi J. Jones, to exploration manager-Peru, RepsolYPF, Lima, Peru. Previously exploration manager-Trinidad/Guyana/Suriname, RepsolYPF, The Woodlands, Texas.

John Jostes, to senior international exploitation geologist, Devon Energy, Houston. Previously geologist, Hunt Petroleum, Houston.

L.M. "Mike" Kozimko, to Rockies geology

manager, Yates Petroleum, Denver. Previously geologist, Yates Petroleum, Denver.

Tim Kustic, to district deputy, California Division of Oil, Gas and Geothermal Resources, Sacramento, Calif. Previously associate engineer, California Division of Oil, Gas and Geothermal Resources, Sacramento, Calif.

Richard McLean, to U.S. exploration manager-unconventionals, Marathon Oil, Houston. Previously international new ventures manager, Marathon Oil, Houston.

Larry Miller, to vice president-exploration and business development, Peregrine Petroleum, Houston. Previously area geologist, Hunt Petroleum, Houston.

T. Boone Pickens has been named Texan of the Year by the Texas Legislative Conference, a non-partisan group of Texas business and political leaders who focus on public policy

issues. Pickens, chairman of BP Capital Management in Dallas, is being honored for his public campaign to reduce America's dependence on non-U.S. oil.

Stephen J. Savoie, to senior geologist, Atlas Energy Resources, Traverse City, Mich. Previously senior geologist, Jordan Development, Traverse City, Mich.

Robert H. Springer, to senior staff geologist, Encore Acquisition, Fort Worth. Previously independent consulting geologist, Graham, Texas.

(Editor's note: To be included in "Professional News Briefs" send information in the above format to Professional News Briefs, c/o AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101; or fax, 918-560-2636; or e-mail, smoores@aapg.org; or submit directly from the AAPG Web site, www.aapg.org/explorer/pnb_forms.cfm.)

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GEOPHYSICALcorner

Hey, Who Overturned This Strata?

(The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month's column deals with interpreting overturned strata.)

By BOB HARDAGE

The methodology described here may benefit those who are confronted with the problem of interpreting complex structures from limited-quality 3-D seismic images.

The objective of this study was to characterize deep (20,000 feet/6,000 meters) Ellenburger gas reservoirs in West Texas.

In addition to the Ellenburger reflection signals being weak because of the great depth of the target, the top of the Ellenburger across the area was a gentle, ramp-like increase in impedance that did not produce a robust reflection event. A further negative influence on data quality was that the area was covered by a variable surface layer of low-velocity Tertiary fill that was underlain by a varying thickness of high-velocity salt/anhydrite.

These complicated near-surface conditions made static corrections of the data difficult; in fact, the combination of all of these factors has caused some explorationists to consider the region to be a no-record seismic area for imaging deep drilling targets.

* * *

The interpretation of 3-D seismic data across the project area led to the conclusion that the strongest influence on pre-Pennsylvanian reservoir compartmentalization was the numerous fault systems that distort Ordovician and Mississippian rocks. For this reason, a principal focus of the seismic interpretation was to create a correct structural picture of the pre-Pennsylvanian section.

The challenge: Produce this accurate structural picture from a 3-D seismic volume that was of limited quality.

The overturned Simpson (Ordovician) section documented in study well 78 was particularly important because of its impact on the position of targeted Ellenburger reservoirs in the 3-D seismic volume. Gamma-ray and acoustic logs recorded in well 78 are shown as figure 1. Labeled are:

- ✓ The interpreted top of the Simpson.
- ✓ The fold axis about which beds are overturned within the Simpson section.
- ✓ The three arbitrary stratigraphic intervals (1, 2, 3) that emphasize the bedding symmetry about the fold axis.

In this area the Ellenburger is dolomite, not limestone. Cross-plots of neutron and sonic porosities showed that the industry-provided top of Ellenburger was a limestone facies, which led to the conclusion that the unit was incorrectly identified as top of Ellenburger.

This conclusion then led to the recognition that overturned bedding was present in the log responses.

Note that the log data show units below the fold axis are thicker than

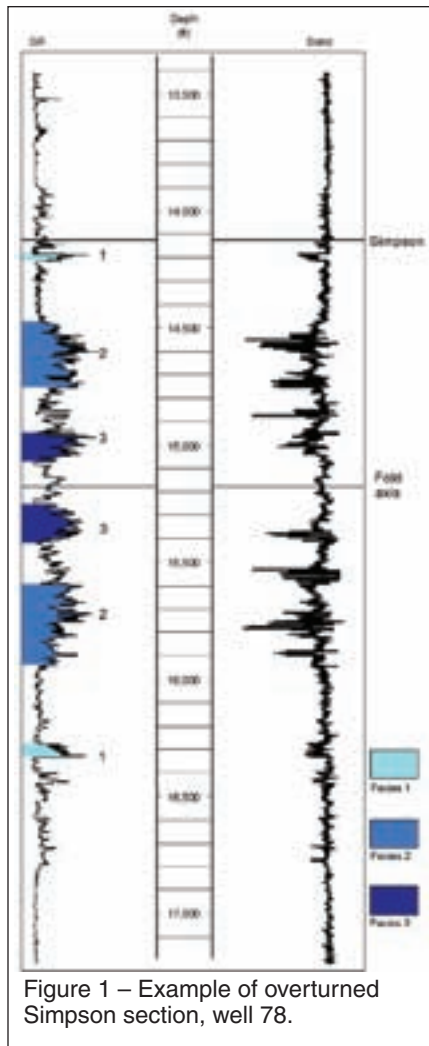


Figure 1 – Example of overturned Simpson section, well 78.

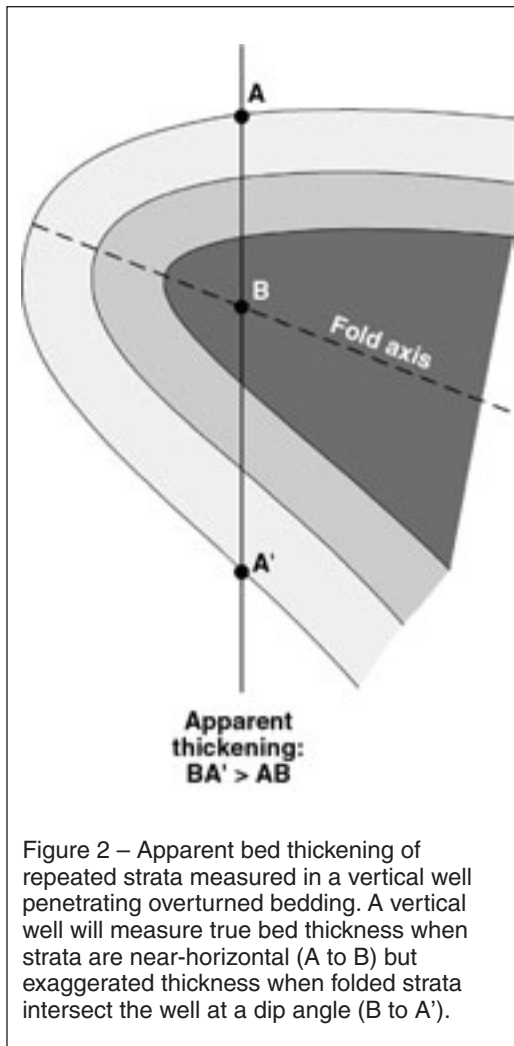


Figure 2 – Apparent bed thickening of repeated strata measured in a vertical well penetrating overturned bedding. A vertical well will measure true bed thickness when strata are near-horizontal (A to B) but exaggerated thickness when folded strata intersect the well at a dip angle (B to A').

their equivalents above the fold axis. This apparent thickening of the deeper repeated bedding is caused by the borehole-to-formation geometry that results when a vertical well bore penetrates an overturned section.

As illustrated on figure 2, log data from a vertical well measure correct bed thicknesses in undisturbed strata between A and B, where the bedding is nearly horizontal. However, logs will show exaggerated bed thicknesses in the overturned section between B and A', where the beds are slanted at a high dip angle relative to the borehole.

Figure 3 shows a vertical section from the 3-D seismic volume that passes through well 78. The major faults in the well's vicinity and the interpreted geometry of the overturned bedding are labeled on the image.

* * *

The principal point is that although overturned strata cannot be interpreted from this limited-quality seismic image, the recognition of overturned beds on log data allows the proper structure to be imposed on the seismic data.

Petrophysical analyses and interpretations of logs can be invaluable when interpreting complicated structure with any seismic data, regardless of seismic data quality – and particularly so when strata are overturned in the dramatic manner illustrated by this example. □

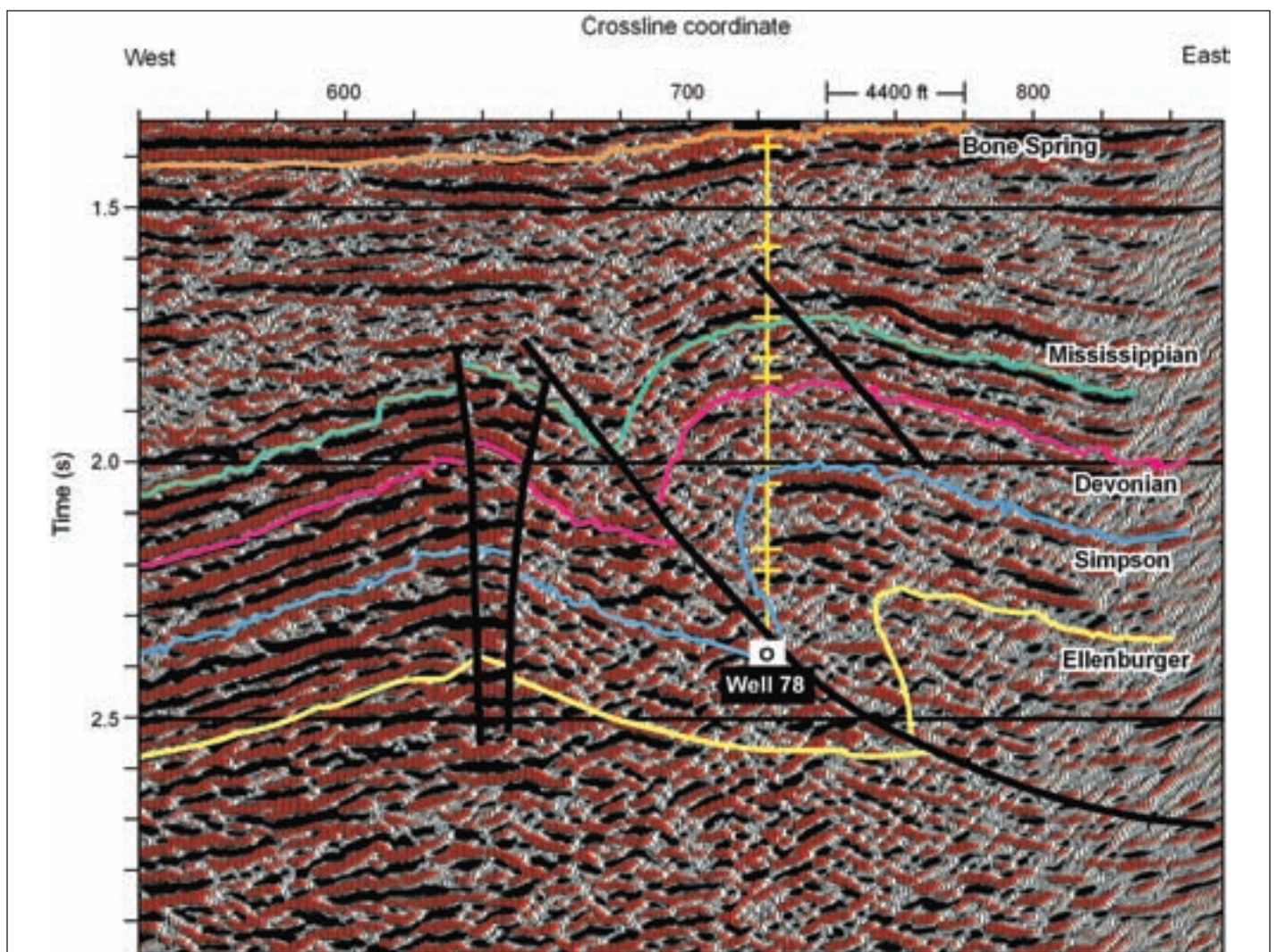
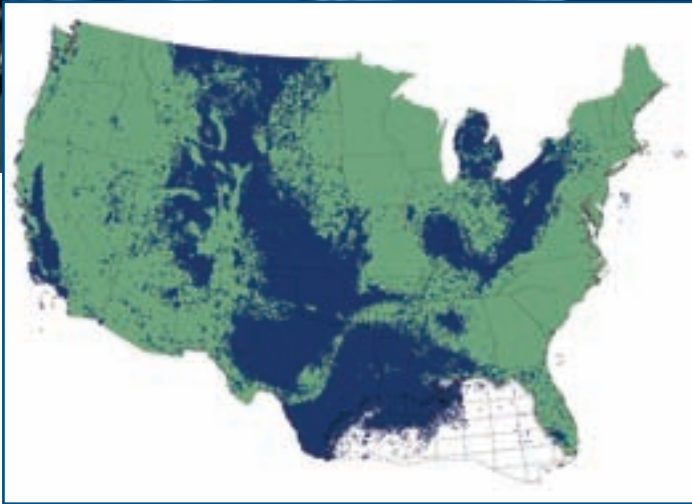


Figure 3 – Seismic section passing through well 78. This seismic profile illustrates the overturned Simpson section that would have been incorrectly interpreted as Ellenburger if industry-provided formation tops were honored. The original (but incorrect) log-defined top of Ellenburger was the well tic at 2.22 sec. After imposing the overturned geology identified by log analysis, well 78 did not penetrate the Ellenburger – and the seismic interpretation was modified to emphasize this fact. Each labeled horizon identifies the top of the particular unit, regardless of whether the label is above or below the horizon. Phantom horizons must be constructed across some image areas.

