

AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

# EXPLORER

SEPTEMBER 2008

GULF COAST  
2008



## It's Show Time

Gulf projects join the production line

See page 6





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**On the cover:** It's been a long time coming, but BP's much anticipated Thunder Horse is about to become an important asset in the Gulf of Mexico – as are several other projects in both the shallow and deepwater regions of the Gulf. In fact, the Gulf's storied history of providing energy for the country is about to get a new chapter as several projects with great potential begin to come online – a story that is a highlight of our annual Gulf Coast issue. See story, page 6. Photo courtesy of BP.

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## PRESIDENT'Scolumn

# Energy, Economy And Environment Linked Together

By SCOTT W. TINKER

In my August column I discussed the bridge between energy and the economy. Another key bridge for AAPG, and one more difficult to construct intellectually, is the link between energy and the environment.

I consider myself an environmentalist. Many geologists are.

To me that means I am awed by the beauty of nature – from the tenacity of the desert to the majesty of the mountains to the magnitude of the sea. I spend time out-of-doors, tread as lightly as I can and try to leave places better than I find them. I contribute financially to certain environmental concerns. I attempt to minimize my environmental footprint given the available technological options (such as installing fluorescent bulbs throughout the house; my seven-year-old daughter concluded correctly, “Gee Dad, this won't pay out!” And yet we all felt better!) and to the extent I can afford.

*To the extent I can afford?* What does that mean?

The energy-environment bridge is built on an economic foundation. Energy is required for a healthy economy, and a healthy economy is requisite to a clean environment. Said differently, in a global or national recession, not much is invested in the environment; we have other issues and concerns to deal with that are more pressing. The economy-environment link, however, may not be widely understood.

Today's energy debate is often framed as a choice between fossil fuels and non-fossil fuels, or between fossil fuels and the environment. These are red herrings.

In fact, a healthy U.S. and global economy allows for substantial investment in our environment. And a healthy economy requires energy.

A stable and continuous supply of fossil fuels is needed while we develop and expand alternative fuels – for our economy and for the environment.

\* \* \*

Fossil fuels, alternate energy, the economy and the environment are not mutually exclusive choices. They are inextricably linked. They are symbiotic.

But wait, aren't fossil fuels bad and wrecking the environment?!

There was a time when production of fossil fuels had a major impact on the surface of the Earth. However, understanding has advanced and technology has evolved and improved dramatically:

✓ Complex horizontal-well configurations allow thousands of subsurface acres to be accessed from a 10-acre onshore pad or offshore platform.

✓ Pipelines and gas-gathering systems are automated and efficient so that liquid and atmospheric releases are more readily detected and more rapidly mitigated.

✓ Marine production and transportation systems of liquid and natural gas fuels are designed to react to natural disasters such as hurricanes and even earthquakes.

✓ Reclamation of coal-mining operations results in land that resembles native conditions much more closely than did the pre-mining landscape.

U.S. Gulf Coast hurricanes Katrina and



Tinker

Rita were devastating natural disasters. However, the greatest environmental story of the decade in terms of oil and gas was the one that followed Katrina and Rita. No major spills or leaks from offshore operations – the environmental disaster that wasn't! Too bad

major media outlets did not see fit to run that story.

So here we sit today with oil and natural gas resources off every U.S. coast – Arctic, Atlantic, Pacific, Gulf – under drilling moratoria on the false pretense that drilling hurts the environment.

Yes, there have been accidents – accidents happen whenever humans and large-scale technology come together. Those accidents grow fewer with each passing decade as technology and knowledge advance. Accidents are part of our world, and just as they happen with oil

**Today's energy debate is often framed as a choice between fossil fuels and non-fossil fuels, or between fossil fuels and the environment. These are red herrings.**

and natural gas, they will happen with wind and solar systems when these are developed and deployed at the massive production scales needed to make an impact. Accidents are never good, but they are relatively rare.

The greater disaster, and one that is no accident, is continuing policies that impose drilling moratoria that forbid us to develop our own fossil energy resources – resources that would allow us to build a stable economic bridge to an alternate energy future.

The unintended consequence of this misplaced policy is harming our economy and, consequently, reducing the level of investment in our environment.

As an environmentalist, I find this unacceptable.

\* \* \*

As in August, let me conclude in a similar way this month, but expand: The next time you meet someone and are asked, “What do you do?” tell them you are a geologist and an environmentalist in the oil and gas business.

Let them know what that really means. Put a human face on our global energy, economic and *environmental* future!

We are the bridge.

*Scott W. Tinker*



# Offshore Oil Slicks

In offshore areas such as the deepwater Brazil, West Africa and the Gulf of Mexico, it's not uncommon for oil emanating from source rocks to bypass natural trapping mechanisms and leak upward to the seafloor. In addition, considering that natural seals sometimes are flawed, entrapped oil may also rise to the surface via such conduits as fractures and faults. Identifying these natural seeps can prove invaluable to explorers looking for indications of a hydrocarbon source in frontier exploratory areas.

Natural oil seeps and high-resolution geochemical methods have historically provided invaluable information to oil explorers in frontier areas for assessment of lease and exploration basins. Foremost, they indicate the presence of active generative hydrocarbon source rocks, without which there can be no hydrocarbon accumulations.

Oil seep evaluation in the pricey, high-risk deepwater environment can provide an array of crucial information to oil and gas explorations.

The high cost of offshore deep and ultra-deepwater exploration has made the identification of oil slicks and seeps a well-accepted risk assessment methodology in offshore basins all around the world. In fact, the combination of high resolution geochemical methods, oil slicks and oil seeps can provide clues regarding hydrocarbon origin, types and age, and thermal evolution of the source rocks.

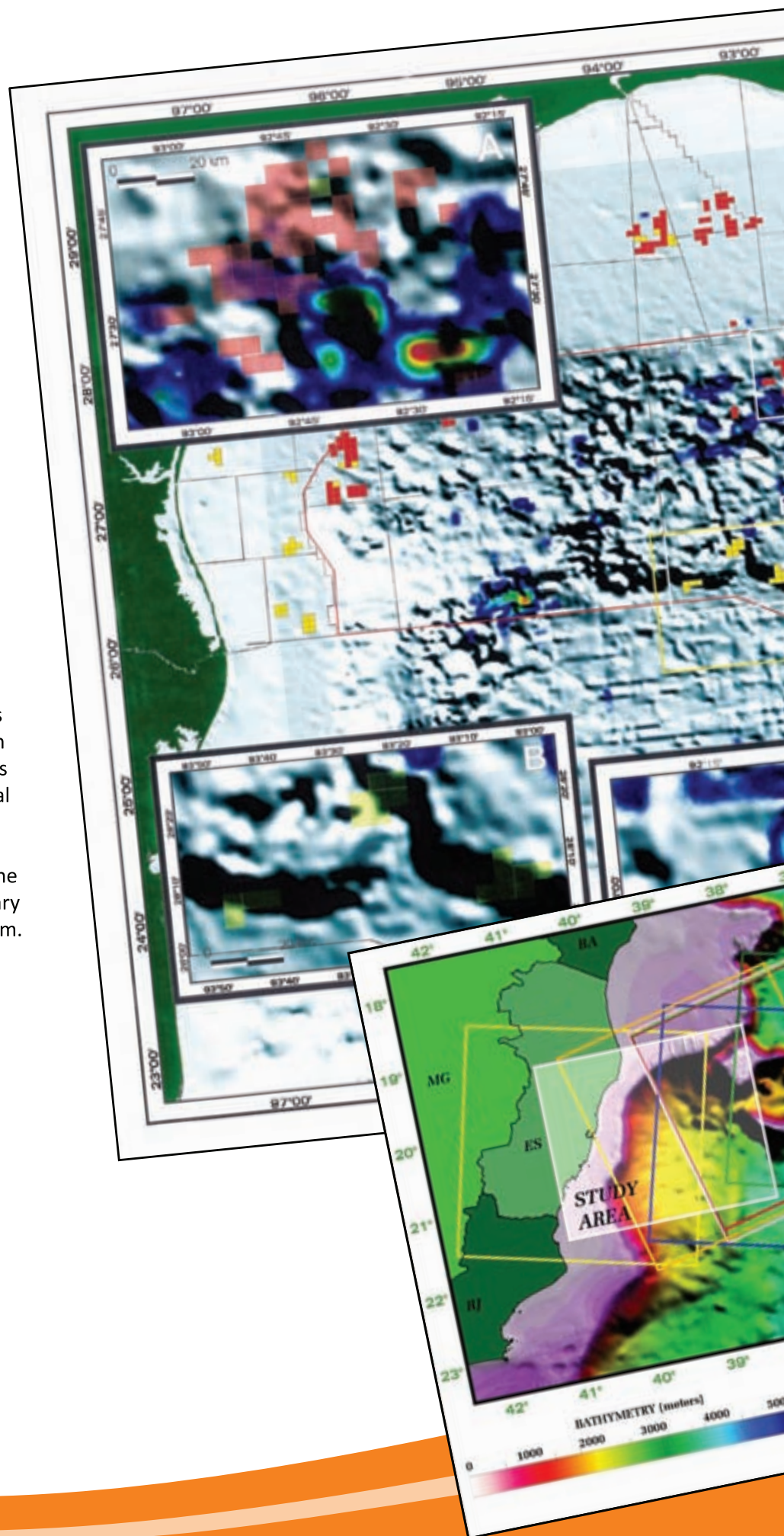
It is very important to emphasize that the identification of the natural oil slicks in deep and ultra-deep water in any sedimentary basin is a proof of the presence of an active source rock system. Without such a system, no oil accumulation can occur.

For further information on HRT's Offshore Oil Slick studies, please contact:

*Marcio Rocha Melo, PhD. (marcio@hrt.com.br)*

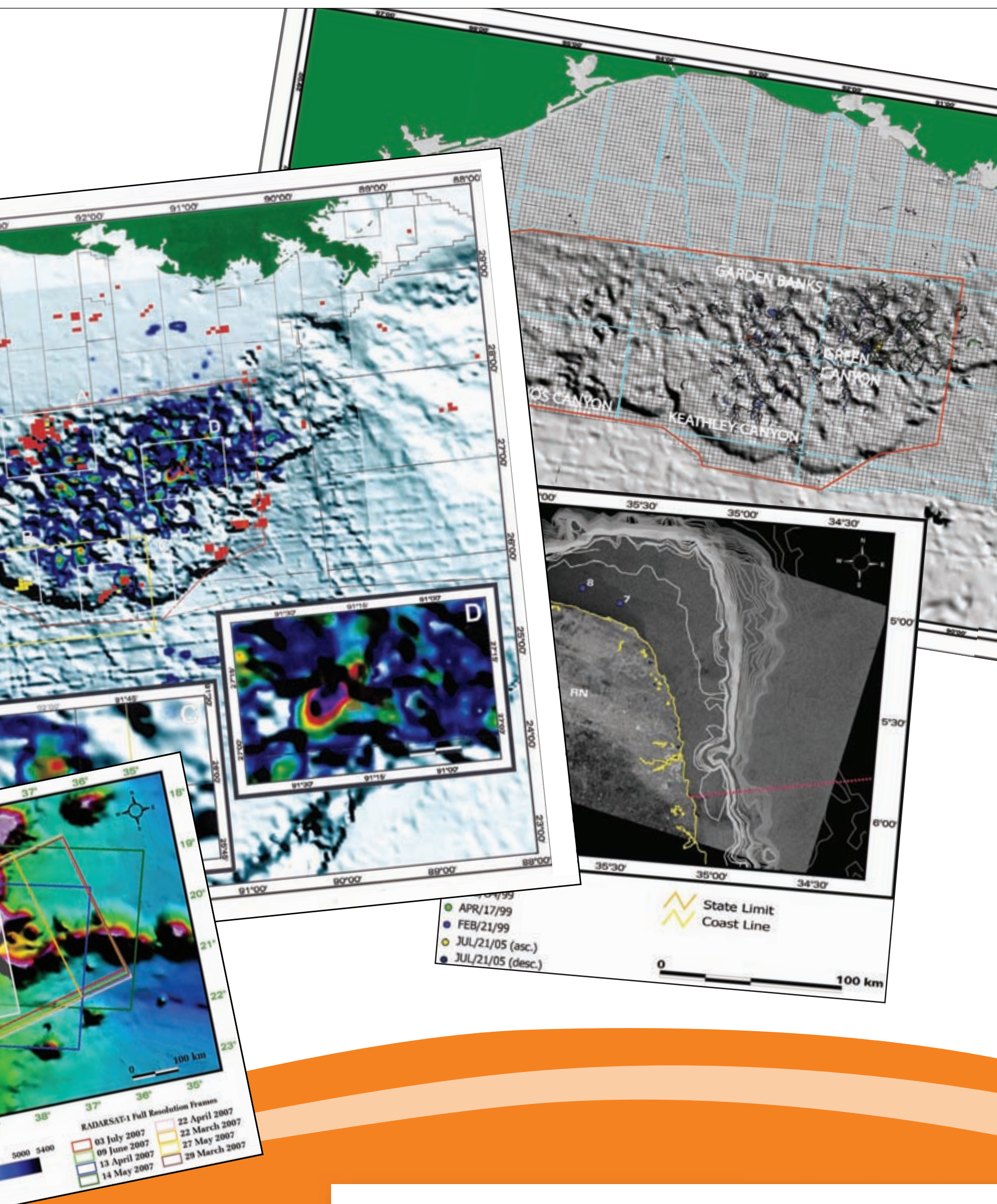
## Related Studies:

- Gulf of Mexico
- Santos Basin
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*Flowing to the rescue*

# New GOM Production Coming Online

By DAVID BROWN  
*EXPLORER Correspondent*

Here comes oil production from some big-name field developments in the Gulf of Mexico.

Just in time.

✓ **Thunder Horse**, the giant BP-operated field 150 miles southwest of New Orleans, reportedly recorded 40,000 barrels-per-day production in July and was expected to reach its capacity of 250,000 b/d in late 2009.

The field also is projected to produce 200 million cubic feet of gas per day and will be the biggest producer in the GOM when it hits full stride.