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WASHINGTONwatch

Energy Likely High on 'To Do' List

By DAVID CURTISS
GEO-DC Director

Nobel Prize winning physicist Niels Bohr once said, "Prediction is very difficult – especially if it is about the future."

The beginning of a new year is the time we traditionally resolve to make the changes necessary to improve our lives. It is also the time we ponder what opportunities and challenges the new year will bring.

Nowhere is that truer than in Washington, D.C., where on Jan. 6 a new Congress convenes and on Jan. 20 the republic's 44th president takes charge.

* * *

The 111th Congress – each Congress is two years long, divided into two one-year sessions – sees Democrats returning with significantly strengthened majorities in both the House of Representatives and the Senate.

In the House of Representatives, with four races still undecided at press time, Democrats have picked up 22 additional seats, bringing their total to 255 seats. Rep. Nancy Pelosi (D-Calif.) will continue to serve as Speaker of the House, while Rep. Steny Hoyer (D-Md.) and Rep. James Clyburn (D-So. Carolina) continue in their respective posts as majority leader and majority whip.

House Republicans currently have a total of 176 seats. Rep. John Boehner (R-Ohio) retains his post as minority leader,



Curtiss

with Rep. Eric Cantor (R-Va.) and Rep. Mike Pence (R-Ind.) stepping up as minority whip and conference chairman. Outgoing Minority Whip Roy Blunt (R-Mo.) and Conference Chairman Adam Putnam (R-Fla.) left leadership after the Republicans' election defeat.

As House members gathered in Washington, D.C., in November to elect their leaders, one bit of drama involved the battle for chair of the Energy and Commerce Committee. Typically, these committee chairs are allocated according to seniority, and confirmed by a pro forma vote of the majority party. Current chair John Dingell is dean of the House, the longest-serving member. However, in a surprising upset, Rep. Henry Waxman (D-Calif.) defeated Dingell, stripping him of this post.

Waxman in turn steps down as chair of

the Oversight and Government Reform, where he has conducted vigorous oversight of government activity. He is widely regarded as a skilled legislator and is expected to play a significant role in advancing Democrat priorities on issues such as energy and climate as chair at Energy and Commerce.

* * *

In the Senate, Democrats picked up seven seats, which combined with the two independents that caucus with them gives them 58 seats. One Senate race (Minnesota) was still undecided at press time – but even with 58 seats, Democrats can dictate Senate action on most issues.

Senate leadership continues unchanged: Majority Leader Harry Reid (D-Nev.), Asst. Majority Leader/Whip Dick

Durbin (D-Ill.) and Vice Chairman of the Democrat Conference Charles Schumer (D-N.Y.) all remain in their posts. Similarly, Minority Leader Mitch McConnell (R-Ky.), Asst. Minority Leader/Whip John Kyl (R-Ariz.) and Republican Conference Chair Lamar Alexander (R-Tenn.) will continue leading Senate Republicans.

Sen. Jeff Bingaman (D-N.M.) continues as chair of the Energy and Natural Resources Committee. Fellow New Mexican Sen. Pete Domenici, the former ranking Republican on the committee, retired, and Sen. Lisa Murkowski (R-Alaska) takes his place.

In a mid-November 2008 speech to the Center for Strategic and International Studies, Sen. Bingaman outlined six energy challenges facing the 111th Congress:

- ✓ Deploying clean energy technology.
- ✓ Improving energy efficiency.
- ✓ Maintaining adequate supplies of conventional fuels as we make the transition to new forms of energy.
- ✓ Increasing energy innovation.
- ✓ Making energy markets more transparent.
- ✓ Maintaining proper balance between energy and environment policies – especially as it relates to global warming.

These challenges will be a prime focus of the Senate Energy and Natural Resources Committee. In his remarks, Sen. Bingaman said:

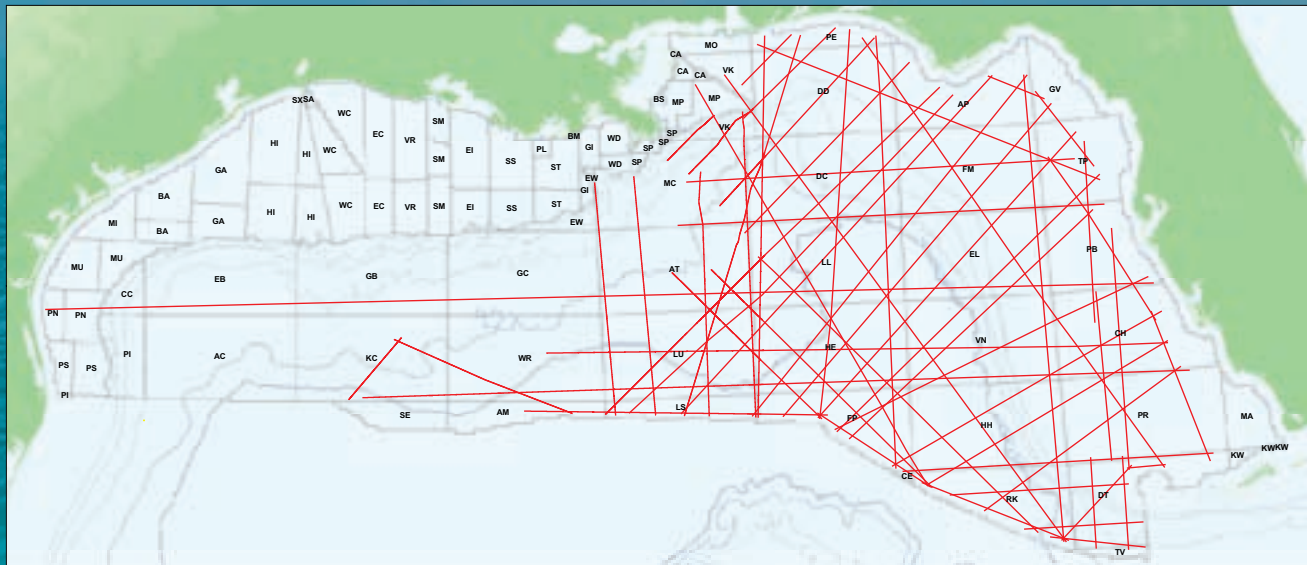
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As the inevitable political debates unfold, stay connected by visiting the GEO-DC blog and signing up for e-mail delivery of our blog posts.

On line now! Check the guest post by Jerry Boak with his analysis and thoughts on the 67 million acres of non-producing oil and gas acreage.



Deep East - Offshore Florida

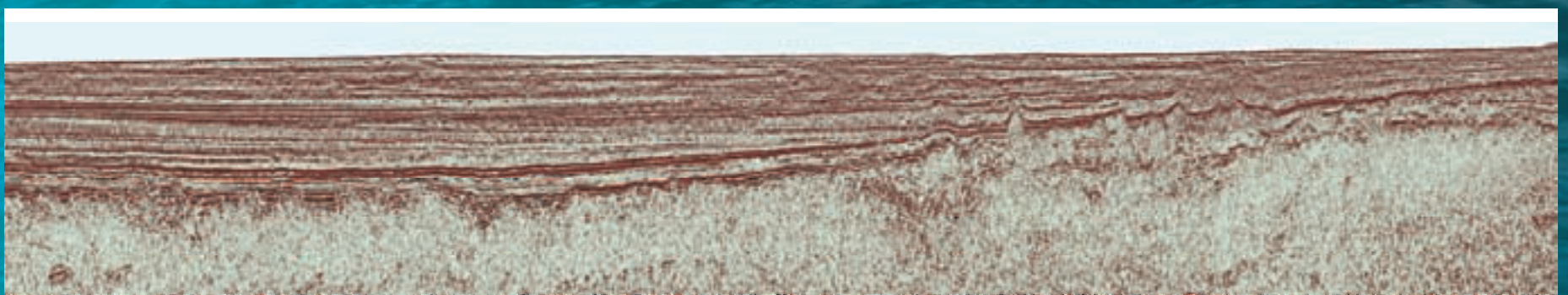


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“Energy is not, in my view, an inherently partisan issue. If we care about our nation’s future, we need to look for the bipartisan, substantive and forward-looking approach to energy that has marked our successes and progress in the past.”

* * *

As President-elect Barack Obama takes the oath of office on Jan. 20 and delivers his inaugural address, he will lay out the priorities for his term. Based on his campaign and subsequent statements, it’s likely that the economy, energy and the environment will be high on the list.

These are not a simple set of challenges.

AAPG President Scott Tinker stated in a Dec. 5 letter to the President-elect these three issues are closely interlinked (see page 4). Because of these linkages, policies in one area must be developed in concert with policies for the other areas.

Our new president and Congress should bear this in mind as they deal with these issues.

AAPG members can help shape the policy discussions we’re embarking on:

- ✓ Tell the story of how you contribute to the affordable availability of energy that benefits your neighbors and community – and how you do it in an environmentally responsible manner.

- ✓ Don’t focus on political rhetoric, because it’s always heated and typically uninformed. Instead focus on the details – the parts of legislation that no one is talking about.

- ✓ If you are a U.S. member, tell your legislators to pursue Bingaman’s goal of a bipartisan, balanced approach to meeting the nation’s energy, environmental and economic needs.

- ✓ Recognize that achieving bipartisan, balanced solutions necessitates compromise, and that no side is ever entirely satisfied because politics is the art of the possible.

As Bohr’s quote suggests, prediction is a foolish game. A far better idea is to shape the future into something worth experiencing.

It takes fortitude, stamina and a lot of hard work – kind of like keeping those New Year resolutions.

I wish you all the best in 2009. □

(Editor’s note: David Curtiss, head of AAPG’s Geoscience and Energy Office in Washington, D.C., can be contacted at dcurtiss@aapg.org; or by telephone at 1-202-684-8225.)

Education Director Named

Susan Smith Nash has been named director of a newly created department of education services for AAPG.

Nash, an AAPG member who has extensive experience in professional continuing education, will take the reins of AAPG’s education program that was formed from existing programs – including the Petroleum Technology Transfer Council, which AAPG has managed since 2007 through the Geosciences directorate.

Nash has served on the AAPG Education Committee since 2005. She received a bachelor’s degree in geology from the University of Oklahoma and also earned a master’s degree and a doctorate in English from OU. She worked as a geologist and international



Nash

operations analyst for Valley Exploration, Diamond-Shamrock, Kerr-McGee and Victoria Resources before launching a career in interdisciplinary studies, including science education at St. Gregory’s College in Shawnee, Okla., and then in a number

of positions at OU.

Activities included course programming in engineering and geosciences continuing education, distance geosciences education at Sarkeys Energy Center and online

interdisciplinary studies at the College of Liberal Studies.

Her experience includes managing educational programs, conferences, degree and non-degree programs. Creator of an award-winning edublog, Nash also has supervised and managed the production of educational materials used in all phases of distance education, from textbooks to e-books, podcasts, videocasts and open courseware.

Fluent in Spanish, Nash has managed international educational and economic development programs. She also served as associate dean at Excelsior College, an accredited distance learning university in Albany, N.Y. □

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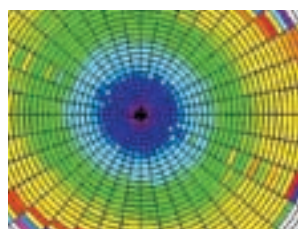
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REGIONS&sections

NAPE Welcomes
AAPG President

AAPG President Scott Tinker was on hand for the "changing of the guard" reception during the recent Nigerian Association of Petroleum Explorationists (NAPE) conference, flanked by NAPE's new president, Victor Agbe-Davies (left, with his wife), and the immediate past president, Kingsley Ojoh (with his wife, right).

By CAROL MCGOWEN
Regions and Sections Manager
AAPG President Dr. Scott W. Tinker became the fourth Association president to visit Nigeria when he attended November's NAPE 2008 conference in Abuja, Nigeria.

The meeting was organized by the Nigerian Association of Petroleum Explorationists. Tinker's travels to Nigeria followed visits by AAPG presidents Toby

Carleton (1994), Dick Bishop (1998) and Robbie Gries (2000, 2001), who visited as both president-elect and president.

Visits by Carleton, Gries and Tinker were hosted by Chevron, and Bishop's visit was hosted by ExxonMobil.

In October Tinker had met with Africa Region leaders during the group's leadership meeting in Cape Town, also attended by NAPE president, Kingsley Ojoh.

Tinker's visit to the Africa Region twice in one year was seen as the "icing on the cake" in efforts to strengthen AAPG's ties with affiliate society NAPE.

In fact, a commemorative cake for the occasion was cut by outgoing NAPE President Ojoh and incoming NAPE President Agbe-Davies. A second commemorative cake welcomed Tinker, to Nigeria.

"I could not have been welcomed more warmly," Tinker said.

During the first of his two days at the conference Tinker met with all NAPE leadership, had lunch with university faculty and attended the awards dinner and ceremony. During a tour of the exhibit, Tinker stopped for a photo with no less than every exhibitor. The next day he participated in a meeting with students and faculty, looked at conference facilities with an eye for future AAPG-NAPE events, toured Abuja's historical sites and was the first to initiate dancing at the Sundowner event – a lead that the students soon followed!

Tinker said the current business climate in Nigeria is favorable for the industry and for AAPG. Adding to the business climate are strong corporate interest to develop partnerships in Nigeria among U.S. and expatriate corporations such as ExxonMobil, Shell and Chevron and vendors including Schlumberger and Halliburton, among many others.

The Nigerian business climate is further enhanced by a growing independent oil and gas community. A recent law requiring reinvestment in Nigerian businesses promotes growth among local Nigerian entrepreneurs.

The Nigerian National Petroleum Corporation (NNPC), based in Abuja, rounds out the strong industry presence in the country.

Tinker's personal visit to the country already has yielded a better understanding of the professional development interests of the Nigerian geoscience community. In response to the keen interest for AAPG products and services in Nigeria, AAPG Distinguished Lecturer John Kaldi, Australian School of Petroleum, University of Adelaide, is now scheduled to tour the country during the third quarter of 2009 (see related story, page 48).

Over 70 percent of AAPG Africa Region's members are located in Nigeria.

"NAPE and its leaders represent an outstanding partner for AAPG in the Region," Tinker said.

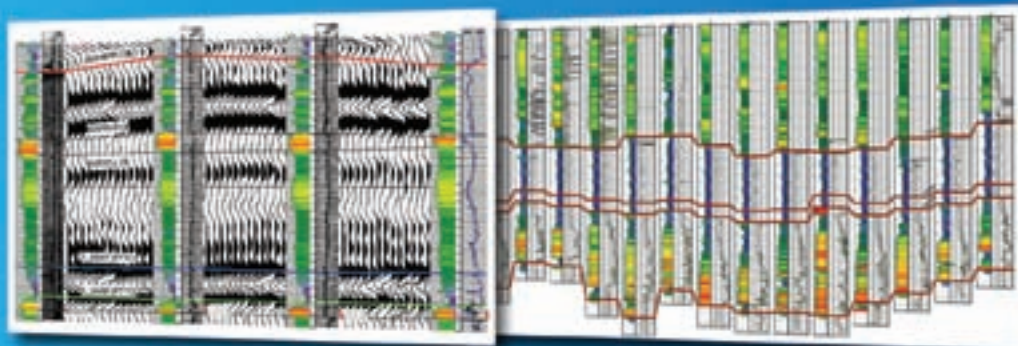
In fact, with leadership from current AAPG Africa Region President James Agbenorto, the Region is committed to AAPG's increased support and involvement in the planning and operation of the NAPE 2010 conference. □

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*Communication comes naturally***Scholles Capture Carbonate Appeal**

By BARRY FRIEDMAN
EXPLORER Correspondent

Dana S. Ulmer-Scholle, co-instructor along with husband, Peter, of the first-ever short course to be offered through AAPG's new office in Bahrain, remembers the first time she knew she wanted to be a geologist.

Actually, her mother remembers.

"My mother always claimed my first word was rock," she said. "The second was pretty rock."

The Scholles, award-winning co-authors of AAPG's popular Memoir 77, *A Color Guide to the Petrography of Carbonate Rocks*, will be talking a lot about rocks in Bahrain; in fact, their short course, "Integrated Petrography and Geochemistry of Carbonate Rocks and its Application to Reservoir Studies," will be based on the book itself.

"Having Memoir 77 available is a huge help in teaching the course," said Peter Scholle, who is the director and state geologist with the New Mexico Bureau of Geology and Mineral Resources.

"It took years to put the book together," he explained, "and getting the information packed into a single volume gave us a chance to make the value judgments of what is most important to the majority of end users. So the class is mainly about getting students to do the needed observations, teaching them the little tricks that will guide them into efficiently using the resources available in the book and in other reference works.



Photos courtesy of Peter Scholle

Award-winning AAPG authors Dana Ulmer-Scholle and Peter Scholle: Their marriage is as much defined by their work as their work is by their marriage.

"The fact that AAPG is providing a setting with microscopes will give the students a chance to practice and learn to fly on their own," he added, which is "a great help in a course like this."

Dana, associate research professor of geology in the Department of Earth and Environmental Sciences at University of New Mexico, says the secret of the book's success, which is subtitled "Grains, Textures, Porosity, Diagenesis," is clear and obvious.

"Lots of photographs and figures!" she said. "If you show nothing but text I think people get lost – especially if English is not their first language."

The Tie That Binds

Like many couples involved in the same profession, the Scholles' marriage is as much defined by their work as their work is by their marriage.

"Dana does especially well the

things that I do not have the patience for," Peter said, "especially fluid inclusion studies."

Dana amplifies her husband's take on the dynamic.

"We respect each other's opinions, but we do argue about interpretations since we don't always agree," she said. "I think most people are bemused or amused by our squabbling over things like what fossil is in a rock, or 'What fabric is that?'"

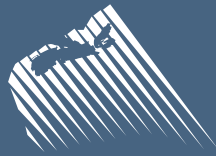
Fluid inclusion studies ... squabbles over rocks, fossils and fabrics! That's it? All marriages should have such problems.

Peter says having a spouse in the classroom with you is both natural and competitive.

"Geology is such a huge component of our life and has provided us with the ability to work together, travel together (and) share insights together that I think

See **Scholle**, page 42

CNSOPB



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The Call for Bids consists of two Board nominated deepwater parcels located southwest of the Sable Subbasin where 23 discoveries have been made.

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- A number of promising structures are present in an area down-slope from a major Early Cretaceous river system, where seismic stratigraphic studies suggest deepwater sands were deposited.
- Gas bearing sands encountered in the nearby Newburn H-23 deepwater well (and several other deepwater wells on the Scotian slope) demonstrate a working hydrocarbon system is present in deepwater, and that clastics as coarse as pebble conglomerates were transported into deepwater.

Seismic and well data for the parcels is available in digital format from the Board's Data Management Centre: www.cnsopbdmc.ca.

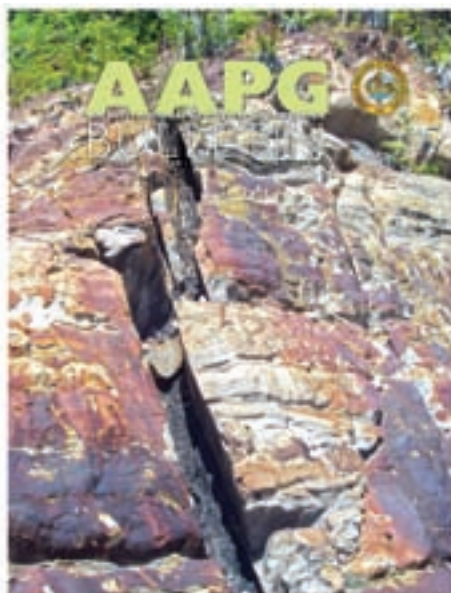
The Board is the independent joint agency of the Governments of Canada and Nova Scotia responsible for the regulation of petroleum activities offshore Nova Scotia.

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The January 2009 cover of the AAPG Bulletin

More science than you can shake a pick at.

Middle Atokan sediment gravity flows in the Red Oak field, Arkoma Basin, Oklahoma – A sedimentary analysis using electrical borehole images and wireline logs

Chunming Xu, Thomas P. Cronin, Thalbert E. McGinness, and Brad Steer

Multiwell borehole images and open-hole logs allow detailed analysis of structural and depositional processes in two turbidite systems. Facies, bedding features, and syndepositional deformation structures are used to correlate and map the Red Oak and Fanshawe units across the field.

Remote sensing detection of heavy oil through spectral enhancement techniques in the western slope zone of Songliao Basin, China

Guifang Zhang, Lejun Zou, Xiaohua Shen, Shanlong Lu, Changjiang Li, and Hanlin Chen

Landsat-7 enhanced thematic mapper plus images were spectrally enhanced to identify areas of hydrocarbon leakage on the western slope of the Songliao Basin, China. Field data and image analyses are consistent, indicating these remotely sensed data are feasible for detecting surficial anomalies resulting from subsurface hydrocarbon leakage.

Origin of overpressure and pore-pressure prediction in the Baram province, Brunei

Mark R. P. Tingay, Richard R. Hillis, Richard E. Swarbrick, Chris K. Morley, and Abdul Razak Damit

Overpressures in inner shelf deltaic sediments are transferred via faults from underlying prodelta shales. Sonic and density log data can be used to distinguish vertically transferred and disequilibrium-compaction overpressures, which require different pore-pressure prediction strategies.

Present-day stress and neotectonics of Brunei: implications for petroleum exploration and production

Mark R. P. Tingay, Richard R. Hillis, Chris K. Morley, Rosalind C. King, Richard E. Swarbrick, and Abdul Razak Damit

Variation in contemporary stress across the Baram Delta, Brunei reveals a delta system that is inverting and self-cannibalizing as the delta system rapidly progrades across the margin. Orientation of maximum horizontal stress rotates across the basin, with implications for fault reactivation and optimal directional drilling.

Quantitative seismic geomorphology of a quaternary leveed-channel system, offshore eastern Trinidad and Tobago, northeastern South America

Lesli J. Wood and Kristine L. Mize-Spansky

A study of a 200-m interval of a deep-marine leveed-channel system immediately below the modern sea floor offshore Trinidad suggests that local structural features and sea-floor slopes exert more influence on channel morphology and occurrence than do eustatic sea level factors. This could aid in development of predictive models of reservoir distribution and channel-system morphology in similar settings around the world.

Physical properties of Cenozoic mudstones from the northern North Sea: Impact of clay mineralogy on compaction trends

Øyvind Marcussen, Brit I. Thyberg, Christer Peltonen, Jens Jahren, Knut Bjørlykke, and Jan Inge Faleide

Vertical and lateral variations in clay content of North Sea mudstones are examined and considered in terms of burial history and provenance. Smectite content affects compaction, with implications for overpressuring, seismic response, density, and basin modeling.



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Also, submit your next paper for consideration via <http://www.aapg.org/Bulletin/>

The AAPG is diligent about timely publication of the geoscience of the day.

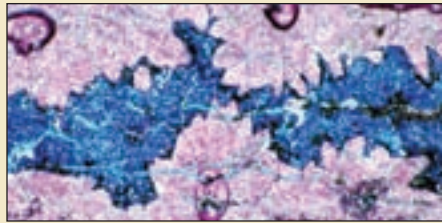
Course Offered in Bahrain

The first short course presented through AAPG's new Middle East office will be offered Jan. 18-22, taught by two successful and popular AAPG authors.

"Integrated Petrography and Geochemistry of Carbonate Rocks and Its Application to Reservoir Studies" will be presented at the Sheraton Hotel and Towers in Manama, Bahrain, taught by Peter Scholle and Dana Ulmer-Scholle.

The two are authors of AAPG Memoir 77, *A Color Guide to the Petrography of Carbonate Rocks*, which was designed to aid geologists' understanding of the importance and value of petrography (see accompanying story.)

The course will be a lecture and



discussion class, with practical thin section laboratory exercises. Course specifics include:

- ✓ Recognition of constituent biotic and non-biotic grains and diagnostic sedimentary fabrics to establish or refine interpretations of depositional environments.