✓ **Atlantis**, which began production in the fourth quarter of 2007, has an ultimate producing capacity of 200,000 b/d and 180 million cf/d. The field is owned 56 percent by BP and 44 percent by BHP Billiton.

✓ **Tahiti**, Chevron's huge Green Canyon find 190 miles offshore, should come onstream in the second half of 2009. The field's production facilities are expected to have a daily capacity of 125,000 barrels of oil and 70 million cubic feet of gas.

And that's not all. Production platforms are going up or are in preparation all over the deepwater Gulf.

It's just about impossible to overestimate the importance of this new production to the world oil supply picture, and especially to North America.

Field declines in Mexico and the United



*Photos courtesy of BP*

Workers are keeping busy in the Gulf of Mexico, where several big-name developments – including the much anticipated Thunder Horse – are about to begin production.

States – read Cantarell and Alaska – put North America in a terrible position for oil production and consumption.

But the latest production outlook from the Energy Information Administration (EIA), released in July, projects U.S. production rising from 8.40 million b/d in the second quarter of 2007 to 9.03 million b/d in the fourth quarter of 2009.

This deepwater-fed production jump is

part of a worldwide trend.

Brazil's success offshore might let it blow away the EIA's projected increase from 2.34 million b/d at the end of last year to 2.96 million b/d at the end of 2009.

Africa and the Asia and Oceania region could add at least another 500,000 b/d by 2010, again boosted by offshore discoveries and production.



## One Hot Area

In a world of hot offshore exploration, the Gulf of Mexico remains one of the very hottest areas.

"The number of rigs capable of drilling in deepwater in the Gulf is increasing and the number of wells we're able to drill in deeper waters is also increasing," said AAPG member Dave Marin, supervisor of resource evaluation for the U.S. Minerals Management Service Gulf of Mexico region in New Orleans.

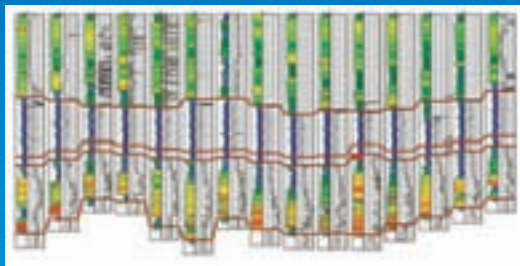
"The Lower Tertiary is still the focus in the ultradeep water. Second to that is gas in the shallower waters in connection to the Independence Hub," he added.

Independence Hub started gas production in mid-2007 and has a capacity of one billion cf/d. The project, which covers about 1,800 square miles will account for 10 percent of the gas produced from the Gulf.

See **GOM**, page 8

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September 2008

## Midland Valley Structure World

September's column is dedicated to our eagerly awaited Silver Anniversary Technology Meeting taking place at the Glasgow Science Centre, 30th September & 1st October. The meeting will be all about Structural Geology. Our speakers from industry and academia will be presenting on a range of topics. Presentations include:

**Professor Jan Kees Blom, Delft University**

**The use of Move software in B.Sc. Geology Education, with examples.**

**Dr Tim Buddin, BP**

**Life-of-field structural interpretation & modelling under uncertainty: a BP perspective.**

**Professor Rob Butler, University of Aberdeen**

**Fold Thrust Structures: Challenges and Styles.**

**Professor George Davis, University of Arizona**

**Character of thrust faulting, folding, and outcrop-scale deformation in the Pindos belt, as revealed through detailed structural geologic mapping of the Sanctuary of Zeus, Mt. Lykaion, the Peloponnese.**

**Professor John Dewey, University of California at Davis**

**The difficult and complex relationship between thermo-mechanical modeling and field mapping in tectonics and structural geology.**

**Dr Brett Freeman, Badley Geoscience**

**Reservoir structural mapping: the key to effective prediction.**

**Dr Ken McCaffrey, University of Durham**

**New high resolution reservoir analogues: using 3D/4D Move to integrate structural mapping and lidar dataset.**

**Dr Matteo Molinaro, Shell**

**2D structural restoration and validation in Algeria using poor (2D) seismic data.**

**Dr Andy Newson, Moose Oils**

**Adding Reserves in Mature Fields by using Balanced Cross Sections, an Example from the Canadian Foothills.**

**Ryan Shackleton, University of Massachusetts**

**Structural restoration and stress/strain prediction using a hybrid geomechanical approach - Application to the Santa Corelli.**

**Dr Bjorn Wygrala, IES - Integrated Exploration Systems**

**New Workflows for Exploration Risk Assessment Tools.**

### BREAKOUT SESSIONS

There will also be plenty to do during the refreshment breaks over the two days:

- Visit our 'surgery' for **advanced advice from our Knowledge Centre** for your workflows and projects.
- Meet our **Help and Support teams who will be on hand** to answer any of your questions.
- Live **Move software demonstrations** including:
  - Operational Geology
  - Interactivity
  - Real Time Model Update
  - Discrete Fracture Network tools
  - Mass Spring Restoration
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  - Forward Modelling Algorithms
  - SCAT analysis
  - Well Handling
  - Turbidites
- Midland Valley Scrap Book!
- Universities involved in our **Field Mapping Training and Support Initiative** will be showcasing their work in Poster Presentations.
- Live **software demonstrations from our Alliance partner Badley Geoscience** including their flagship products TrapTester and StressTester.

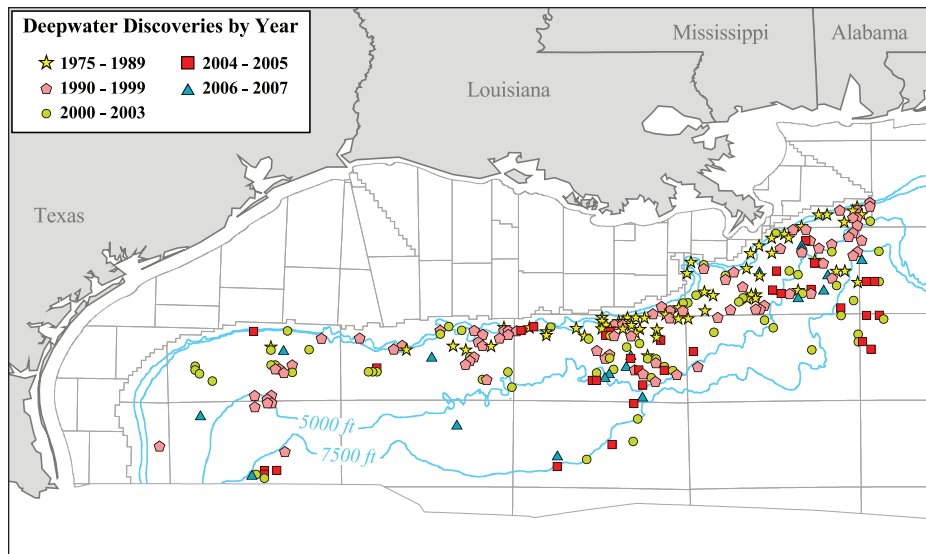
#### Additional activities surrounding the event include:

- Workshop: 'Reducing Structural Uncertainty', Monday 29th September.
- Field Trip: The Architecture of the Highland Boundary Fault. Thursday 2nd October
- Traditional Scottish ceilidh (included with Technical Meeting registration).

For further information visit the Company section of our website, [www.mve.com](http://www.mve.com) or email Sarah, [events@mve.com](mailto:events@mve.com).



The structural geology experts  
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Graphic, data courtesy of Minerals Management Service

## GOM

from page 6

The build-up of U.S. natural gas production is another compelling story, one driven by the growth of unconventional gas supply and better recognized than the growth in offshore oil production.

But for U.S. oil, the ongoing story is the deepwater and ultra-deep-water Gulf of Mexico, where Paleogene-earliest Miocene prospects continue to generate big news.

"In the last couple of lease sales, in our analysis we believe a lot of those companies are targeting the Lower Tertiary and Lower Miocene plays," said another AAPG member, Dave Cooke, who is deputy supervisor of resource evaluation for the MMS Gulf region.

### The Numbers Game

Credit where credit is due: The first-rank heroes of U.S. production growth have been the geophysicists and drilling engineers, with an amazing 10-year record of advances.

"One of the challenges in the Lower Tertiary trend is imaging the prospects below salt," Marin said. "It's only been in the past 10 years we've had depth migration for these subsalt prospects."

And don't overlook the contribution from production engineers, despite some stumbles.

The MMS defines deepwater as water depths over 1,000 feet and ultra-deep water as depths beyond 5,000 feet. Today, production engineers are looking at new projects in 4,000-9,000 feet of water, well into the ultra-deep.

"In the more recent Lower Tertiary discoveries, they're still trying to work out how they're going to produce from those fields, whether they will have host facilities for three or four fields or any stand-alone platforms," Cooke noted.

"They design those facilities for a certain amount of production. If it's good enough it will be stand-alone," he said.

In general, the MMS sticks closely to proved or proved-probable reserve numbers for the Gulf, although it has acknowledged a much larger number for possible reserves, based on company estimates.

"Our reserves numbers are somewhat conservative, but 'reserves' is a somewhat conservative concept," Marin agreed.

The agency would carry projected reserves only as unproved or some other contingent number, he said.

"We've seen over the years where additional drilling has reduced the size of projected reserves, but in other cases they've increased it," Marin noted.

### Going Deeper

Whatever the reserve number, there's no doubt that drilling and production has moved farther and farther offshore.

"In our last report, it was the first time that the top 20 producing fields in the Gulf of Mexico are all deepwater fields," Cooke said.

Industry success in the Gulf has come despite a challenging operating environment that includes sky-high prices for great-depth drilling. In particular, a tight rig market has pushed day rates for offshore rigs through the clouds.

"They're building these things, but it's tough to get them built, it's taking a while, and they aren't all going to the Gulf," Cooke observed.

With exploration interest and oil and gas prices high, the MMS expects good success with its future lease sales in the Gulf. The most recent leasing round for the Western Gulf ended in August and the next Central Gulf lease sale is scheduled for spring 2009.

Companies want to acquire lease blocks in areas they consider highly prospective and add them to the exploration portfolio for analysis and ranking, Marin noted.

"Although these blocks may be leased and in the company's inventory, their ranking will move up and down" as analysis continues and new information becomes available, he said.

That makes it difficult to predict future hot spots for drilling. For instance, improved seismic acquisition, processing and interpretation have actually pushed some exploration back toward shore, as companies are able to identify new prospects in shallower waters.

"It all goes back to, 'Will this block be drilled under its current lease or a future lease?' The prospectivity changes over time," Cooke said.

### The Last Five Years

AAPG member Erik Mason worked the Gulf of Mexico for Shell International Exploration and Production (SIEP) for more than 20 years, serving as everything from senior production geologist to exploration manager to new ventures manager for the western Gulf of Mexico.

He's now Shell regional exploration consultant-Africa, stationed at SIEP's global headquarters in Rijswijk, in the Hague, the Netherlands.

Interviewed by phone in Lagos, Nigeria, Mason said he still considers the Gulf a premier exploration area.

"I think the Gulf of Mexico has been a consistently exciting place to explore, and success rates have been pretty good," he said. "There are still very large discoveries being made."

Advances in seismic processing,

See **Activity**, page 10





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Thanks to projects like Thunder Horse (above), tomorrow holds a beautiful promise for exploration and production in the Gulf of Mexico.

## Activity

from page 8

interpretation and imaging that provide a look at prospects below salt have been especially beneficial for GOM work, Mason noted.

"That's opened up new exploration plays, and it's just continued to happen," he said.

"Seismic capabilities have changed dramatically in the past five years, especially in wide-azimuth seismic across the Gulf of Mexico, that's brought a step-change to exploration offshore," he added.

Now operators can examine a range of new subsalt, seismic-amplitude and other seismic-generated prospects across the Gulf. Recent Paleogene discoveries make the future even brighter.

"There will be several of these coming on over the next several years and a number of operators have made these discoveries," Mason said. "I think that's real encouraging."

### Will Potential Be Realized?

Partnering, interest sharing and acquisitions have allowed relative newcomers like Statoil Hydro and BHP Billiton to stake major GOM positions. This joint cooperation could be one explanation for the industry's success in the Gulf.

Take the Shenzhi-Genghis Khan area initially drilled by Anadarko and now operated by BHP Billiton with Hess Corp. and Repsol YPF as interest holders.

Shenzi is projected to come onstream in 2009 and could reach 100,000 b/d production.

"It's almost like a sharing of information out there," Cooke said. "No one is going to go out there for the first time and try to do it alone."

If there is a learning curve in the deepwater Gulf for both exploration and production, operators can only benefit from their recent experiences in bringing fields onstream.

"It's a production challenge. There's just lots and lots of oil in place in these Paleogene discoveries, for instance," Mason observed.

Overall, "we're looking at lower porosities and permeabilities than we've seen in the past," he added. "It's a challenge to get oil and gas, especially oil of lower quality, out of poorer rocks in commercial quantities."

In the Gulf of Mexico, the oil and gas is definitely there – the real problem is getting it here.