- ✓ Classification of carbonate rocks.
- ✓ Recognition of types of diagenetic alteration (replacement, inversion, dissolution, cementation, etc.) and interpretation of their origin and timing.
- ✓ Recognition of basic porosity types and their origin.
- ✓ Fundamentals of geochemical analysis (mainly cathodoluminescence, fluid inclusion microscopy and carbon/oxygen and strontium isotopic analysis) and discussion of their application to the interpretation of carbonate rock diagenesis.
- ✓ Discussion of time- and cost-effective integration of petrography and geochemistry. □

Scholle
from page 40

it inseparable from a 'personal' image of each other," Peter said.

"Dana is wife, colleague, accomplished scientist and friend all rolled together," he added. "Perhaps 'codependent' is the clinical word, but it works for us."

Dana, too, sees the dynamic as collaboration.

"We both have careers we really love."

Peter believes it was this kind of cooperation and interest that made the course possible.

"What got this started was a comment by AAPG folks about the high sales of Memoir 77 at a meeting in the Middle East," Peter said, adding that he and Dana suggested that perhaps it would be a good idea to follow up with a hands-on course.

"Having worked on-and-off over the years in the U.A.E. and Qatar (and having filmed a movie with AAPG in those countries in 1985) made it seem even more right," he added.

Masters of Space and Time

Even though they are based in New Mexico, the Scholles have done research or consulting projects in many countries around the world, which is reflected in the diversity of those pictures featured in Memoir 77.

When Peter is in New Mexico, though, his work isn't just geologic; it's also political.

"I find teaching and the detective work of research very rewarding, although I get to do it far less today than in the past," he said. "But I also enjoy what I am doing in my current job, which largely is trying to translate what geologists do into words understandable by the general public and legislators.

"As geologists, I think we all feel that what we do is important, whether it is finding energy, mineral or water resources, working to predict or mitigate geologic hazards, or fundamentally understanding how our planet works, now and in the past and future," he said.

"Explaining any of those things to legislators and getting funding for geosciences that is proportionate to its societal importance, however, remains a considerable challenge."

Dana suggests the ability to communicate about such things comes first from the love of the material.

"In sedimentology we so often use the phrase the present is the key to the past," she said. "In clastics this may be mostly true, but in carbonates the variables of evolving faunas, extinction events, environmental conditions and diagenesis make this much more difficult to directly apply."

She says getting students to understand how space and time relate to each other in carbonates is extremely important to understanding possible reservoir conditions/potential.

"I like to tell them that carbonates can be a lot like a detective story where you are trying to figure out who did what and where as well as why and how the diagenetic changes affect the rock as a whole.

"I guess it is the detective story lover in me," she added. "I really enjoy unraveling the history of a sample and trying out new analytical techniques to see if we can get a more complete picture of what a sample went through during deposition and diagenesis."

That ... and all those pretty rocks. □

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Day Two: 4 March 2009

- ▶ Theme: Unconventionals Session
- ▶ Prospect Forum
- ▶ Lunch
- ▶ Prospect Forum
- ▶ Regional: Far East Session
- ▶ Sponsored Reception

Day Three: 5 March 2009

- ▶ Theme: Global Carbonate Potential
- ▶ Regional: Africa/Middle East Session
- ▶ Lunch
- ▶ Short Courses/Seminars
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- ▶ Conference Closes
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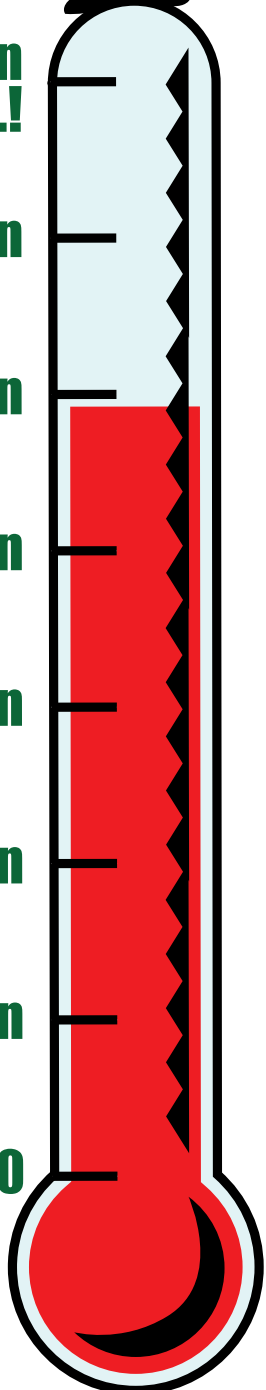
\$20 million

\$15 million

\$10 million

\$5 million

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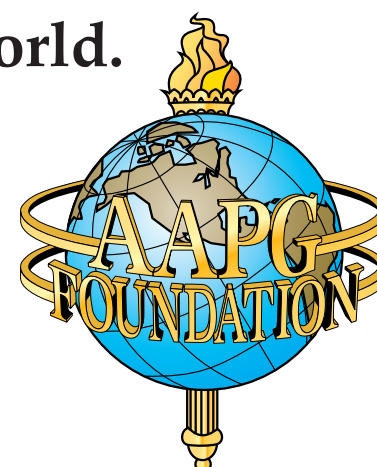
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For program details or to provide your support for the “Meeting Challenges...Assuring Success” campaign contact Rebecca Griffin, Foundation Manager at rgriffin@aapg.org, or phone 918.560.2644; or Alison Robbins, Corporate Relations Development Coordinator at arobbins@aapg.org, or phone 918.560.2674.



2008 year-end gifts will be included in the February update.

WWWupdate

Internet World Can Get Murky

By JANET BRISTER
AAPG Web Editor

Have you ever noticed how similar "spam," "scam" and "scum" are? I love those word ladder games, but in this case the changing of one letter each time brings up a four-letter word that has tainted the cyberworld.

What's a person to do?

Spam!

I just trashed 10,430 e-mails from my junk folder, all of which accumulated over a five-day period.

The good news is I have my junk

The AAPG Blog Zone is a great way to stay on top of the latest news from AAPG regarding GEO-DC activities, student chapters and new additions to the AAPG Web site.

Simply go to blog.aapg.org and see what's up.

Once there you may as well take a moment to subscribe to any or each of the blogs that interest you.

filter set on high AND all those e-mails in that folder were truly junk.

The best news is I could right-click on the folder and empty it without weighing down my trash. (I love new software!)

Maybe your e-mail client has that capability, too.

Scam!

In May 2001 the EXPLORER reported on an old scam resurfacing: An e-mail/letter soliciting funds and getting the recipient to transfer money to unknown accounts – and ultimately losing their funds or identity.

With the world economy facing major downturns it seems to be time to re-visit this topic – again.

It seems an e-mail with an urgent request for funds has begun to hit e-mail boxes again. (There always seems to be someone who wants to prey on the unaware.)

Recently AAPG member Jeannie Mallick, a past-secretary of the House of Delegates, forwarded an e-mail to AAPG that included solicitation for funds that seemed to have AAPG's implied endorsement. She wanted to know, rightly, what this was all about.

Here's the scary part: The e-mail *seemed* legitimate because it was *seemingly* sent by a member – indeed, an officer – of AAPG.

In fact, it was all an attempted scam. The e-mail was false.

James Agbenorto, newly elected president of the AAPG Africa region, was shocked and upset to learn that his name and e-mail address had been used in this manner.

Agbenorto, of Ghana National Petroleum, did NOT send this e-mail – despite what the letter said. An unknown sender stole Agbenorto's e-mail and name from an unknown source and sent his urgent spam, placing Agbenorto's e-mail address in the "Reply-to" line.

Agbenorto, unfortunately, was the random person chosen by this scammer to attempt to legitimize his spam. In a matter of minutes this scammer robbed enough of Agbenorto's identity to force him to begin the daunting task of restoring his personal information.

Scum!

Again, the above incident most likely happened through a random selection, and while it's extremely unfortunate for Agbenorto, AAPG wants our membership aware this activity is surfacing again.

There are people preparing to prey upon the uninformed, the trusting, the caring and the gullible. And they'll prey on everyone else, too.

They are "phishing" – a label used for soliciting bank account and credit card information – and they could be anywhere.

So what can you do?

The U.S. Department of Justice offers this acronym:

S – Be **Stingy** with your personal information, giving it only to those you trust.

C – **Check** your financial information regularly and look for discrepancies.

A – **Ask** periodically for your credit report


M – **Maintain** careful records of your accounts and transactions.

Ignorance is not bliss – take some time to do some research on identity theft prevention and how you can fight back against spam. A simple search on Google of "identity theft" offered an enormous number of possibilities.

We encourage you to look into sites for reporting and avoiding e-mail scams. The U.S. government has provided ftc.gov/spam and ftc.gov/idtheft.

Your greatest defense is knowledge and awareness.

Good browsing! ☐



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FIELD SEMINARS

Modern Terrigenous Clastic Depositional Systems

April 5-12, 2009 / Begins in Columbia and ends in Charleston, SC
Leader: Walter J. Sexton, Athena Technologies, Inc.; Columbia, SC



Clastic Reservoir Facies and Sequence Stratigraphic Analysis of Alluvial Plain, Shoreface, Deltaic, and Shelf Depositional Systems

April 18-24, 2009 / Begins and ends in Salt Lake City, UT
Leader: Thomas A. Ryer, The ARIES Group, LLC, Katy, TX



Submarine Canyons, Channels, Fans and Deep-Water Sequence Stratigraphy

April 19-22, 2009 / La Jolla, San Diego County, CA
Leader: John E. Warme, Colorado School of Mines, Golden, CO



SHORT COURSES

Seismic Interpretation in Fold- and Thrust-Belts Using Fault-Related Folding Techniques

March 23-26, 2009 / Houston, TX
Instructor: John H. Shaw, Harvard University, Cambridge, MA



Principles of Reservoir Characterization

April 2-3, 2009 / Houston, TX
Instructor: Jeffrey Yarus, Landmark Graphics Corp., Houston, TX



Petroleum Exploration in Fold and Thrust Belts: Principles And Practices

April 15-16, 2009 / Houston, TX
Instructor: Peter B. Jones, International Tectonic Consultants Ltd., Calgary, AB, Canada



Basic Well Log Analysis

April 20-23, 2009 / Austin, TX
Instructors: George B. Asquith, Texas Tech University, Lubbock, TX; Daniel A. Krygowski, The Discovery Group, Denver, CO



Practical Salt Tectonics

April 22-24, 2009 / Austin, TX
Instructor: Mark G. Rowan, Consultant, Boulder, CO



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American Association of Petroleum Geologists

FOUNDATIONupdate

Grants-in-Aid Deadline Draws Near

Applications are now being accepted for the AAPG Foundation's Grants-in-Aid program, awarded to foster research in the geosciences.

This year the AAPG Foundation will be providing \$206,000 through the program.

Grants are made annually to graduate students around the world to provide financial assistance to those whose thesis research has application to the search for and development of petroleum and energy-mineral resources, and/or to related environmental geology issues.

Grants are based on merit and, in part, on financial need. Although the program's focus on master's or equivalent degrees, qualified doctoral candidates also are encouraged to apply.

Factors weighed in selecting successful applicants include: the qualifications of an applicant as indicated by past performance; originality and imagination of the proposed project; support of the department in which the work is being done; and perceived significance of the project to petroleum, energy minerals

and related environmental geology.

The GIA program has become increasingly international in scope, with recent awards going to students from Africa, Australia, Cameroon, Canada, China, France, Germany, Italy, Lithuania, Netherlands, New Zealand, Nigeria, Poland, Saudi Arabia, Slovakia and the United Kingdom.

Students are encouraged to apply online at <http://foundation.aapg.org/gia/index.cfm>.

The application deadline is Jan. 31.

In addition, the Named Grants program is a special endowed segment

of the Grants-in-Aid program, and students should look online <http://foundation.aapg.org/gia/names.cfm> for Named Grants restricted to their specific university or area of research to increase their chance of receiving an AAPG Foundation Grants-in-Aid.

* * *

The Foundation's financial campaign, "Meeting Challenges ... Assuring Success" received several new generous gifts recently. They include:



Wisda

✓ Lynn Pettijohn Wisda of Houston provided funding to establish an endowment for a Digital Products subscription to Johns Hopkins University. Wisda's gift is designated in memory of Frances J. Pettijohn, and will

provide online access to the entire AAPG Data Pages Library in perpetuity to students and faculty at Johns Hopkins.



Withrow

✓ Trustee Associates Jon R. Withrow and David Worthington have provided funding for the AAPG Grants-in-Aid Program.

Withrow provided funding to establish the Jon R. Withrow Named Grant in the amount of \$500 for a graduate student at the University of Oklahoma; Worthington contributed additional funding to the David Worthington Named Grant, which will support a \$2,000 annual grant designated to a graduate student at Rice University.



Worthington

✓ Campaign co-chair Jack C. Threet provided additional funding to the Jack C. and Catherine I. Threet Endowed Fund for the Advancement of Petroleum Geology.