"They're making some big oil discoveries," Cooke said. "It just remains to be seen if they can get that out of the ground and bring it to market." □

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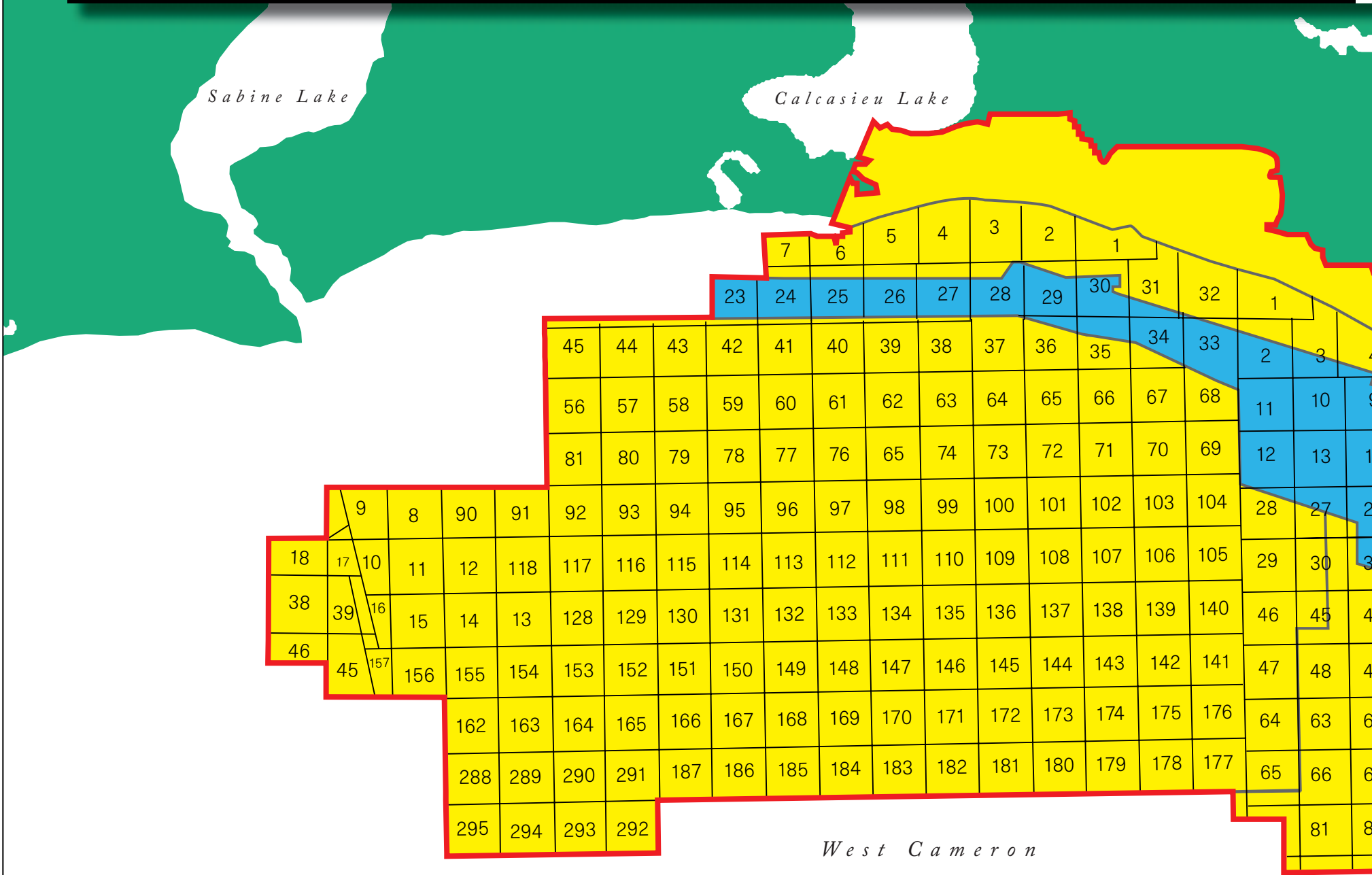
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*Deepwater only a part of the story***Success Breeds Success in GOM**

By LOUISE S. DURHAM  
EXPLORER Correspondent

Exploration and production activity in America's hydrocarbon rich Gulf of Mexico continues unabated.

Great geology, vast sums of capital investment and increasingly innovative technology play key roles in keeping this inarguably magnificent petroleum basin producing copious quantities of oil and gas.

The more than 7,000 leases in the GOM account for 25 percent of the country's domestic oil supply and 15 percent of domestically produced gas, according to the Minerals Management Service.

More than 30,000 jobs are directly related to Gulf energy exploration and production.

The E&P activity spans the gamut from shallow shelf waters out to the ultra-deepwater (greater than 5,000 feet).

About 72 percent of the Gulf's oil production originates from wells drilled in waters 1,000 feet deep or greater, according to the MMS, and the industry's expansion into deepwater continues to increase. In fact, a record high of 15 rigs were operating in ultra-deepwater in 2007.

It is noteworthy that non-major companies have made more deepwater discoveries and hold more deepwater acreage than the major companies.

About 34 percent of the tracts that attracted bids in the Central Gulf Sale 206 in March 2008 are in ultra-deepwater. Lloyd Ridge Block 286 in slightly more than 10,000 feet of water was the deepest tract to receive a bid.

The top bid received for a block –

**“The Gulf of Mexico has produced over 40 billion barrels of oil to date ... but what we're exploring for today was inconceivable 10 years ago.”**

Green Canyon Block 432 – was

\$105,600,789, submitted by Anadarko, Murphy E&P-USA and Samson Offshore.

Sale 206 and the simultaneous Eastern Gulf Sale 224 together garnered a total \$3.7 billion in high bids, with the lion's share of this coming from Sale 206. Sale 224 was notable in the sense it was the first lease sale where the revenue sharing provisions of the Gulf of Mexico Energy Security Act of 2006 became effective.

#### Trending Up

The MMS noted the factors contributing to the increase in deepwater activity include several key discoveries (including recent discoveries in the Lower Tertiary Trend), the recognition of high production rates, the evolution of development technologies and the rise in oil and gas prices.

“The United States in general has been blessed with a lot of rich petroleum basins, and the offshore Gulf of Mexico is a good example,” said AAPG member Greg Simmons, manager of deepwater Gulf at

Devon Energy.

“The Gulf of Mexico has produced over 40 billion barrels of oil to date,” Simmons said, “mainly from the Plio-Pleistocene through the Miocene – but what we're exploring for today was inconceivable 10 years ago.”

For example, think ultra-deepwater, hi-pressure/hi-temperature, low permeability, sub-salt Lower Tertiary targets.

“The first sub-salt exploration wells in the Walker Ridge area were not Lower Tertiary wells at all,” Simmons noted. “They were drilled as Miocene wells – just because we didn't conceive there was a deeper reservoir interval below the Miocene target.”

The Cascade discovery was the first Walker Ridge exploration well that drilled deep enough to test the Eocene and Paleocene sandstone reservoirs, according to Simmons. Following that information, Dana Point – originally drilled as a Miocene test – was re-drilled as a Lower Tertiary discovery, now known as St. Malo.

“We think there could be between three

and 15 billion barrels recoverable reserves in the Lower Tertiary Trend,” Simmons said. “That's a lot of potential, and I think it's sufficient to justify drilling these really expensive, technically challenging wells – our current exploration well costs exceed \$100 million per well.”

“To my knowledge, there have been 14 announced discoveries out of 23 wells drilled in the Trend to date.”

Devon is currently involved in four of the deepwater discoveries in the Lower Tertiary:

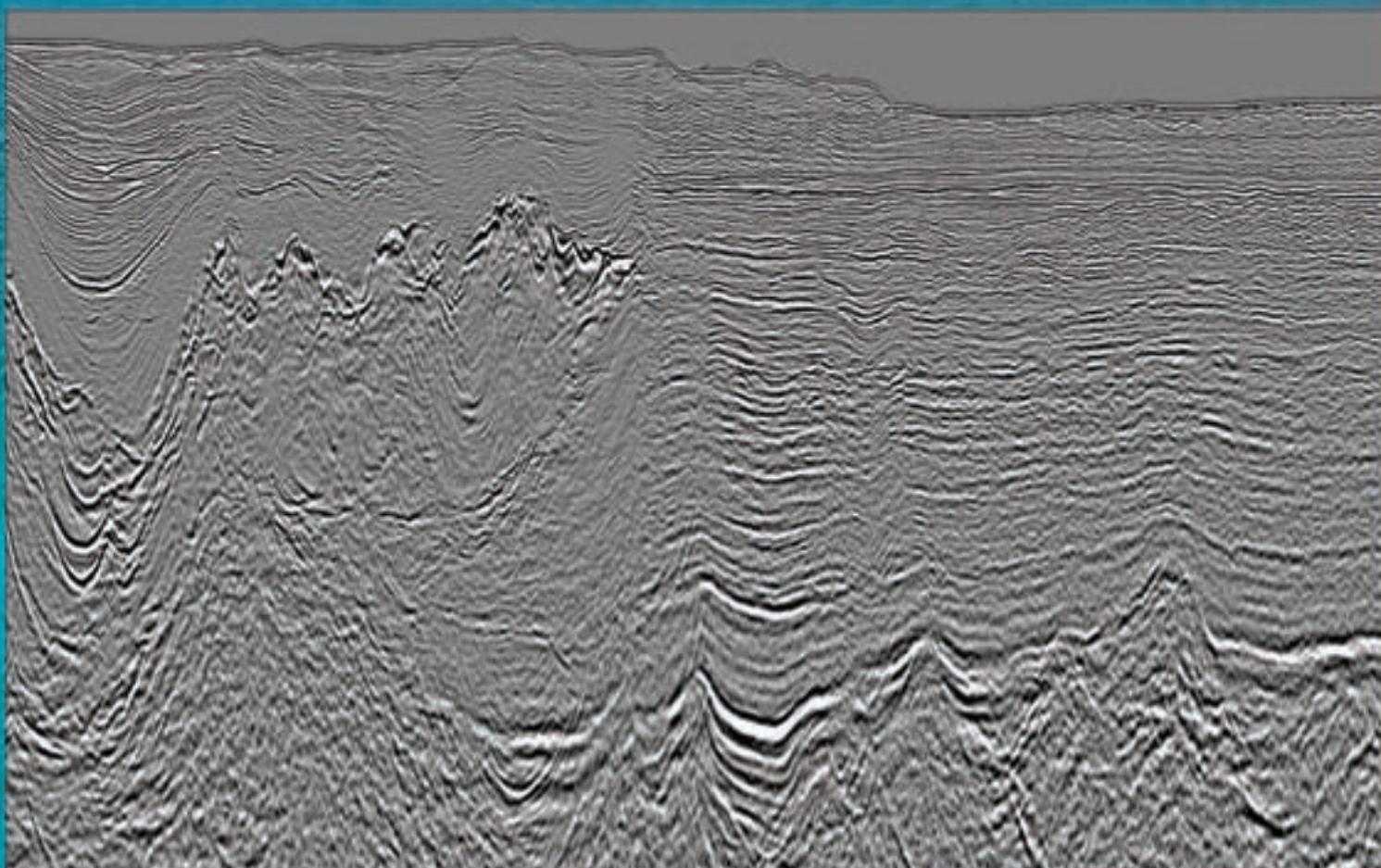
- ✓ Cascade, operated by Petrobras.
- ✓ St. Malo and Jack, operated by Chevron.
- ✓ Kaskida, operated by BP.

Cascade is moving forward on an early production system, scheduled for first production in 2010, according to Simmons. It will be a two-well system that will produce to Petrobras' Floating Production, Storage and Offloading (FPSO) facility, which is the first FPSO in the GOM.

continued on next page



## Brasil Deep Focus Santos and Campos Basins



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continued from previous page

The facility also will take on hydrocarbons from the Petrobras-operated Chinook Field.

The FPSO will be located in close to 8,000 feet of water, making it the world's deepest FPSO to date.

#### Close to the Edge

But the deepwater is only a part of the GOM story today.

For instance, a lot of operators are closely watching veteran shallow water deep gas player McMoRan Exploration's ongoing effort to deepen the former Blackbeard well at South Timbalier Block 168 in 70 feet of water.

The well was temporarily abandoned in 2006 by then-operator ExxonMobil after reaching a measured depth of 30,067 feet.

McMoRan re-entered the well this year

and reportedly has deepened the hole to about 32,000 feet. The company is said to be headed to 35,000 feet with the drill bit, targeting ultra-deep gas on the shallow water shelf.

Shallow water player PetroQuest Energy is among the many companies paying attention to the progress of the McMoRan well.

"On our seismic, we can see things that are interesting – deep seated features and things," said Charles Goodson, chairman, CEO and president of PetroQuest. "But to say we're going to step up and drill a well like anytime soon, we're not going to."

PetroQuest operates a number of offshore fields spanning the Louisiana coast from West Cameron to Main Pass off the Mississippi River Delta. Goodson said their deepest well bottomed out at 20,000 feet and noted that all current activity is in 300 feet of water or less.

"This is by design," he said. "We made

the decision to stay active and somewhat aggressive in shallow water but didn't want to get in that next echelon of 300 to 1,500 feet of water."

#### Looking Ahead

Goodson said his company faced a choice in 2002: Either go for deepwater or resource plays.

"We thought there would be a greater impact on the company with resource plays," he said. "We had such a vibrant undeveloped set of assets in the Gulf Coast and Gulf of Mexico, we decided to keep those and grow them at reasonable rates."

"We took half of our cash flow and got into resource plays, or shales," he added, "and it was a good bet."

The company's goal is to be 75 percent unconventional and 25 percent Gulf Coast/Gulf of Mexico, according to

Goodson.

"As we double and triple the size of the company, it will take more of a full time effort to maintain that balance," he said.

"We have at least a three-year inventory of projects we'll drill in South Louisiana and offshore, and we're now looking at replenishing that and telling our guys to generate something today we can drill three years out."

There's little doubt among many industry players that the GOM has a continuing bright future.

"The Gulf of Mexico has proven to be a very prolific petroleum basin," Simmons said, "and it continues to keep on going."

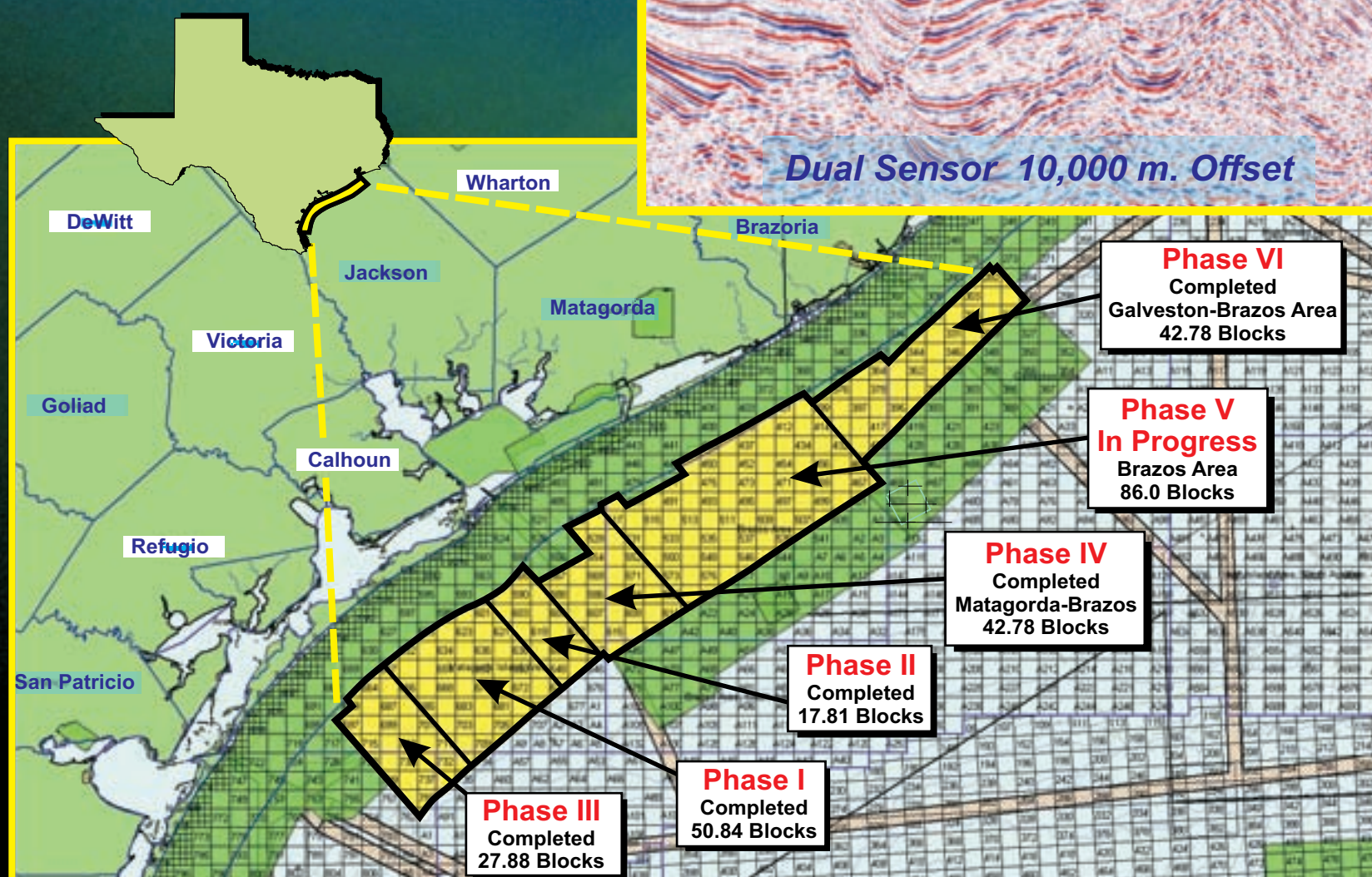
"The exploration trends that we're pursuing today were difficult to envision even 10 years ago," he noted. "Who knows what will come along in the next 10 years? What's left that we haven't discovered?"

"After all, we've already gotten 40 billion barrels of oil from the Gulf." □

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# 'Drill It or Lose It' a Losing Proposal

From the unsuccessful Responsible Federal Oil and Gas Lease Act, or H.R. 6251: "To prohibit the Secretary of the Interior from issuing new federal oil and gas leases to holders of existing leases who do not diligently develop the lands subject to such existing leases or relinquish such leases, and for other purposes."

By LOUISE S. DURHAM  
EXPLORER Correspondent

As the argument continues on the national scene over whether to open up more American-owned acreage to drilling, there's been no lack of political rhetoric calling for the companies to drill instead on the "idle" leases already in their inventory.

"Drill it or lose it" misunderstandings abound, including such rhetoric as:

- ✓ The federal government gave the leases to the companies.
- ✓ Companies intentionally let blocks go idle.

- ✓ Companies are paid by the government to not drill their leases. Etc., etc., etc.

"All these statements are made by people who do not understand the exploration/exploitation/development process we go through," said Charles Goodson, chairman, CEO and president at PetroQuest Energy. "It's like asking why don't you build a rocket and go to Mars tomorrow."

In fact, the industry already operates in a use-it-or-lose-it system for all



practical purposes, according to AAPG member Greg Simmons, manager of deepwater Gulf at Devon Energy.

"After we lease something in the Gulf of Mexico, we have five years on the shelf and 10 years in the deepwater to

get our prospects to a mature, drill-ready status," Simmons said. "Then we have to get exploration permits, appraise our discoveries and then plan for development."

"Our current exploration costs exceed \$100 million per well," Simmons said, "so we need to be diligent that first of all we're drilling the very best prospects in our inventory and, second, that we're drilling them in the right place."

It's not unusual for companies to lack the capital and the drilling rigs to drill all projects in inventory before the leases expire. In fact, there are only about 30 deepwater rigs working in the GOM, with another 20 scheduled for delivery over the next few years.

The lack of resources to drill all the prospects is the reason the last few lease sales have been such large events, according to Simmons.

"In the four sales since August 2007, over 1,600 blocks were leased," he said. "That's about 10 million acres leased in the Gulf of Mexico over the last calendar year. That was at an industry cost of \$7 billion we paid to lease those acres."

"The vast majority of that entailed leasing acreage that was available for the first time in a lease sale since it had either expired or been relinquished voluntarily," Simmons noted. "Given the choice, I'm sure the previous leaseholders would have loved to have hung on to the acreage, but they had no choice."

"It was very valuable to them, but they had to let it go back into the MMS inventory of acres that could be leased," Simmons said. "In many instances, the companies re-leased acreage they previously held, but only if they were successful in the competitive bidding forum – it's a sealed competitive bidding."

Simmons emphasized that the federal treasury already has collected money on any expired acreage turned back to the MMS. The treasury collects again each time the acreage is re-leased.

Currently, there are 40 million acres under lease in the GOM, according to Simmons. Last year, about 25 percent of this amount, or 10 million acres, was acreage that had been turned over and re-leased.

"There's a perception that much of the acreage is being held as inactive leases," Simmons said. "For all those leases being held by industry, there are annual payments required, royalty payments if producing and rentals prior to acreage becoming productive."

This is not chump change.

"The most recent information I have is for the fiscal year 2006 from a Congressional Research Service report, which notes federal revenues from all U.S. offshore leases in 2006 was \$7.6 billion," Simmons said, "which is a combination of both royalties and rental payments."

"So if you think of it from a fiduciary responsibility we have to our shareholders, it doesn't make sense we would hang on to acreage at a high cost if we have no future plans for that acreage," Simmons said. "That's why we go through an annual or semi-annual process of periodically looking at our acreage, and we voluntarily give back leases to the MMS if we have no plans for them because it lets us manage the expense we have for annual rental payments."

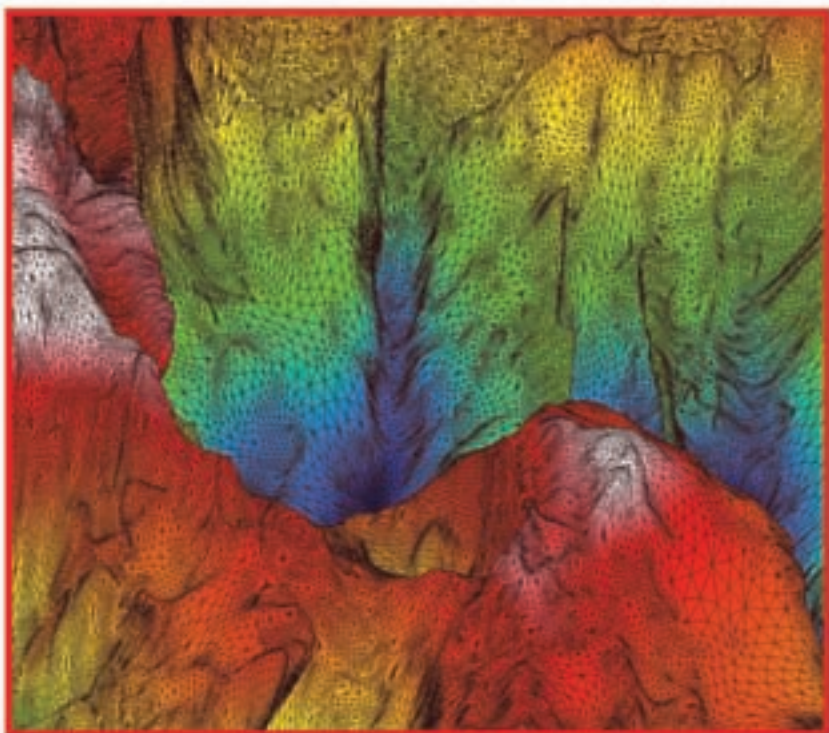
"Really, the whole idea of inactive leases is a misunderstanding." □

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*Haynesville, Lower Tertiary the latest allures***Gulf Coast Still Revealing Its Charms**

By LOUISE S. DURHAM  
EXPLORER Correspondent

America's Gulf Coast long has been noted for its abundant oil and gas accumulations and prolific production.

In fact, the region's role in the industry dates back to 1901, when Louisiana's Jennings Field and the giant Spindletop Field near Beaumont, Texas, were discovered only months apart.

Lately, however, there's talk aplenty that the extreme rate of drilling and production activity in the Rocky Mountain region will soon relegate the Gulf Coast to dinosaur status.

That remains to be seen – not because the Rockies are going to go away, but rather because this hydrocarbon-rich locale in the southern United States appears very much alive and vibrant.

A couple of stellar examples are the still-rockin' Barnett Shale play in Texas and the near-frenzied action in the brand new Haynesville Shale gas play in north Louisiana.

"The Haynesville has been a game changer onshore," said AAPG member Art Donovan, senior project adviser of North American gas at BP and technical program co-chair of the upcoming GCAGS-GSA annual meeting in Houston. "It's an order of magnitude more than anything else in terms of size."

One Haynesville operator, in fact, estimates between 7.5 Tcf and 20 Tcf resource potential for its company, depending on the ultimate size of its leasehold.

"For the Gulf Coast, the two 90-pound gorillas in the room are the Haynesville

**T**he Gulf Coast has been the independents' playground for decades.

onshore and the Lower Tertiary play in the deepwater Gulf of Mexico," Donovan noted.

**Room for the Little Guys**

Much of the region between these disparate geographic locales also remains plenty attractive – especially to the smaller players who long have been a dominant force in Gulf Coast E&P.

"There's still a lot of activity for small independent exploration companies and producers along the Gulf Coast," said AAPG member Ken Nemeth, senior geoscientist at Schlumberger and current president of the GCAGS. "They're always going to play their niche areas."

Nemeth, who's had plenty of experience not just participating but also observing regional trends and activities, knows there is and always will be an ebb and flow factor.

"They (small independents) can go into the coastal waters and buy fields that others have to write off because they're not profitable for them," Nemeth said. "But someone new comes in and starts off with a new scheme, and away they go."

"Given the high prices we have, the companies want to drill more," he noted.

Technology plays a role, too. It's better, it's more affordable and it's available.

"They have the utility of 3-D, the workstation capability to evaluate the

seismic more quickly and find better prospects," he said.

But there are problems in the region, and they have nothing to do with the geology.

"The potential limitation in the Gulf Coast is on the drilling side, from the standpoint of the number of rigs available and the crews to populate those rigs," according to Nemeth, who noted that pipe also looms as a problem.

"I talked to people last year who bought pipe months ahead of when they would need it, predicated on being able to get a rig and drill a well," Nemeth said. "But they hadn't been able to get a rig, and the pipe condition had deteriorated."

**Future Potential**

Nemeth noted there are so many industry folks headquartered in the Gulf Coast – especially in Houston, New Orleans, Lafayette, San Antonio and Corpus Christi – that he envisions there will continue to be a lot of action in this region.

"In the digital age the world has shrunk so much that people can explore anywhere," Nemeth said. "But if you can't get into plays because of acreage, you're always going to come back to your favorite playground – and the Gulf Coast has been the independents' playground for decades; I don't think that's going to change."



The Gulf Coast has been picked over many times, e.g., the Austin Chalk has had five reincarnations, according to Nemeth.

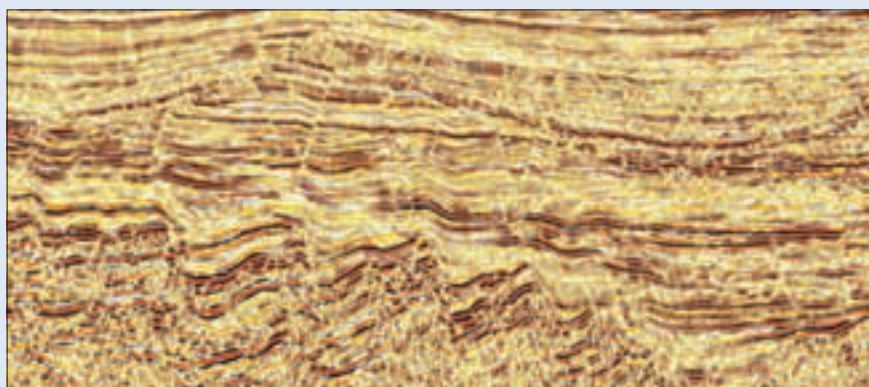
"As tools for the geologist and geophysicist become more efficient and less costly – whether workstations or PCs," Nemeth said, "the software is available to help explore larger areas more quickly."

"There's going to be someone who's always going to revisit an area and find something someone may have missed or by-passed."

Nemeth noted the seismic companies are looking at the transition zone once again with modern acquisition tools to determine if they can re-acquire or re-process data through this region and open up a somewhat obscured area for exploration.

"If you look at that kind of area that's been by-passed as much for lack of quality seismic as anything else, that could be another impetus to exploration," Nemeth said.