Threet

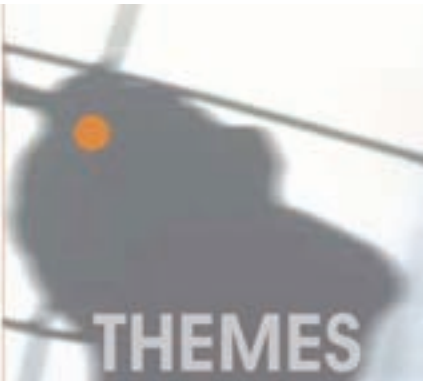
All members are encouraged to support the Foundation and join the campaign today. For information contact Rebecca Griffin, Foundation manager, at 918-560-2644 or rgriffin@aapg.org.

* * *

Finally, two new members joined the Foundation Trustee Associates. They are:

- ☐ John Kimberly, Midland, Texas.
- ☐ William Watson, Midland, Texas. ☐

Foundation contributions on next page




Learning From the Past

1. Failures and lessons learned during the exploration of the Subandean basins
2. Why is there oil in Subandean basins?
3. Failures, successes and lessons learned in the use of new seismic technologies
4. Stories of successful and not-successful operations in sensitive areas
5. Stories of dry wells: short-term failure may lead to long-term success

Looking to The Future

1. Do new exploration plays exist in the Subandean basins?
2. Sequence stratigraphy applied to improve exploration and production of hydrocarbons in the Subandean basins
3. Mature Fields - A new exploratory challenge
4. New advances in the structural interpretation of the Subandean basins - Learning from our mistakes
5. Do faults seal? - Models and applications in exploration and production of hydrocarbons
6. Hydrodynamic Traps - Fiction or reality?
7. Regional variations of hydrocarbons types across the Subandean basins - How to avoid errors in predicting fluid properties
8. Regional basin modelling applied to the analysis of the petroleum systems in the Subandean basins: is it really useful?
9. Prospectivity of the Andean fold and thrust belts: Romanticism vs Realism
10. Evidences of tectonic inversion in Subandean basins and the implication in hydrocarbons exploration
11. Are there any Giant fields to be discovered in Subandean basins?
12. Exploration and production of heavy crude oil - Present and Future



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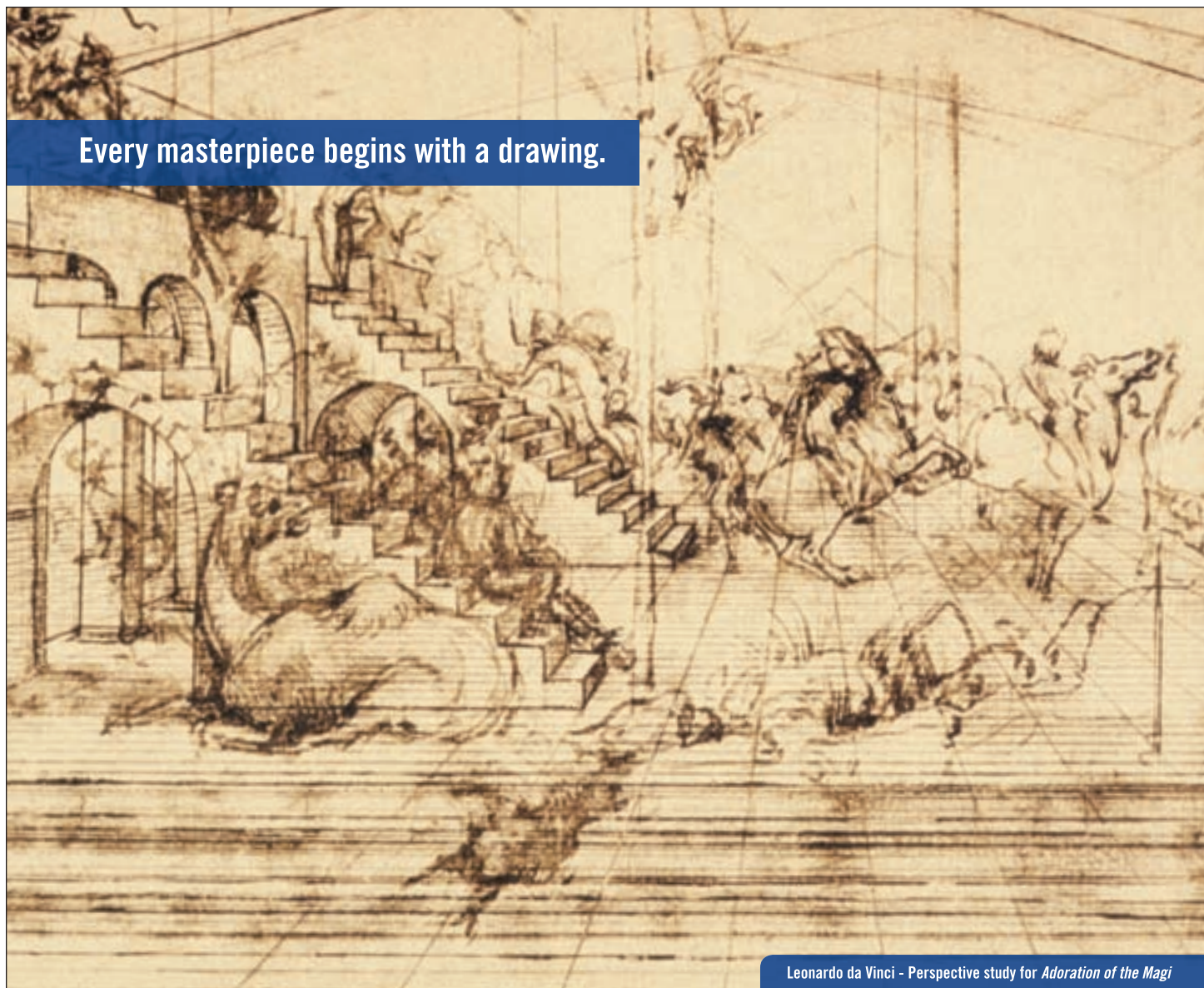
Tako Koning
In memory of K.K. Landes
Paul F. Ozanich

INmemory

Rodney A. Bernasek, 69
Lakewood, Colo., Oct. 1, 2007
Robert H. Breitenwischer, 79
Houston, Sept. 10, 2008
Gerald W. Flocks (EM '54)
Gainesville, Fla.
Gilbert N. Freeman (EM '52)
Scottsdale, Ariz.
Harry Hadler, 88
Edmond, Okla., Aug. 28, 2008
Robert A. Harris, 87
Houston, Oct. 22, 2008
George L. Keppta (EM '54)
Plano, Texas
John A. Levorsen, 75
Boise, Idaho, Aug. 7, 2008
David H. Rathjen, 78
Midland, Texas, May 30, 2008
Donald D. Reitz (AC '70), Denver

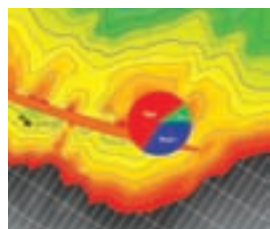
George D. Springer, 90
Calgary, Canada, Nov. 15, 2008
John G. Stout, 82
Calgary, Canada, May 16, 2008
Glen C. Thrasher, 94
Cheverly, Md., March 23, 2008
Albert M. Tolbert, 85
Salado, Texas, March 10, 2008

(Editor's note: "In Memory" listings are based on information received from the AAPG membership department. Age at time of death, when known, is listed. When the member's date of death is unavailable, the person's membership classification and anniversary date are listed.)



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Largest DL program ever**Lecturers to Travel Global Trails**

By VERN STEFANIC
EXPLORER Managing Editor

An ongoing aggressive and focused effort to provide AAPG's popular Distinguished Lecture program to all parts of the planet is taking a giant step forward this year.

This year's DL international effort, funded largely by the AAPG Foundation, will offer six lecturers and one new Distinguished Instructor who together will be covering 17 different talks, spread out over almost every Region under the AAPG banner.

Only Latin America is unrepresented at this time – and officials say that's just a temporary status.

The seven new names, when added to the 10 domestic speakers who began their season last fall, makes this year's DL program the largest in Association history.

It's all part of a concentrated effort to make information and expertise available to as many geoscience groups as possible.

AAPG's DL program was developed to expose students, young geologists, college faculty members and members of geological societies to current information, research and thinking.

This year's program, as in past years, offers speakers from both industry and academia, all offering topics that are targeted specifically for their Region.

Also, support for some tours comes directly from specifically designated funds from the AAPG Foundation. This year they are:



Heine



Issler



Kaldi



Martinsen



Peters



Rowan

□ **The Roy M. Huffington Distinguished Lecturer** – An international tour provided by contributions from the Huffington family in honor of the oilman-geologist.

This year's Huffington Lecturer is **Ole J. Martinsen**, with Statoil Hydro Research in Bergen, Norway. He's one of two lecturers set for the Asia-Pacific Region, and he'll be offering two talks:

✓ "Deepwater Sedimentary Processes and Systems: The Role of Internal vs. External Controls on Lithology Distribution and Stratigraphy."

✓ "Sequence Stratigraphy 25 Years Down-the-Road: Technology Dependencies, Current Practices and Evolving Methods for Prediction of Petroleum Systems."

□ **The Dean A. McGee International Distinguished Lecturer** – Provided by contributions from Kerr-McGee, which annually supports international speaking tours.

This year's McGee Lecturer is **Frans S. Van Buchem**, with Maersk Oil Qatar AS in

Doha, Qatar. He'll be touring the Middle East Region, offering two talks:

✓ "Barremian/Aptian Carbonate Systems of the Eastern Arabian Plate – A Global Sequence Stratigraphic Reference Model."

✓ "Stratigraphic Patterns in Carbonate Source Rock Distribution – With Special Attention to Cretaceous Intraself Basins of the Southern Arabian Plate."

The remaining lecturers, by the Region they'll be touring, are:

Asia-Pacific Region

□ **Dale R. Issler**, Geological Survey of Canada, Calgary, Canada, who offers two talks:

✓ "Integrated Thermal History Analysis of Sedimentary Basins Using Multi-Kinetic Apatite Fission Track Thermochronology: Examples from Northern Canada."

✓ "Quantitative Analysis of Petroleum Systems of the Beaufort-Mackenzie Basin, Arctic Canada: A Multi-Parameter Investigation."

Europe Region

□ **John G. Kaldi**, Australian School of Petroleum, University of Adelaide, Australia. He'll offer five lecture options:

✓ "Carbon Capture and Geological Storage: What are the Big Issues and Opportunities?"

✓ "CO₂ Storage Capacity Estimation and Site Selection."

✓ "Evaluating Seal Potential for Hydrocarbon Accumulations."

✓ "Pore-level Reservoir Characterization."

✓ "Geological Applications of Capillary Pressure: Taking the Mystery out of Basic Rock Properties."

✓ **Kenneth E. Peters**, Schlumberger and Stanford University, California. He'll offer two lectures:

✓ "Establishing Petroleum Systems: Biomarkers, Isotopes and Chemometrics."

✓ "Exploration Paradigm Shift: The Dynamic Petroleum System Concept."

Middle East Region

□ **Christian J. Heine**, Saudi Aramco, Dhahran, Saudi Arabia. He'll offer two lectures:

✓ "The Unayzah Reservoirs: A Post Glacial Sea-Level Rise Preserves in Rock the Northward Movement of the Arabian Plate from Glacially Incised Valleys Through an Early Permian, Mid-Latitude Desert."

✓ "Where Does Up-Scaling Begin?"

[continued on next page](#)



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MEMBERSHIP & certification

The following candidates have submitted applications for membership in the Association and, below, certification by the Division of Professional Affairs. This does not constitute election nor certification, but places the names before the membership at large.

Any information bearing on the qualifications of these candidates should be sent promptly to the Executive Committee, P.O. Box 979, Tulsa, Okla. 74101.

Information included here comes from the AAPG membership department.

(Names of sponsors are placed in parentheses. Reinstatements indicated do not require sponsors.)

Membership applications are available at www.aapg.org, or by contacting headquarters in Tulsa.

For Active Membership

Alaska

Flight, Jennifer N., BP, Anchorage (S. Phillips, J.D. Copen Jr., R.A. Sels)

Alabama

Haywick, Douglas Wayne, University of South Alabama, Mobile (D.A. Leckie, C.E. Savrda, D.T. King Jr.)