"The Gulf Coast is not going to go away." □

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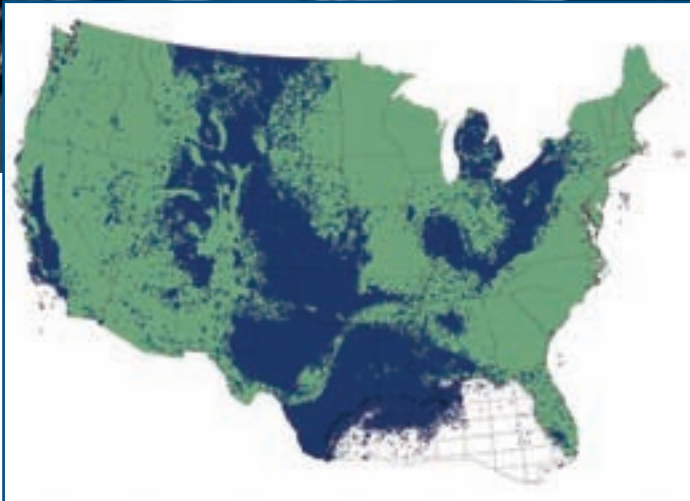
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EOE



Photo courtesy of BP Canada

Getting a better view: The HIVE (Highly Immersive Visualization Environment) at the BP Canada office, with its flat screen, blended two channel enclosed projection and touch-sensitive screen to the side, is an example of how the rapidly evolving technology can be useful for training, multi-discipline collaboration and improved decision making.

### From reservoir to surface planning

## Visuals Explore Past the 'Snapshot'

By LOUISE S. DURHAM  
*EXPLORER Correspondent*

They say seeing is believing. If that's true, then imagine the possibilities of seeing *more*.

A virtual smorgasbord of up-to-the-minute advances in visualization technology to help enhance and improve exploration efforts is on tap for a session at the upcoming joint annual meeting of the GCAGS-GSA in Houston Oct. 5-9.

The session dubbed "Visualization of Depositional Systems" is among the many events likely to attract an SRO crowd.

Talk about eye-popping.

This particular gathering will explore advances in visualization techniques that enable geoscientists to identify, interpret and investigate models of depositional systems in a broad array of environments, from fluvial to deep marine.

"Our goal is to show where visualization stands now, with an emphasis on sedimentology and stratigraphy but not limiting topics to just that," said session co-chair Jim Thomson, visualization theme lead at BP.

"We tried to get a cross section of abstracts and presentations that cover that whole gamut," he noted "because this is not just the usual oil and gas crowd we would normally get."

Indeed, organizers were sensitive to the need to cover the "whole gamut" because it's a joint meeting of GCAGS and GSA.

"The presenters represent a cross section from industry," Thomson continued, "with speakers from both large and small petroleum companies and from vendors and from academia."

#### Come Fly With Me

The presentation format is out-of-the-ordinary.

"About half the talks will be standard PowerPoint presentations you normally get," Thomson said. "But the real icing on the cake is that about half will be live demos of 3-D visualization where the presenters will plug in their computers and do live visualization fly-throughs with their data sets and their workflows – so it will be dynamic instead of the static PowerPoints."

Thomson said they'll be bringing in 3-D stereoscopic visualization equipment from the Louisiana Immersive Technologies Enterprise (LITE).

"We'll have specialized glasses, projectors and screens," he said, "so the whole audience will have an IMAX-like experience for those talks."

The session is timely, indeed, according to session co-chair Kevin Bradford, geophysicist-reservoir characterization team at Shell.

"What we're seeing in various companies is the use of visualization is becoming increasingly important, all the way from initial project framing up to the actual review process with management teams at the various stages of project review," Bradford said.

"It's becoming more and more important to actually interrogate the data in a live fashion," he said. "Rather than just having snapshots and PowerPoint-type presentations, it's increasingly essential to actually see the data live – that's what visualization brings, and we're seeing that kind of at all stages now."

"It used to be something you might see at the subsurface level when actually delineating reservoirs, but now it's all the way up there to surface facility planning as well," Bradford noted.

"That's what the session is trying to show – to highlight new techniques that enable that, but also to show this kind of breadth of where visualization can really play a role all the way from shallow hazard mapping to large-scale regional exploration."

#### Twice As Good

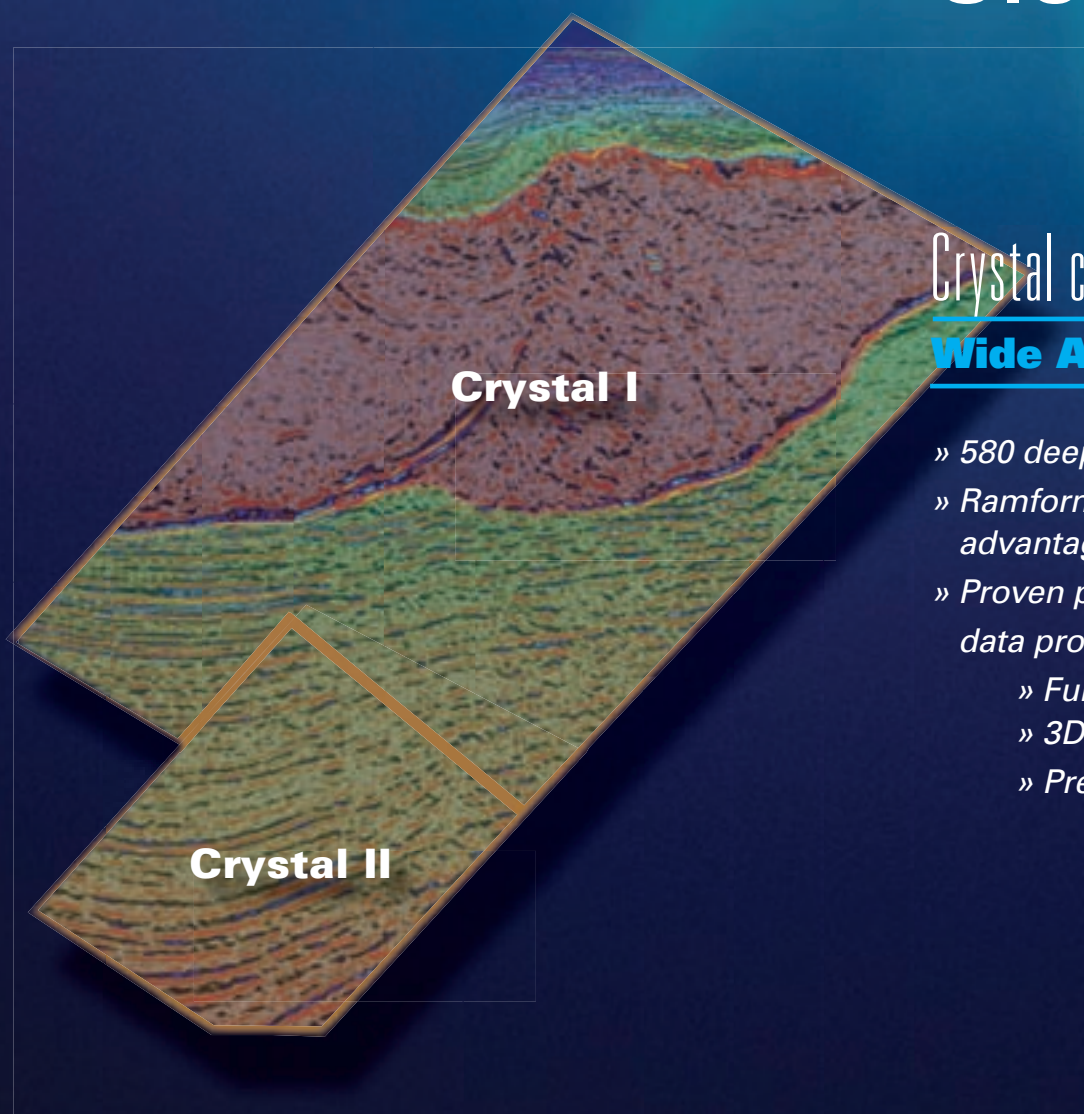
The response and enthusiasm triggered by the visualization session planned at this year's GCAGS-GSA meeting in Houston have been notable.

In fact, AAPG member Gary Kinsland, Pioneer Production-endowed professor of geology and engineering at University of Louisiana at Lafayette (ULL), was so enthusiastic he's presenting twice – besides overseeing delivery of all the gear from the LITE.

See **Visualization**, page 22



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# Goal Is to Integrate Section, Plan Images

By LOUISE S. DURHAM  
EXPLORER Correspondent

Three-dimensional seismic data can be invaluable with regard to mitigating risk associated with the presence of reservoir, source and seal facies.

For AAPG member Henry Posamentier that's not a casual concept. That's a key foundation of his work – and his approach to his work.

Posamentier, an AAPG George Matson Award winner and popular past Distinguished Lecturer, is senior consultant geologist at Chevron.

According to him, 3-D data can afford

direct imaging of depositional elements, which can then be analyzed by applying seismic stratigraphic and seismic geomorphologic principles to yield predictions of lithologic distribution, insights to compartmentalization and identification of stratigraphic trapping possibilities.

This will be the theme of Posamentier's presentation at the visualization session during the GCAGS/GSA annual meeting in Houston.

"We're using 3-D seismic data to predict (lithology) as always," Posamentier said, "but we're doing it 21st century-style."

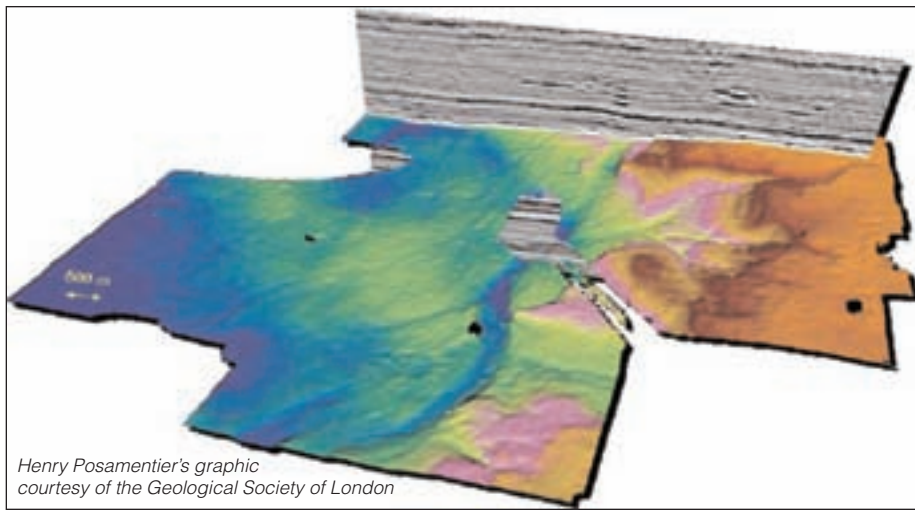
"In the old days it was 2-D seismic and now it's 3-D, and what that brings to the table is the ability to integrate the section view – which is the 2-D – with the plan view that we derive from the 3-D," Posamentier said.

"We're integrating the concepts of stratigraphy with the concepts of geomorphology to get a more robust interpretation," he said, "and a much more precise prediction of lithology ahead of the drill bit."

"The key buzzword is integration of section view – or stratigraphic – with plan view – or geomorphologic – images," Posamentier said.

"That's really the key," he noted. "It's that integration of good old fashioned stratigraphy with good old fashioned geomorphology, or the study of land forms."

"It's being able to see depositional systems in the plan view that really elevates our ability to predict." □



Henry Posamentier's graphic  
courtesy of the Geological Society of London

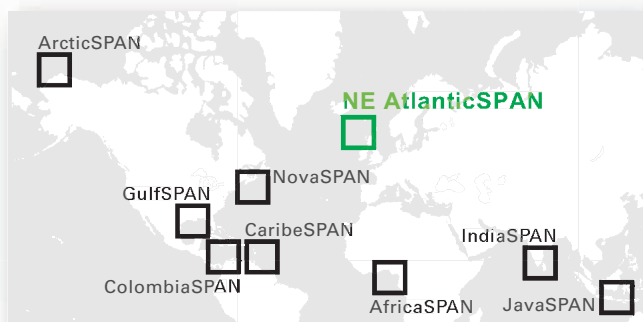
**21st century exploration:** In this example of illuminated time structure of the base Cretaceous unconformity in the western Canada sedimentary basin (Alberta), fluvial drainage patterns suggest paleo-drainage from a highland area on the right side of the surface. Numerous channels are observed in the low area on the left.

## Northeast AtlanticSPAN Basin-scale, Ultra-deep Data Program

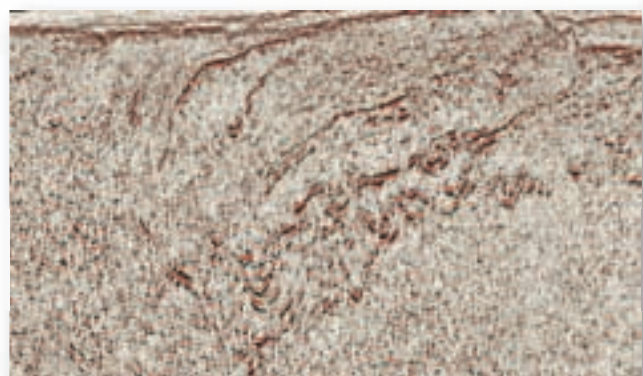


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## Visualization

from page 20

Kinsland and his peers at ULL are developing a 3-D GIS of north Louisiana; they have digitized over 700 well logs and are developing two different 3-D systems in parallel. He noted the goal is to develop one or both systems such that they can view and interpret the 3-D data within the total immersive system (TIS) at LITE.

Kinsland said they believe that interpretation within fully immersive, interactive 3-D virtual reality space will enable them to understand the difficult-to-interpret fluvial Wilcox formation in North Louisiana more quickly and thoroughly than otherwise possible.

The group's current interest is coalbed natural gas in this region, but Kinsland noted the data set is broadly applicable.

"We'll be doing Wilcox well log data (in one presentation) at the session in dual projector 3-D with 3-D glasses and showing the stage where we are," Kinsland said, "and telling people where we want to go with this."

"We'll have some well logs in 3-D, and we'll move them around and look at the different surfaces and glean information."