California

Magdaleno, Edward F., DCOR LLC, Ventura (T.E. Hopps, G.J. Cavette, D.F. Lockman)

Colorado

Morgan, Paul James, Hawkley Oil & Gas, Littleton (C.P. Moyes, I. Cross, F.R. Johnson)
Yaxley, Keith Edward, Petro-Canada Resources USA, Denver (M.T. Hocker, K.T. Dean, K.Y. Macaluso)

Florida

Cox, Denise M., Storm Energy, Panama City (P.F. McKenzie, R.R. Gries, B.J. Fossum)

Mississippi

Johnson, James Clark, Energy Resources, Ridgeland (reinstate)

Oklahoma

Lains, Thomas Edward, Oklahoma Corporation Commission, Oklahoma City (reinstate)

Texas

Denne, Richard Allen, self-employed (ABX), The Woodlands, (M.J. Nault, A.E. D'Agostino, N.L. Engelhardt-Moore); Preece, Rachel, Chevron, Houston (S.K. Shepherd, J.C. Hsieh, M.L. Gerdes); Tavernier, Deanna Caroline, ExxonMobil, Houston (G.R. Bole, K.S. Tillman, M.L. Broussard); Welch, Peter W., SAIC, Houston (R.A. Welch, J. Yun, J.M. Francis); Yahi, Nouredine, Shell Oil, Houston (P.J. Brown, J.G. Stainforth, N.M. Rodriguez)

Virginia

Haynes, John T., James Madison University, Harrisonburg (P. MacKenzie, W.C. Riese, W.S. Houston); Leslie, Stephen Andrew, James Madison University, Harrisonburg (P. MacKenzie, W.S. Houston, W.C. Riese)

West Virginia

Lucas, Ian M., Dominion Exploration &

Production, Jane Lew (R.E. Goings, C.A. Edmonds, L.M. Knox)

Australia

Diamond, Brian, RPS Energy, West Perth (G.S. Simpson, J.H. Brown, C. Azalgará)

Barbados

Brathwaite, Andre Haver, Ministry of Energy and the Environment, St. George (J.R.V. Brooks, K. Latter, J.M. Green)

Canada

Copp, Gordon Joseph, EnCana, Calgary (I.D.V. Young, C. May, P.A. Esslinger); Mcllroy, Duncan, Memorial University of Newfoundland, St. John's (J.H. Macquaker, E.T. Burden, J.A. Howell)

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Okere, Alozie Davies, CGGVeritas, Crawley

(O. Olagundoye, J. Redfern, J.H. Macquaker)

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Hungary

Nemeth, Andras, MOL Hungarian Oil and Gas, Budapest (I. Berczi, D.R. Cook, J.R.V. Brooks)

Japan

Naito, Shinjiro, Mitsui Oil Exploration, Tokyo (M. Fujiwara, Y. Yaguchi, K. Moriyama)

Myanmar

Hlaing, Nyunt, Schlumberger Logelco, Yangon (Z. Wynn, H.H. Aung, J. Lingley)

Nigeria

Abba, Alhaji Sanda, NNPC-NAPIMS, Lagos (A.O. Akinpelu, M.N. Bushara, O.O. Adeniyi); Adesida, Adelola, Federal University of Technology, Akure (A.A. Adesida, V.F. Agbe-Davies, J.S. Ojo)

People's Republic of China

Zhao, Jingzhou, Xi'an Shiyou University, Xi'an (J. Dai, I.S. Al-Aasm, X. Luo)

Saudi Arabia

Al-Arakzeh, Mohammed Soud, Rawabi-Geoservices, Dhahran (J.W. Tucker, M.A. Hezam, H.A. Al-Hendi); Bridle, Ralph M., (Saudi Aramco), Dhahran (C.J. Heine, G.W. Hughes, J.W. Tucker)

Spain

Gomez Ballesteros, Ramon Felix, CEPSA, Madrid, (S.Y. Larsson, J.A. Botillo Perez, J. Navarro Comet) □

[continued from previous page](#)

Facies-Based Object Modeling and Externally Derived Attribute Histograms Put Geology Back into Geostatistics."

This year's International Distinguished Instructor is **Mark G. Rowan**, of Rowan Consulting Inc., in Boulder, Colo. He'll offer two course options:

- ✓ A one-day course on "Salt Tectonics of Passive Margins."
- ✓ A two-day course titled "Global Salt Tectonics."

Tour details will be announced as they become available in future EXPLORERs and on the AAPG Web site. For more information contact the AAPG education department. □

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READERS' forum

Climate Change Forum

I was very disturbed by the letter of Bob Shoup in the December EXPLORER, which was critical of the Climate Change Forum held in Cape Town at the recent AAPG International Conference and Exhibition.

The AAPG Executive Committee, in my opinion, is now in the precarious position of either accepting the Climate Change panel's results as AAPG's position or come out vociferously condemning the panel.

In today's economic crises the panel's vote is disastrous – already in California they are instituting new rules that will substantially raise the cost of living.

Most AAPG geologists I have talked to do not believe that humans are the major factor in global warming.

George Pichel
Oceanside, Calif.

Bob Shoup is right about a committee that won't allow any opposition. What it most likely has to hide is the truths. So it is with climate change, the arrogance of the sun's exclusive domain. It doesn't even

Editor's note: Letters to the editor should include your name and address and should be mailed to Readers' Forum, c/o AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101, or fax (918) 560-2636; or e-mail to forum@aapg.org. Letters may be edited or held due to space restrictions.

know humans exist, let alone allow them to even mess in its affairs.

Toby Elster
Wichita, Kan.

Get Busy!

We need to get off this fast track developing alternative energy, such as wind, solar and biofuels, none of which can compete with oil and gas at current prices unless heavily subsidized by the government (i.e. the tax payers).

The solution? Develop North American oil and gas reserves thought to be in abundance. Where? Deep water in the Gulf of Mexico, east and west U.S. offshore, ANWR, Alaska offshore, Canada (particularly the McKenzie Delta, which borders Alaska's ANWR) and the Arctic Circle.

Over 75 percent of global oil reserves are controlled by foreign government-owned oil companies, many of which are not friendly toward the United States. We have become entirely too dependent on this source of oil.

This dependency can be greatly mitigated, if not eliminated, by allowing our oil and gas industry freedom to explore, develop and produce oil from the above mentioned areas – particularly ANWR. Reliable estimates suggest the potential of 90 billion barrels of oil and 1,600 trillion cu. ft. of natural gas are yet to be discovered in the Arctic Circle and its adjacent land areas. With improved techniques our oil and gas industry has demonstrated capability to safely drill and produce oil and gas in environmentally sensitive areas.

Developing these reserves will provide time to develop sensible alternatives such

as clean coal, coal-to-liquid, nuclear and hydrogen. Along with these alternatives, conversion of our land-based transportation (i.e. cars, buses, trucks) to compressed natural gas usage is quickly and economically doable, reducing our dependency on imported oil by approximately 20 percent.

Coupling this with our existing infrastructure (designed to accommodate oil and gas delivery and usage) avoids the huge expense of subsidies and construction of new infrastructure to accommodate alternative energy generated by wind, solar, biofuels, etc.

Finally, the issue of global warming: The key word is cause. No doubt we are experiencing change, but the cause may be more nature at work and less man-made. This negates man's ability to reverse, or end, global climate change. Hence, even more reason to pursue the above solution (i.e. develop our own oil and gas).

Time is of the essence!

Dick Baille
Houston

Winter Conference
Coming to Houston

AAPG's popular Winter Education Conference, offering five days of quality geosciences training, will be held Feb. 9-13 at the Norris Conference Center in Houston.

Registration fees – reduced if enrolled by Jan. 12 – cover all four concurrent sessions, lunches and course notes.

To register, or for more information, go to <http://www.aapg.org/education/wec.cfm>, or contact the AAPG education department at educate@aapg.org.

SPOTLIGHT on...

An aggressive outreach effort by the Roswell Geological Society, supported in part by the AAPG Foundation, reached over 350 persons and resulted in the raising of over \$56,000 to fund scholarships and further education efforts.

With a theme of "Educating Today's Youth and Tomorrow's Leaders," the Roswell Society partnered with the New Mexico Landmen's Association and the Desk and Derrick Club to sponsor several activities.

The effort's centerpiece was a presentation by AAPG member Lee Gerhard on the "Geological Perspective of Global Climate Change," which attracted over 230 persons to a dinner and about 100 students and teachers from five area high schools to an afternoon presentation.

The AAPG Foundation provided funds to present students with two booklets and a wall chart related to Gerhard's presentation, as well as H.

Leighton Steward's book *Fire, Ice and Paradise* (October EXPLORER). Local libraries and teachers were given a copy of AAPG Studies #47 *Geological Perspectives of Global Climate Change*, edited by Gerhard.

Past AAPG president Edward K. David, of Roswell, said the funds raised by the effort were shared equally for the scholarship funds of the sponsors, plus two non-profit education organizations that operate statewide.



ENERGY / ENVIRONMENT / EDUCATION

Tulsa Geological Society
The 5th Annual **E³** Technical Conference
A series of short courses for students
and professional geologists
Oklahoma State University - Tulsa, Conference Center

Kick-off Dinner
Tuesday, February 17, 2009

Full Day and Half Day Classes
Wednesday, February 18, 2009
and Thursday, February 19, 2009

For detailed information and registration please see
www.tulsageology.org.

UPCOMING
REGIONAL WORKSHOPS

1/21-22 **Rocky Mountain**: Basic Openhole Log Interpretation - Golden, CO. Contact: 303-273-3107

2/5 **Midcontinent**: Evaluating O&G Reserves and Economics in an Uncertain Time - Wichita, KS. Contact: 785-864-7396

2/9-10 **Texas/SE New Mexico**: Applied Geoscience Conference: U.S. Gulf Region Mudstones as Unconventional Shale Gas/Oil Reservoirs (Houston Geological Society, AAPG Energy Minerals Division) - Houston, TX. Contact: 512-471-0320

2/16 **Rocky Mountain**: Hydraulic Fracturing; Measurement, Characterization and Analysis - Golden, CO. Contact: 303-273-3107

2/18 **West Coast**: 2D/3D Mapping - Long Beach, CA. Contact: 661-635-0557

2/19 **West Coast**: 2D/3D Mapping - Bakersfield, CA. Contact: 661-635-0557

2/23 **Rocky Mountain**: Source Rocks 101; What the Exploration Geologist, Geophysicist and Production Engineer Should Know About Petroleum Source Rocks - Golden, CO. Contact: 303-273-3107

2/26 **Midcontinent** "Pumpers" workshop - Russell, KS. Contact: 785-864-7396

2/TBD **Texas/SE New Mexico**: How To Start/Fix/Manage a Small Waterflood - Farmers Branch, TX. Contact: 512-471-0320

For further information, view PTTC's online calendar at www.pttc.org/national_calendar.htm

“hydrothermal dolomite” AND Davies

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 Pacific Section AAPG Special Publications
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Calgary, Alberta	April 27 – May 1
Denver, Colorado*	August 17 - 21
Calgary, Alberta	September 28 – October 2
Houston, Texas	October 19 – 23

An Overview of Exploration Play Analysis

Houston, Texas* May 4 – 5

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* includes material on unconventional resource assessment

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Hires in Energy Geoscience
Jackson School of Geosciences
The University of Texas at Austin

The Jackson School of Geosciences is expanding its program in Energy Geoscience by seeking outstanding scientists able to collaborate across disciplines and having expertise in one of the two following fields:

- **Rock mechanics or rock physics.** This research could be applied to exploration and development of unconventional hydrocarbons, the role of fluids in natural rock deformation, or improving seismic modeling. Approaches include experimental determination of stress-strain relations, microacoustic properties of stressed rocks, or the relationship of rock properties to their seismic P- and S-wave response.
- **Interpretive reflection seismology.** This research on sedimentary basins at either basin-scale or reservoir-scale would use industry or academic 2D and 3D seismic data. We seek individuals to span the gap between detailed mapping of

seismic data and theoretical analysis to improve understanding of reservoir systems or sedimentary basins and their hydrocarbon systems.

Appointments include both faculty and research scientists. However, we are particularly interested in those seeking research scientist positions in either the Bureau of Economic Geology or the Institute for Geophysics. For more information on the school and its hiring program, visit us online at www.jsg.utexas.edu/hiring.

A Ph.D. is required at the time of appointment. An application should note the title of the advertisement you are responding to and include a cover letter, CV, list of publications, list of references, statements of research and/or teaching interests, sent to Randal Okumura, Office of the Dean / Jackson School of Geosciences, The University of Texas at Austin / PO Box B, University Station / Austin, TX78713 or jobs@jsg.utexas.edu.

THE UNIVERSITY OF TEXAS AT AUSTIN IS AN AFFIRMATIVE ACTION / EQUAL OPPORTUNITY EMPLOYER.

GRADUATE STUDENT OPPORTUNITIES

Chevron Center of Research Excellence (CoRE)
Department of Geology and
Geological Engineering
Colorado School of Mines
Golden, CO

CoRE is seeking applications from graduate students in Geology (MS and PhD) interested in outcrop-based stratigraphic research.

CoRE research projects include intensive field studies in:

- Outcrops of several deepwater systems around the world, and
- Reservoir analogs of fluvial and shallow marine systems.

Funding package includes tuition, fees, insurance, and field expenses.