"We're still working to get to the point where we can put the well logs in a TIS," Kinsland said, "and that's where we want to go."

"I should be able to move through my well logs, move within the Wilcox rocks and interpret them," he said.

Kinsland said that interpretations he's done previously in 3-D convinced him that being in the data allows you to be "a whole lot more intuitive" about the way in which you interpret the data.

"If you want to look at something, you do – you just walk over and look at it," Kinsland said. "It's like being at the outcrop."

"That's where we want to go," he said, "and we're not there quite yet." □



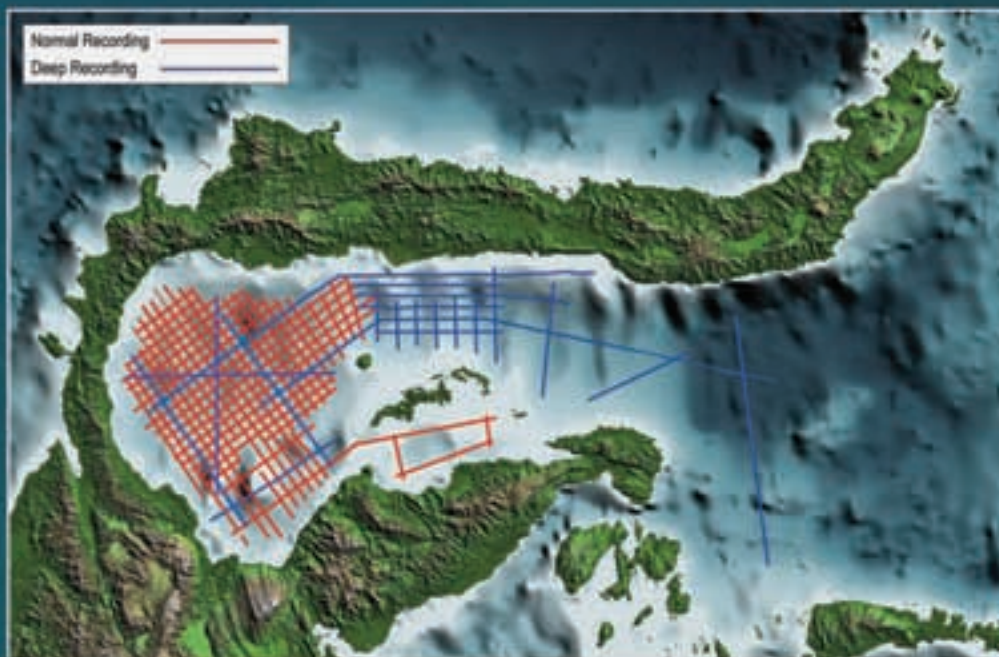
# Indonesia



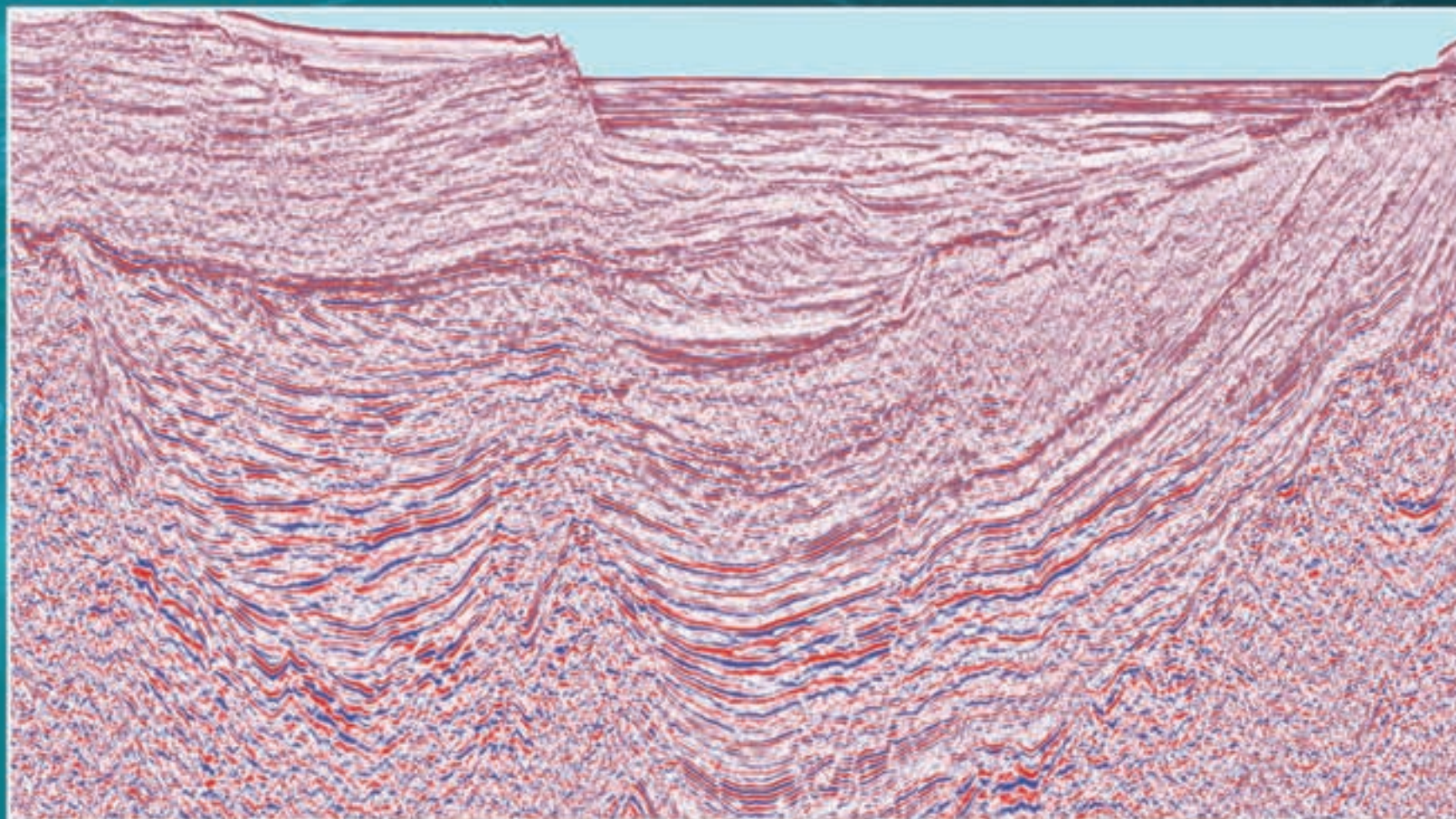
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The Ohio Geological Survey's CO<sub>2</sub> No. 1 carbon sequestration research well in Tuscarawas County, Ohio.



Photo courtesy of Ohio Geological Survey

## EOR a rational starting point Sequestration Faces Variety of Hurdles

By DAVID BROWN  
EXPLORER Correspondent

It's a safe bet that carbon sequestration has a big future, but a wild gamble to guess how that future will play out.

Government regulation, the economics of capture-and-injection, legal restrictions, geological considerations and even the price of crude oil will help determine how – and how fast – new CO<sub>2</sub> projects develop.

Two oral presentation sessions will address carbon sequestration issues at the 2008 AAPG-SPE Eastern Section's annual meeting, set Oct. 11-15 in Pittsburgh.

Both sessions cover relevant geological and technical topics, including a look at CO<sub>2</sub> sequestration possibilities in the Michigan, Illinois and Appalachian basins.

AAPG members Larry Wickstrom, Ohio's state geologist and division chief of the Ohio Geological Survey in Columbus, and Kristin Carter, senior geological scientist at the Pennsylvania Geological Survey in Pittsburgh, will serve as co-chairs for the sessions.

Wickstrom noted that the U.S. Department of Energy sponsors a network of seven Regional Carbon Sequestration Partnerships to help determine the technology, infrastructure and regulations needed for large-scale CO<sub>2</sub> projects.

"In the Eastern Section we've got two of the DOE regional partnerships – one is the Midwest Regional Carbon Sequestration Partnership that's led by Battelle," as well as



Wickstrom

the Midwest Geological Sequestration Consortium (MGSC), Wickstrom said.

Another DOE partnership, the Southeast Regional Carbon Sequestration Partnership, includes some of the southern states in the AAPG Eastern Section area.

Economics will play a huge part in the future development of carbon sequestration. Because of that, Wickstrom said CO<sub>2</sub> injection for enhanced oil recovery (EOR) makes the most sense as a starting point.

"I've been looking at geologic CO<sub>2</sub> sequestration-related topics for 10 years," he said. "Just about everybody who works in that field agrees that EOR is vital in getting CO<sub>2</sub> sequestration off the ground."

"With oil prices as they are now, it's very doable," he added.

### Costly Proposition

The costs of building infrastructure simply to begin carbon dioxide capture and injection is a major hurdle for CO<sub>2</sub> projects.

"It will be very expensive on the front end to develop the compression needs and the

See **Sequestration**, page 26

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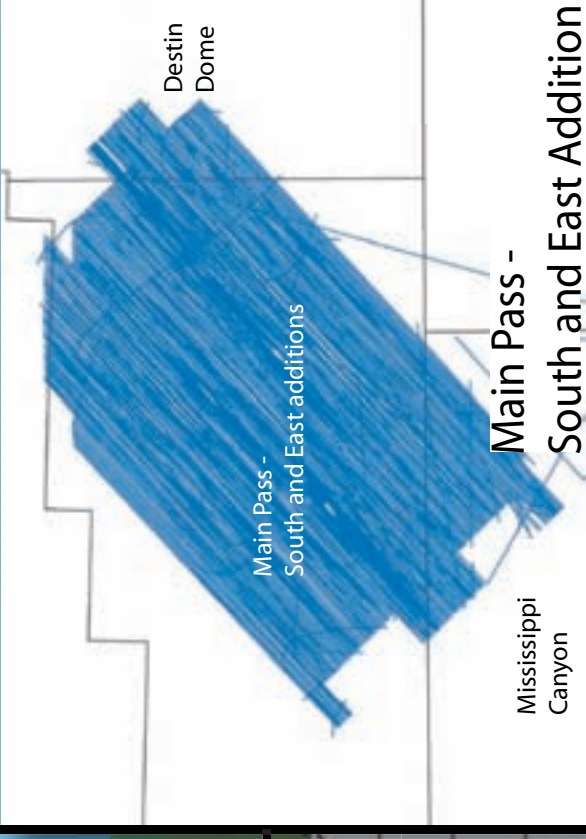
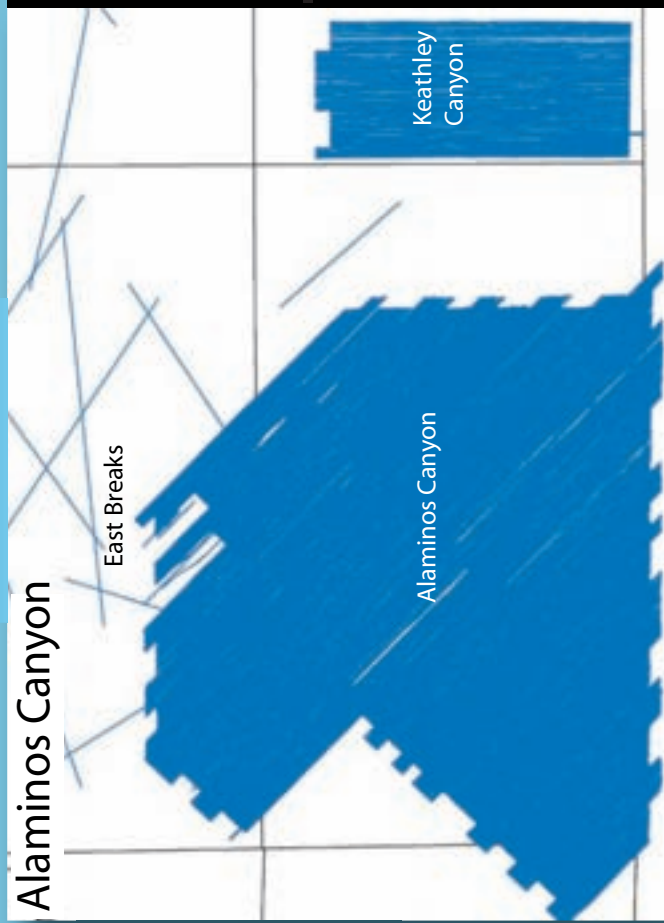
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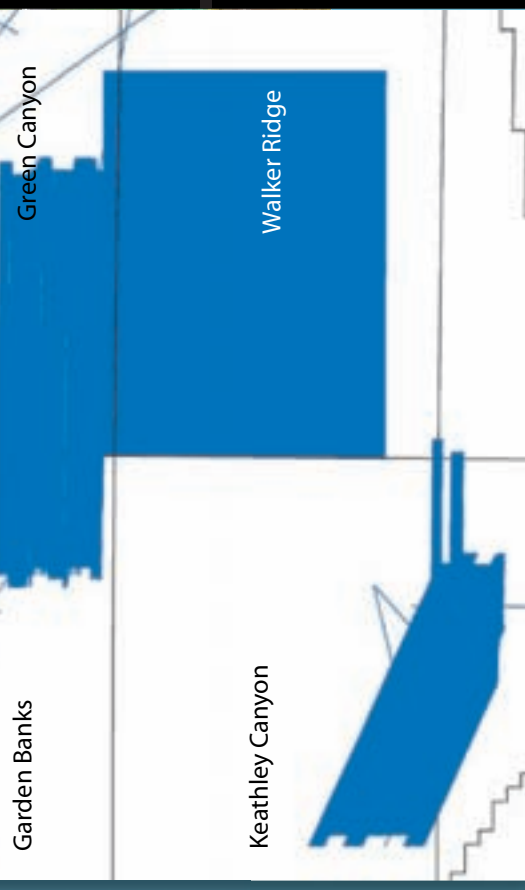
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## Shale, CO<sub>2</sub> Spotlighted

The hot Marcellus Shale play and carbon sequestration will have high profiles at this year's AAPG Eastern Section annual meeting, set Oct. 11-15 in Pittsburgh.

"Appalachia – Unconventional Since 1859" is the theme for this year's meeting, which will be held jointly with the Society of Professional Engineers.

The extensive technical program will feature more than 80 technical papers, field trips (including "The Marcellus Shale Gas Play as Seen From Outcrops Within the Valley and Ridge of Pennsylvania"), short courses, workshops and more than 50 exhibitors.

A seven-paper session specifically

on the Marcellus Shale will be held, as well as an all-day session of CO<sub>2</sub> sequestration.

Other sessions will include:

- ✓ Tight Sands and Shale.
- ✓ Mississippian-Devonian Shales.
- ✓ Improved Enhanced Recovery

Methods.

✓ Reservoir Analysis and Development.

✓ Utica Shale/Technology Applications.

✓ Drilling, Completions and Horizontal-Multilateral Wells.

More information, including registration details, can be found online at <http://www.aapgse2008.org/index.htm>. □

## Sequestration

from page 24

pipelines," Wickstrom said. "You're talking hundreds of millions of dollars just to develop one region."

Another challenge for EOR projects has been finding sources for reasonably pure, injectable CO<sub>2</sub>.

Operators in West Texas enjoy an at-hand source of natural carbon dioxide but are still "starving for CO<sub>2</sub> – they can't get enough of it to do all the EOR projects they've wanted to do," Wickstrom noted.

"Here in the East we've never had a CO<sub>2</sub> source available to us, but right now the ethanol plants that have been built and are being built are a good source of CO<sub>2</sub>," he said. "That's a pretty easy source to capture."

Taking CO<sub>2</sub> produced by Integrated Gasification Combined Cycle power plants is another possibility, Wickstrom said. Combined-cycle plants use coal to produce syngas, typically for powering gas turbines, and are considered more efficient than coal-fired plants because they can capture and use waste heat.

With a high-purity CO<sub>2</sub> source on one end and the economic boost of EOR on the other, oilfield injection for carbon sequestration appears to make economic sense.

"What I'm hoping to see is that the oil and gas operators and the large CO<sub>2</sub> point-source generators can form some nice partnerships to share the cost of all of this," Wickstrom said.

### Long Time Coming

But even then, large-scale projects will take many years to develop.

Wickstrom described a hypothetical EOR project in which a large oil field may eventually take most of the projected two million metric tons per year of CO<sub>2</sub> available from a large plant some tens of miles away.

The project requires pipelines, compression equipment and injection equipment. Some existing wells would become injectors and other new injector wells would be drilled.

"It may take 10 to 15 years to ramp that field up to where it could take the entire two million tons per year," Wickstrom noted. "But once you start to develop that pipeline infrastructure, you can leapfrog to other oil fields and start connecting to other CO<sub>2</sub> point sources."

Unlike sequestration of CO<sub>2</sub> from power plants, EOR injection projects don't necessarily require a great deal of government involvement or support, he said.

"I think a lot of this could pay for itself – the price of oil right now is going to pay for a lot of it," Wickstrom explained.

"What's needed are simply some federal government-guarantees for the developers of these very capital-intensive projects, such as new IGCC power plants and proposed coal-to-liquid plants," he added.

In regard to capturing CO<sub>2</sub> from power plants, "there's a lot of research going into that but it's very expensive," he said. "There's a big challenge in getting that CO<sub>2</sub> out of the flue gas."

That's why government regulation and coming carbon-capture requirements will drive the development of CO<sub>2</sub>-injection projects for power plant emissions, according to AAPG member Hannes Leetaru, petroleum geologist for the



Leetaru

carbon sequestration team at the Illinois State Geological Survey in Champaign, Ill.

"For power plants you have to have requirements because you probably increase your utility rates by 20 percent or more if you capture CO<sub>2</sub>," he said. "You don't want to do it if your competitors aren't going to do it."

### Baby Steps

Leetaru and many others working in the carbon sequestration area expect the U.S. Congress to write new cap-and-trade emissions trading laws.

In a cap-and-trade system, regulators define an established cap or total limit on emissions. Companies then trade credits to determine how much pollution each

See **CO<sub>2</sub> Project**, page 28



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Location of the Ohio Geological Survey's CO<sub>2</sub> research well, which was completed in early August. Analysis of the log, rock and formation testing data will take place over the next several months. Officials believe it will provide "a significant amount of data" to their regional modeling efforts for CO<sub>2</sub> sequestration.



## CO<sub>2</sub> Project from page 26

source can emit. Total emissions have to remain below the cap.

Emissions trading has many variations, however, and no one can predict how Congress will handle the issue or how the result will influence carbon sequestration.

Under the DOE's MGSC partnership, the Illinois survey is conducting field testing and drilling for carbon-sequestration demonstration projects.

"Most of our efforts right now are going into drilling a CO<sub>2</sub> sequestration well in Decatur (Illinois)," Leetaru said.

"There's an Archer Daniels Midland (ADM) Co. ethanol plant there. We're going to capture the CO<sub>2</sub> from that plant – it's really almost pure CO<sub>2</sub> – and pump it

into the subsurface," he added.

This type of activity is so new that the Illinois Environmental Protection Agency had to develop new rules and procedures for issuing a CO<sub>2</sub> underground injection control permit, Leetaru noted.

And in July, the U.S. Environmental Protection Agency proposed its first technical criteria for CO<sub>2</sub> injection-well construction, operation and monitoring.

The EPA's proposed rule would add a sixth category to its injection-well control program, this one specifically for geologic storage of CO<sub>2</sub> 800 meters or more underground.

The recent regulatory activity points up how near to its infancy CO<sub>2</sub> injection for carbon storage really is.

According to the DOE, only about 35 million tons of CO<sub>2</sub> are currently stored in the United States, mainly for EOR. By contrast, a state like Ohio emits an estimated 275 million metric tons of CO<sub>2</sub> into the atmosphere annually.

### Geologic Challenges

For long-term sequestration of CO<sub>2</sub>, geologists will have to identify reservoirs with the right characteristics for storage.

"In a way, it's very similar to looking for an oil and gas reservoir – you look for porosity and permeability. The key factor you look for is whether there's a seal on top," Leetaru said.

For injection of CO<sub>2</sub> from the ADM ethanol plant in Decatur, the MGSC test well targets the Mt. Simon Sandstone, a major regional saline-reservoir formation that extends across several states.

"In Illinois we know we have a seal on top of the Mt. Simon because they've been injecting natural gas into the formation in the northern part of the state for gas storage for a long time," Leetaru said.

Current plans call for the compressed CO<sub>2</sub> to be injected to a depth of more than 6,500 feet. The CO<sub>2</sub> is compressed but not cooled to liquefy, and in fact may have to be heated, Leetaru noted.

"If you have really cold CO<sub>2</sub> going down there it would probably crack the rocks," he said.

The entire project should conclude in 2012 and will cost an estimated \$84.3 million, with the DOE providing \$66.7 million and the rest coming from ADM and other sources.

In this case, also, the injection program will be limited to a trial basis and will take only part of the available CO<sub>2</sub> output.

"We plan to inject about 1,000 metric tons a day into the formation. That's a fairly low rate," Leetaru said.

Geologists may be pressed to identify and analyze saline reservoirs of sufficient, reliable capacity if and when large-scale sequestration projects develop across the United States.

"Trying to understand the geology is a challenge because there haven't been a lot of wells drilled into the saline formations," Leetaru said.

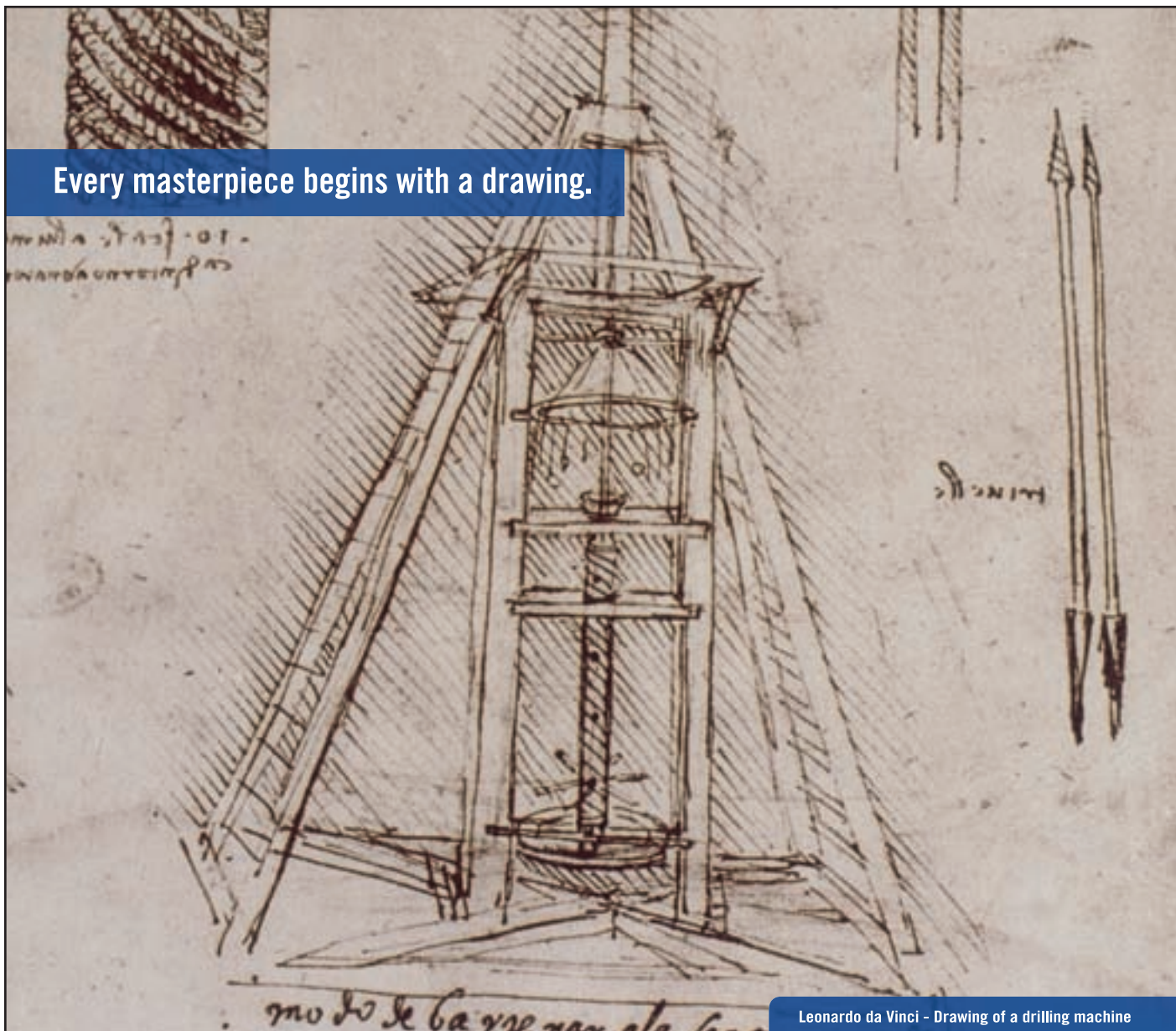
Even in EOR projects for currently producing fields, reservoir nature has to be analyzed for response to CO<sub>2</sub> injection, Wickstrom observed.

"The reservoir testing is key. We've got some reservoirs that are sure, or almost sure, because they're similar to the West Texas fields that have already been flooded," he said.

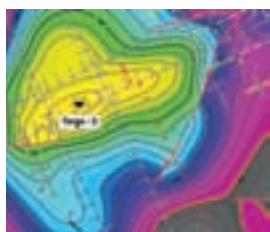
The only predictable part of the future of CO<sub>2</sub> sequestration may be that it will take many more trial projects, many more dollars and many more years to develop.

"There are only a handful of sequestration projects going on right now. You want to have a big representation of test sites," Leetaru noted, "so you can say, 'It works here. And it works there.'" □

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*Program expanded*

# Ten Lecturers Hitting the Road

By VERN STEFANIC  
EXPLORER Managing Editor

It's varied, it's creative, it's comprehensive and, in terms of sheer size and aspirations, it's an effort of near-historic proportions.

It is this year's AAPG Distinguished Lecture program, the Association's flagship initiative for spreading the latest in science, technology and professional information.

This year's DL program, funded largely by the AAPG Foundation, will offer 10 domestic lecturers – one of the largest numbers of domestic speakers in the program's history.

International lecturers and this year's Distinguished Instructor lineup are yet to be announced.

The ambitious domestic tours start in September (see related story, page 36).

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.

Last season's speakers (both domestic and international) appeared at about 150 universities and societies, reaching an estimated 8,000 people.

This year's program, as in past years, offers speakers from both



Duncan



Feazel



Levy



Hughes



Dickens



Gardner



Garziona



Humphris



Jennings



Rankey

industry and academia, covering topics that range from reservoir modeling to the role of outcrop models on subsurface characterization of deepwater reservoirs to microseismic

opportunities to the consequences of climate in Tibet.

Something familiar about this year's lineup is the continuation of the intersociety lecturer effort – a cooperative program that presents an

opportunity for cross-discipline lectures.

This year's AAPG/SEG Intersociety

See **Lecturers**, page 32



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## Lecturers

from page 30

Lecturer, seventh in the series is **Peter M. Duncan**, president of MicroSeismic Inc., Houston. His lecture will be "Aggressively Passive: Microseismic Opportunities Over an Oilfield's Life."

Duncan's tour begins this month and will last through December, eventually visiting at least nine countries.

In keeping with the alternating logistical responsibilities for the intersociety lecturer, his tour will be coordinated by SEG.

Other specially designated

lecturers this year include:

□ **Charles T. Feazel**, principal carbonate stratigrapher for ConocoPhillips, Houston, who is this year's J. Ben Carsey Distinguished Lecturer.

The Carsey lecture is an annual domestic tour provided by contributions from J. Ben Carsey Jr. of Houston, to establish a named lecturer in memory of his father, who served as AAPG president in 1967-68.

Feazel will offer two lectures:  
✓ "Using Modern Cave Systems as Analogs for Paleokarst Reservoirs."