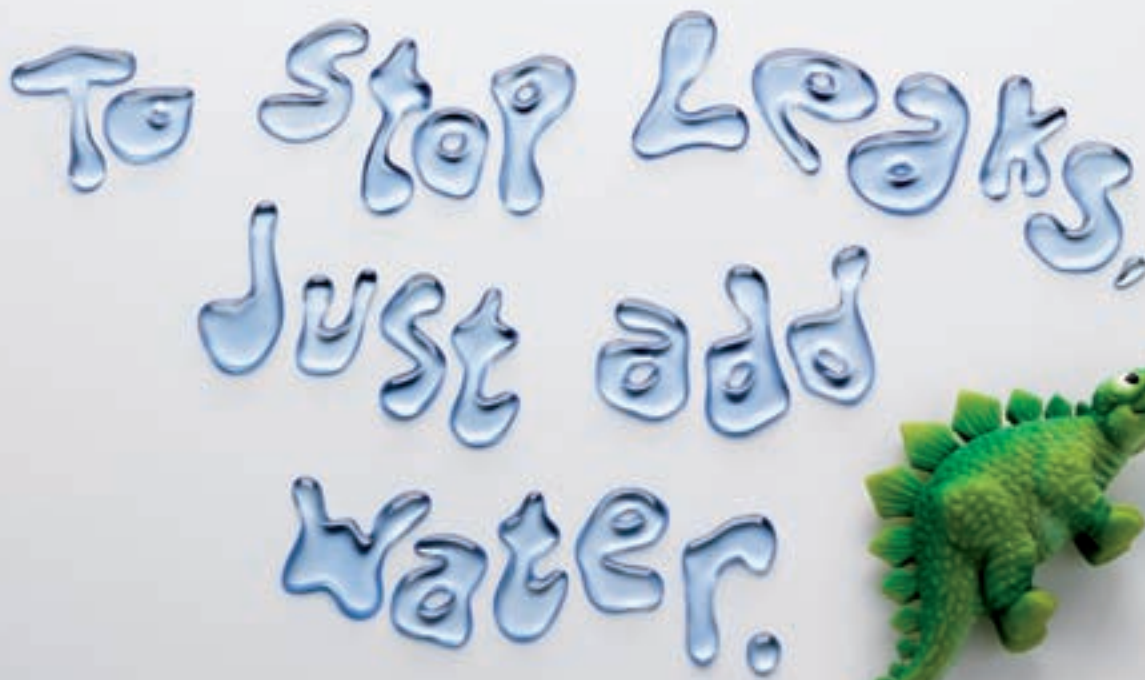
Please contact Charlie Rourke (crourke@mines.edu) or David Pyles (dyles@mines.edu) for more information regarding potential research projects and application process for this program.

The **Wyoming Oil and Gas Conservation Commission (WOGCC)** is recruiting for a State Oil and Gas Supervisor. This is an at-will position that serves as the Executive Head of WOGCC, in Casper, WY. Incumbent will direct all work activities that regulate the petroleum industry and its operations within the State and confers with the Commission and Governor on recommended policy changes and plans. This individual must be a Registered Petroleum Engineer or a Petroleum Geologist. The hiring range is \$130,000 - \$150,000 per year dependent upon qualifications. For more information visit: <http://statejobs.state.wy.us/JobSearchDetail.aspx?ID=14775> or call (307) 777-7188. To apply: email a cover letter, resume and references to Oil and Gas Supervisor Search Committee at STJobs@state.wy.us or fax (307) 777-6562 along with transcripts of any relevant course work. Please be sure to reference Class Code D000-14775. Open Until Filled. EEO/ADA Employer.

Geochemistry
The University of Tulsa

The Department of Geosciences invites applications for a tenure-track faculty position at the Assistant or Associate Professor level. A Ph.D. degree in geosciences or related field with demonstrated experience in geochemistry is required. We seek an individual who shows the potential for outstanding achievement in research and teaching. The successful candidate will be expected to teach courses at the undergraduate and graduate levels, and establish an externally funded research program. Preference will be given to candidates with experience in petroleum systems science, and/or basin modeling and modeling of rock fluid interaction associated with basin evolution, although other specialties will be considered. Interdisciplinary research with existing Petroleum Engineering, Petroleum Geoscience and Environmental Science programs is encouraged. The University of Tulsa is a private, comprehensive university, and is a premier doctoral granting research institution committed to excellence in teaching, creative scholarship, and service to the University and community. The University is located within 100 miles of two major industry research labs. The city of Tulsa has a vibrant geological and geophysical community, and is home to the international headquarters of the American Association of Petroleum Geologists, Society of Exploration Geophysicists, and the Society for Sedimentary Geology. The Department of Geosciences hosts an array of analytical equipment, and has strong computing capability with all of the major, industry standard software packages. The University offers competitive salary and benefits packages. Minorities and women are encouraged to apply.

Send a letter of application stating research and teaching interests; curriculum vita, and name and



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- **GOM Exploration Geologist - Houston, TX (U15543)**
- **GOM Exploration Geologist - Paleogene - Houston, TX (U15520)**
- **Senior Geoscientist - Subsalt Interpreter - Houston, TX (U14063)**
- **Onshore US Geoscientist - Shale Gas - Houston, TX (U15519)**

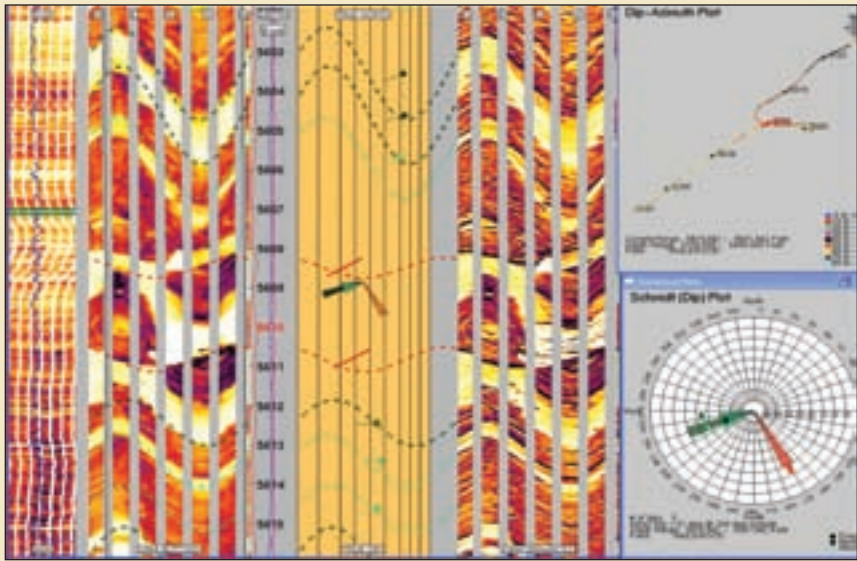
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continued on next page



Correction: The above photo, which originally ran on page 14 of the December EXPLORER, was the right image for the story but the wrong photo information. The correct caption should read:
Highly fractured interval interpreted as a fault zone extending from 5603 to 5613. Note the offsets visible at 5608.5 and 5610.5. Dips on these surfaces are 25-30 degrees; strikes are about N70E.

continued from previous page

contact information for three references to Dr. Peter Michael, Department of Geosciences, The University of Tulsa, 800 South Tucker Drive, Tulsa, OK 74104-3189. Please direct inquiries to: pjm@utulsa.edu. Application review will begin immediately and continue until the position is filled. The University of Tulsa does not discriminate on the basis of personal status or group characteristics including but not limited to the classes protected under federal and state law. The University of Tulsa is an EEO/AA employer.

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Assistant or Associate Professor in Hydrocarbon Geoscience



GEOLOGY & GEOPHYSICS DEPARTMENT AND ENERGY & GEOSCIENCE INSTITUTE, UNIVERSITY OF UTAH



The Geology and Geophysics (GG) Department and the Energy & Geoscience Institute (EGI) at the University of Utah invite applications for a tenure-track faculty position in GG at the Assistant or Associate Professor level, beginning July 1, 2009. The successful candidate will bring expertise in hydrocarbon energy research and will develop a strong, externally funded and internationally recognized research program involving students and industry. Teaching responsibilities will include development of new undergraduate- and graduate-level courses and integration with existing courses in GG's Petroleum Industry Career Path. The appointee will participate in collaborative efforts between GG and EGI. The GG Department and EGI share thriving research and academic programs in petroleum geology and geophysics and allied areas of the geosciences, including EGI's Corporate Associate program. The position will have offices at both organizations, and communication and leadership skills as well as teamwork experience are important. We also offer state-of-the-art facilities including the new Frederick A. Sutton Building. More information can be found online at www.earth.utah.edu and www.egi.utah.edu.

The area of specialization is open but possibilities include geologic interpretation of geophysical data, new methodologies for subsurface imaging, petrophysics, rock fracture mechanics, reservoir characterization and engineering, multiphase fluid flow, and geostatistical modeling. Multiple opportunities for collaboration and funding exist, including capitalizing on emerging interest in unconventional resources.

Candidates must have a completed Ph.D. at the time of appointment and a strong record of research and publication. Applications are being accepted now; review of applications will begin on January 15, 2009, and will continue until the position is filled. Applicants should submit an application letter indicating research, teaching and programmatic interests and agenda, curriculum vitae, and names and contact information of three professional references to:

Chairs of the Hydrocarbon Geoscience Search Committee
Geology and Geophysics Dept., University of Utah
135 South 1460 East, WBB 719
Salt Lake City, UT 84112

Complete applications may also be sent in PDF format by email to Kristin.Christensen@utah.edu. Questions can be addressed to Cari Johnson (Cari.Johnson@utah.edu) or Ray Levey (RLevey@egi.utah.edu).

The University of Utah is an equal opportunity/affirmative action employer, encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees.

The University of Utah values candidates who have experience working in settings with students from diverse backgrounds, and possess a strong commitment to improving access to higher education for historically underrepresented students.

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Closing date: 25th February 2009

Ref: 2783/AAPG

Further details of the post and an application form are available on our website (<http://jobs.dur.ac.uk>) or telephone 0191 334 6501; fax 0191 334 6504



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HOUSTON

We seek persons with experience in business development using geoscience software applications to demonstrate the value of next-generation 3-D geological interpretation workflows. Strong interpersonal communication and presentation skills would be highly advantageous.

Software Developers

AUSTIN / HOUSTON

Positions exist for software developers interested in working on highly interactive 3-D graphics applications. The successful candidate should have experience with OpenGL and/or QT user interfaces.

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AGM Inc. is a rapidly growing company, focused on the global deployment of Recon, the industry's leading 3-D geological interpretation software. We are seeking to fill positions in Houston, Austin and London.



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DIRECTOR'S CORNER

Why Do We Do Things That Way?

By RICK FRITZ

Last year was an amazing year in many ways – from the economy to the price of oil to security issues around the world. I am beginning to agree with George Bernard Shaw's saying that "everything happens to everyone sooner or later if there is time enough."

Along those lines it has been a very busy and productive year for AAPG:

✓ We have had great success with our Foundation fundraising campaign.

✓ The AAPG leadership is making successful strides into globalization.

✓ AAPG's membership is growing – along with our products and services.

* * *

One of the brightest spots for AAPG has been the Foundation financial campaign. Thanks to the hard work of the Foundation leadership and staff we are now approaching \$25 million in actual and pledged donations.

I wish to thank all of you who have participated with pledges – and thank all of you in advance for considering a pledge to campaign.

I especially thank the Foundation Trustees and the members of the Financial Campaign who led the way with their generous pledges (see



Fritz

The AAPG Foundation Trustees and members of the Financial Campaign who led the way in 2008 with their generous pledges were:

- ☐ Trustees **Bill Fisher, John Amoroso, Jim Gibbs, Bill Gipson, Bill Barrett and Marlan Downey.**
- ☐ Campaign co-chairs **Larry Funkhouser and Jack Threet.**
- ☐ Campaign team leaders **Bob Ardell, Bill Crain, Mike Party, Ed Picou and Marta Weeks.**

accompanying box).

Other highlights of the year include:

✓ The lead gift from **Austin and Marta Weeks**, which along with other generous contributions has allowed the AAPG Foundation to increase grants-in-aid to students and help build our student programs.

✓ Thanks to generous donations from **John Bookout, Bill Barrett** and other Trustee Associates we have increased our support of providing instruction to K-12 teachers on geoscience through the Rocks in Your Head programs and other venues.

✓ The **Boone Pickens'** donation has started a new Geoscience GIS Consortium at Oklahoma State University, and we will start seeing products from this consortium this year. We are in discussion with other schools about starting similar programs through the Foundation.

✓ Promoting professional development and enrichment, Trustee Associate **David "Scotty" Holland** established the AAPG-Holland Award of Excellence at Hardin Simmons University in Abilene, Texas.

✓ One of our most successful programs is providing digital geology to students and faculty through the Foundation Digital Products Fund. Nearly 50 universities

around the world now have access to the entire Datapages library through this program.

* * *

The end of a year always marks a time for reflection and change, and the just-ended December was no different. We are currently considering a new corporate structure for AAPG that will develop a better worldwide business model with a stronger liability shield.

In addition, the new structure will allow the leadership and staff to work more efficiently with both the Sections and the Regions.

Anytime you are considering change, you always have to ask yourself "why do we do things that way?"

Sometimes the answer reminds me of a story I heard about a child who was watching the mother cook a roast. The mom cut off both ends of the meat and placed it in a big pot for cooking.

When the child asked, "Why do you cut off each end?" the mother replied, "I do it because my mother did it that way, so it must make the meat taste better."

When the child asked, "Why does it

make the meat taste better?" their mother replied, "I don't know, go ask your grandmother."

When the child asked the grandmother she replied, "I do because my mother did it that way, so go ask your great-grandmother."

When the child asked the great-grandmother why she cut off each end of the meat, she replied, "I do it because my pot is too small."

In any case, we are examining our past processes – good and bad – and future needs in developing this new corporate structure.

This new year it will be deliberated by the AAPG Executive Committee, the House of Delegates, the Advisory Council and the membership at large before it is brought to the annual meeting for consideration.

We believe it will be a key item this year in improving and making a stronger Association.

* * *

Finally, thanks again for your continued support of the Foundation programs and the many hours of labor you give in building AAPG's services worldwide.

I wish all of you a very happy New Year!

DPA certification

It's All About Professionalism

By RICK L. ERICKSEN
DPA President

What does the DPA stand for?

In one word – professionalism!

Since 1965, when the Division of Professional Affairs was formed, the term professionalism equates to membership in the Division and strict adherence to the AAPG's Code of Ethics as found in Article IV of the AAPG's Constitution.

The DPA is the only professional organization – at least in the United States – that specifically certifies petroleum geologists and geophysicists and coal geologists, i.e. energy resource geoscientists. With regard to its certification charge, to be a certified professional geologist, geophysicist or coal geologist, the DPA (through its Certification Committee, chaired by Royce Carr) verifies an applicant's credentials for CPG that provides assurances to employers, clients, governmental entities and the general public that those who profess to be energy resource geoscientists are so qualified based on documented verification of educational credentials, work history/experience and character references provided from multiple sources.

But even with that certification there are ongoing responsibilities that go along with being a CPG.

Sure, you have jumped through the hoops to get your university education in the geosciences and you have obtained the requisite geoscience work experience to become a certified energy geoscientist – but just reaching those plateaus doesn't mean that you can stop learning, stop



Ericksen

participating in and with professional organizations nor otherwise rest on your laurels.

* * *

Another critically important aspect associated with competent professional practice and certification is ethics.

Over the past several years we all have seen and read about deviations from ethical thinking and ethical practices – I need not mention the names or unethical activities, we all know who, where and when they occurred.

The topic of ethics has become more and more of an issue, especially now with the meltdown of the worldwide economies and the questionable financial practices that have led up to the meltdown. We geoscientists need only look around and see the dismal ethical performance of other professions and the individuals who call themselves "professionals" in those sectors.

With that said, it is now more important than ever to produce geoscience reports, maps and other work products that meet the highest standards of competency.

Further, it is important to note that where those work products contain varied degrees of interpretational conclusions or inferences that they be explicitly noted – and perhaps even further grounded with some type of limitations – to ensure that those interpretations cannot be



misconstrued by anyone.

Echoing other DPA presidents, I must note that it also is important and essential:

- ✓ To maintain our confidences with employers/clients.
- ✓ To respect the work of other geoscientists, even though you may not personally agree with them.
- ✓ To avoid any potential of conflict of interest.

On a personal note, I am primarily employed by an agency of state government where, believe it or not, the bar of conflict of interest may be considered to be somewhat higher than other business sectors based on the continued demand by the public for transparency. Per some state-based conflict of interest laws, an individual shall not be involved in matters that are in black and white shades of conflict of interest – but some of these laws go a step further.

Specifically, some state laws specify that the individual (government employee) shall not be involved in activities that even "give the appearance of a conflict of interest."

Perhaps that's a high bar ethically speaking, but it's one that each of us should carefully consider before entering into any professional endeavor.

Also critical to the professional practice of the geosciences is to know when an issue is beyond our expertise or when a particular issue or activity may be in an area of professional practice that we may be minimally qualified to address.

When those circumstances arise the geoscientist should either not accept the assignment, or inform the client/employer that s/he (the geoscientist) is minimally qualified prior to accepting that work.

In other words, when we professionals reach such a juncture the red flags should go up, both internally and externally.

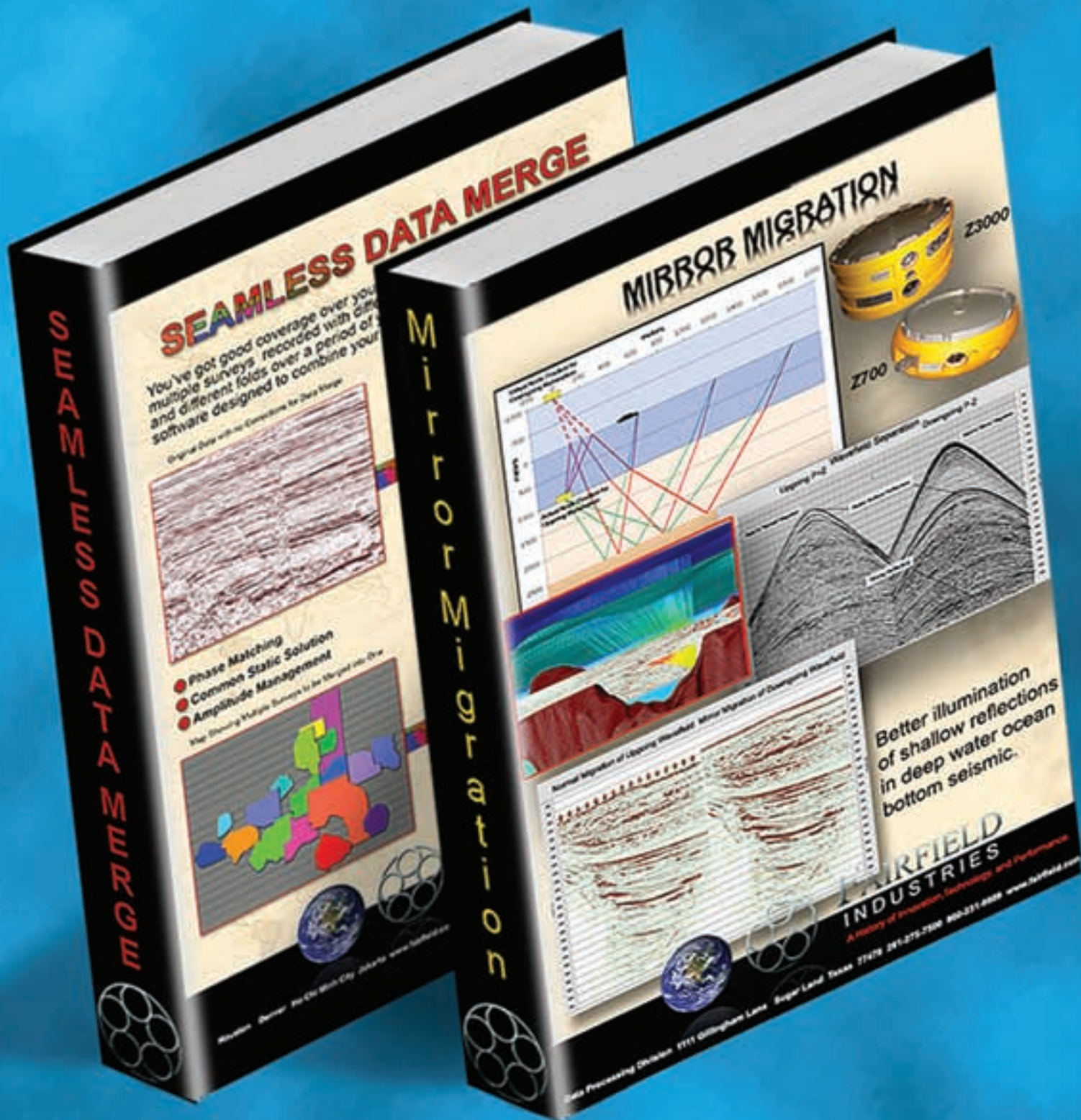
* * *

With that said, consider certification and membership in the DPA – besides being a resume builder, belonging to DPA provides you with:

- ✓ A voice in government affairs.
- ✓ Membership benefits that include a legislative tracking service.
- ✓ Networking with your peers.
- ✓ Accessibility to short courses at discounted prices.
- ✓ Online ethics courses.
- ✓ Access to the DPA's excellent quarterly newsletter, which contains articles covering a wide spectrum of topics from current geoscience and related area hot button issues to hands on mapping/interpretational problem solving.

Until next time. ☐

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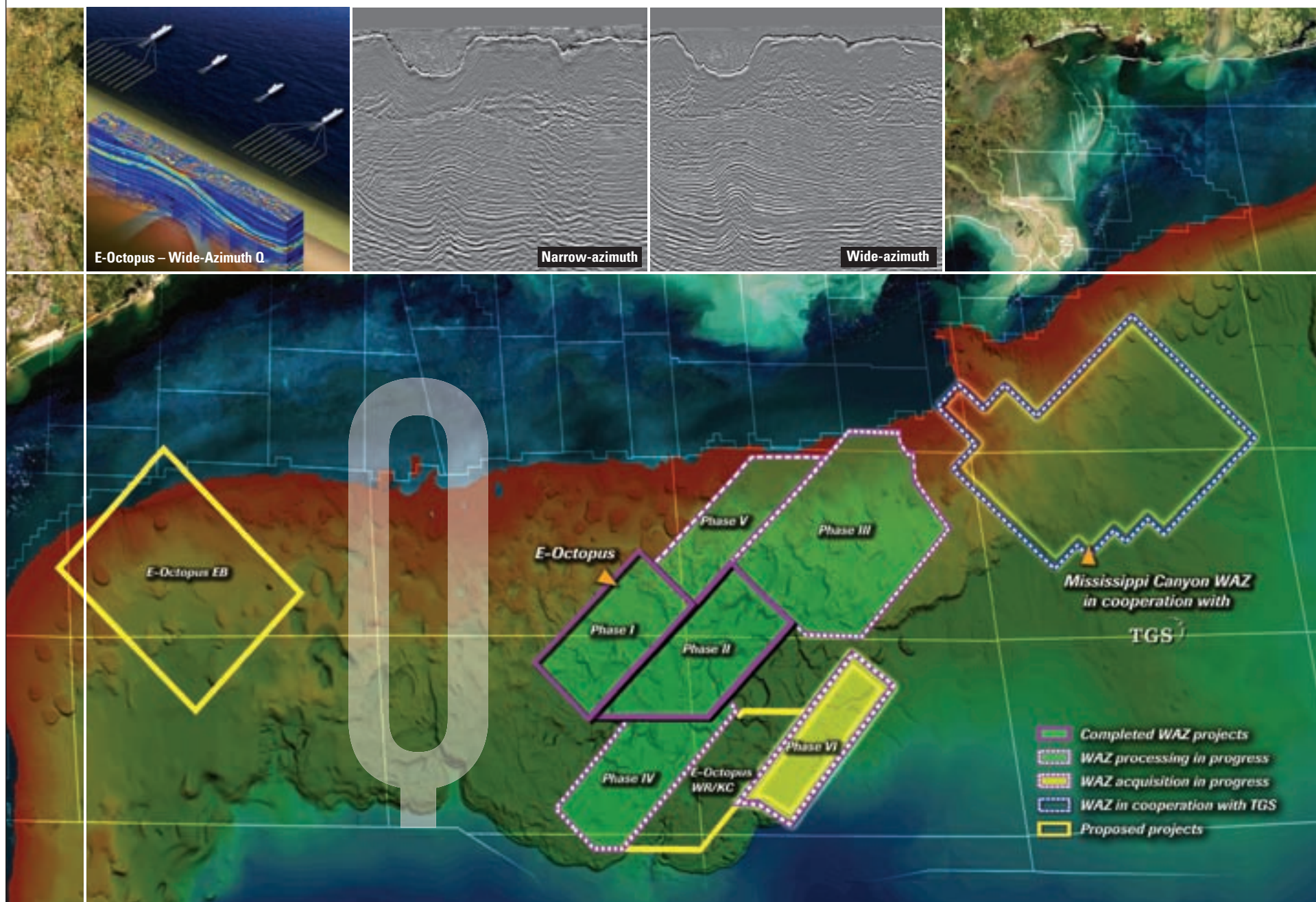
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