✓ "North Sea Chalk: 40 Years of Production at Ekofisk Field From a Rock Some Said Would Never Flow Oil."

□ **Marjorie Levy**, senior staff

research geologist for Chevron Energy Technology Co., San Ramon, Calif., is this year's Haas-Pratt Distinguished Lecturer.

The Haas-Pratt lecture is a domestic tour provided by contributions from the late Merrill W. Haas, in honor of famed geologist (and Haas' mentor) Wallace Pratt. The funding is granted for a lecture of an applied nature dealing with the exploration and discovery history of a field or a subject having economic implications.

Her lecture will be "New Petroleum Reservoir Modeling Techniques Improve Field Management and Optimize Recovery."

□ **Lynn N. Hughes**, a U.S. District Court judge serving in Houston, is this year's AAPG Distinguished Lecturer

on Ethics.

Hughes will be available by request throughout the 2008-09 term, and will be the featured speaker on Oct. 28 at a luncheon in Cape Town, South Africa, during the upcoming AAPG International Conference and Exhibition.

His lecture topic is "Dilemmas of Trust."

This year's list of domestic Distinguished Lecturers also includes:

□ **Gerald Dickens**, professor in the department of earth sciences at Rice University, Houston. His tour of the eastern United States will begin Sept. 29, and he will offer two lectures:

✓ "Early Cenozoic Climate and Carbon Cycling: The Sedimentary Record of Global Warming and Massive Carbon Input."  
✓ "The Global Carbon Cycle with Seafloor Methane."

□ **Michael H. Gardner**, an associate professor at Montana State University, Bozeman, Mont., and geological adviser to Marathon Oil.

He will offer three lectures:

✓ "Evaluating Source to Sink Controls on the Permian Record of Deep-Water Sedimentation in the Delaware Basin, West Texas, USA."  
✓ "The Role of Outcrop Models in the Subsurface Characterization of Deep-Water Reservoirs."  
✓ "Geologic Considerations on Successful Deepwater Exploration and Field Development."

□ **Carmala N. Garzione**, associate professor in the department of earth and environmental sciences, University of Rochester, Rochester, N.Y.

She will be offering two lectures:

✓ "The Role of Outcrop Models in the Subsurface Characterization of Deep-Water Reservoirs."  
✓ "Modern Rainfall and Paleoclimate Across Northeast Tibet: Climate Consequences of the Growth of the Tibetan Plateau."

□ **Susan E. Humphris**, with Woods Hole Oceanographic Institution, Woods Hole, Mass.

Her lecture will be "Relation Between Volcanism, Tectonism and Hydrothermal Activity Along the Global Mid-Ocean Ridge System."

□ **Jim Jennings**, principal reservoir engineer, Shell International E&P, Houston.

He will be offering three lectures:

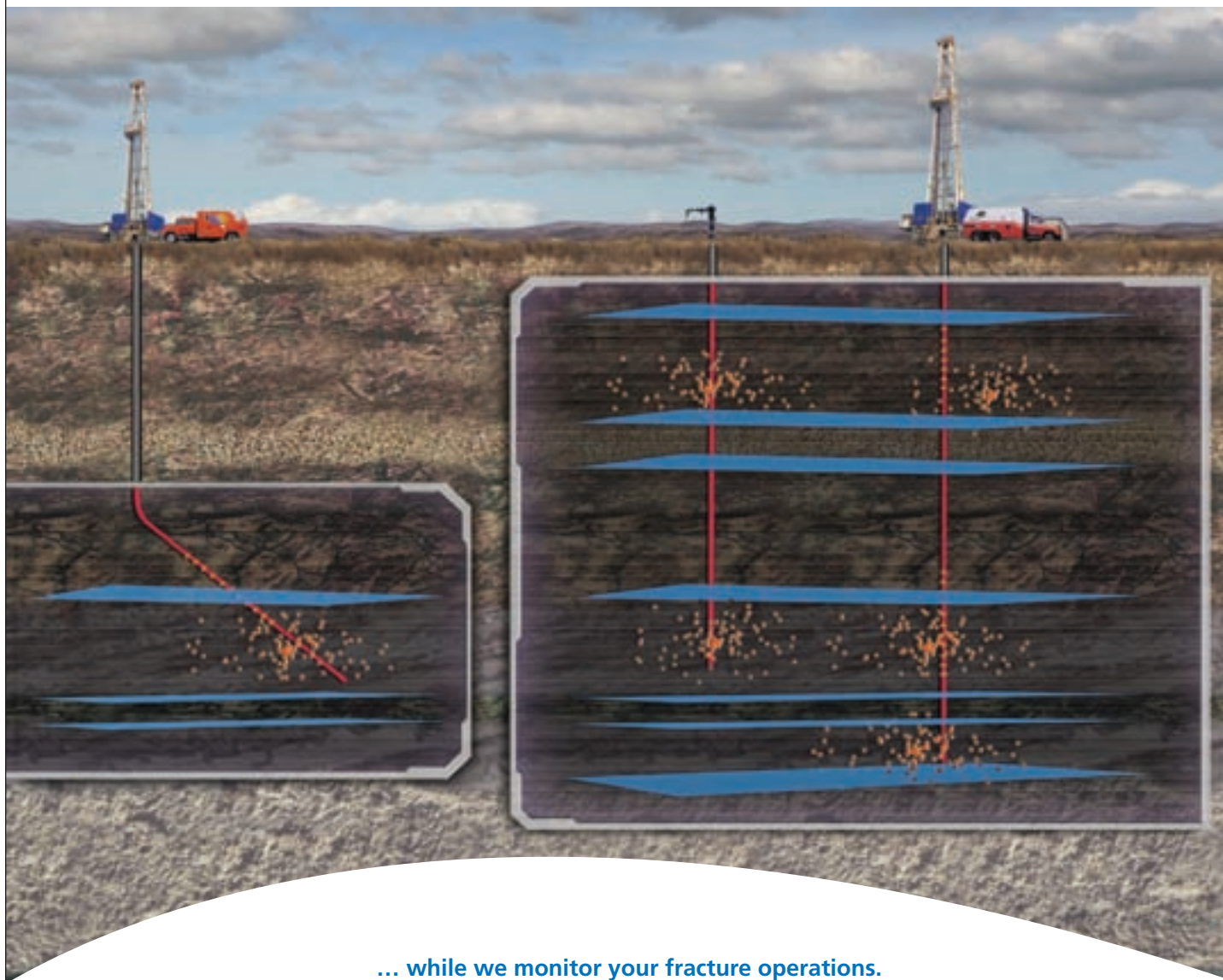
✓ "Petrophysical Variability, Fluid-Flow Behavior, and the Implications for Analysis and Modeling of Carbonate Reservoirs."  
✓ "A Geologist's Introduction to Permeability Averaging and the Effects of Scale on the Permeability of Heterogeneous Rocks."  
✓ "Fluid Flow in a Touching-Vug Cretaceous Carbonate Outcrop: Measurements and Models from Millimeters to Kilometers."

□ **Gene Rankey**, with the University of Kansas, Lawrence, Kan.

He will offer two lectures:

✓ "Controls on Sedimentology and Geomorphology of Holocene Isolated, Shallow, Tropical Carbonate Platforms: Bahamas and Beyond."  
✓ "Morphodynamics and Depositional Heterogeneity of Bahamian Holocene Ooid Shoals." □

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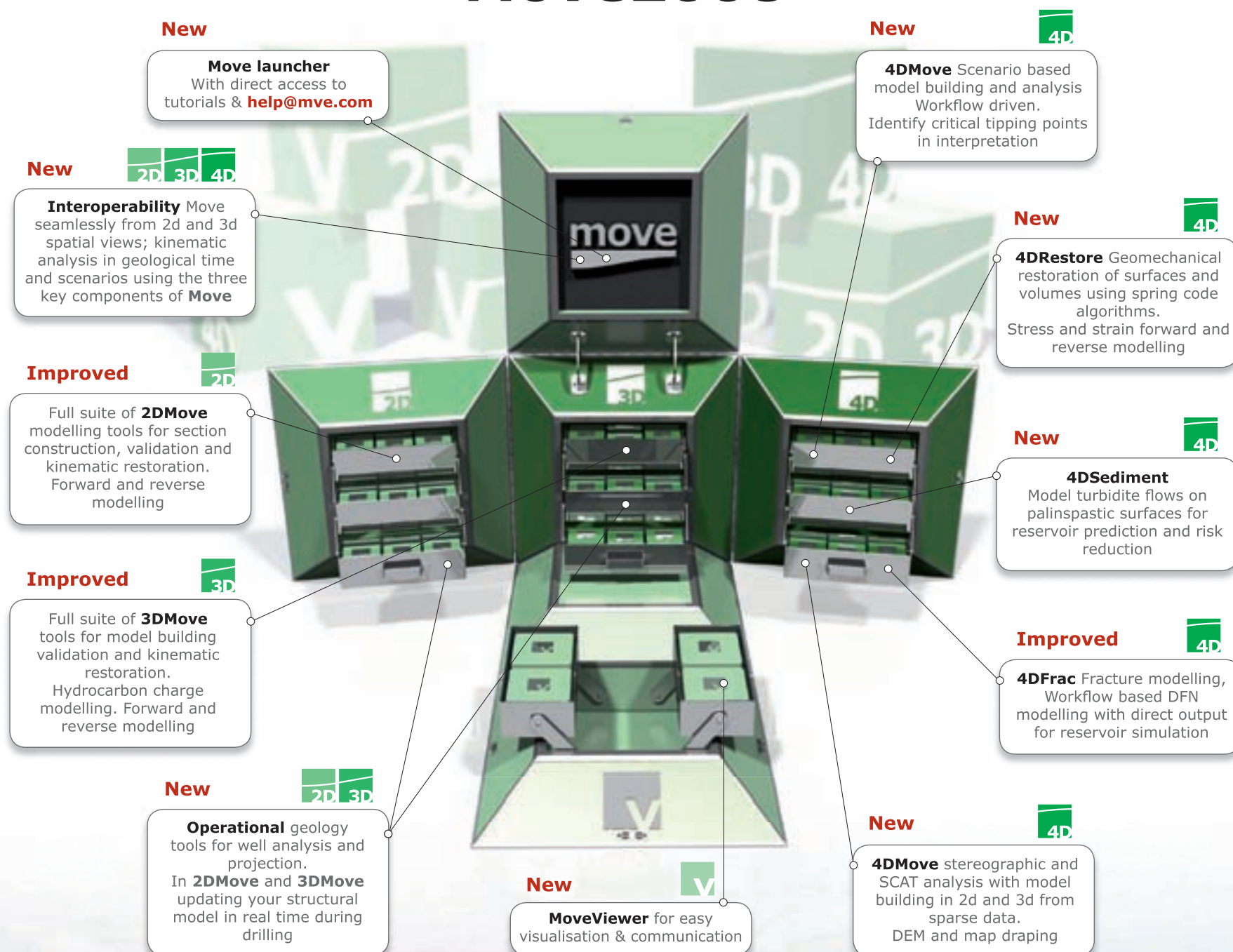
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## A travelogue

## Journeys a Part of DL's Stories

By PETER SKELTON

Early in 2007 I received a surprise telephone call from Gregor Eberli informing me that I'd been selected by AAPG as one of the potential Distinguished Lecturers to tour North America in the coming season, who asked if I would like to do that.

After a year's traffic of e-mails planning the schedule – and frantic packing late on Saturday night following a local choral society concert in which my wife, Vanessa, and I were singing – the adventure begins.

## Sunday (16)

Vanessa takes me to Bletchley station to start out for the airport, where I find that the train is delayed, though I am helpfully reassured by the lady in the ticket office that "planned engineering works usually do overrun on Sundays."

Despite this inauspicious start, I arrive at Heathrow in reasonable time. There, thanks to AAPG's generous travel arrangements, I find respite in the business class lounge, away from the milling, bored throngs abandoned to the clutches of Gucci, Harrods et al., in the "Departures Purgatory."

My flight is delayed by an hour, apparently because the flight crew have likewise suffered delays in getting to the airport, but we arrive in Ottawa, Canada, only some 20 minutes late, leaving sufficient time after all for me to catch my connecting flight to the first venue, St. John's, Newfoundland.

Surprise on arrival: this is one of the few places on Earth in a time zone with a half-hour difference from everyone else – hence, three-and-a-half hours behind U.K. time (good quiz question there).

It sounds so glamorous: Traveling all over the world, talking to groups about something you love – geology.

And, to be sure, being an AAPG Distinguished Lecturer is not just important because it is perhaps the world's premier vehicle for spreading the latest in geology, geoscience and geo-activities.

For the lecturer, it's important because there are personal experiences that are unforgettable.

It helps, however, when they take the

time to write down their experiences – which is exactly what Peter Skelton decided to do during his tours of North America last year as the Allan P. Bennison Distinguished Lecturer.

Exhilaration, anxiety, landscapes, snowstorms, triumph, tedium – it's all part of the job for AAPG Distinguished Lecturers.

Below, Skelton, a reader in paleobiology at the Open University, London, England, shares some of his diary with you.



Skelton

the west of St. John's.

Apparently there were strong historical links with Portugal for the export of cod, which presumably explains the presence of a splendid old Victorian table at the B&B with a top that I recognize as being made of Cenomanian rudist limestone from near

Lisbon.

On returning, I learn that Karen ... has succeeded in booking me onto a flight to Halifax that evening so that I can at least get back on track for my schedule the next day.

## Wednesday (19)

Yes! It's up at 5:15 a.m., in time to get to the airport for my flight to Boston, en route for Bowling Green, Ohio. U.S. Immigration and Customs do their bit at the Halifax airport, which saves time at the other end.

I have the usual slightly bizarre conversation that not-quite-normal people, such as geologists, have with the immigration officer:

"Why are you going to Ohio?"

"To give a talk."

"On what?"

"Fossils."

"They found some fossils here, you know."

"Oh yes – what sort? Dinosaurs?"

(Whoops! Dumb response; will they arrest me?)

"No, trilobites." (Better watch it – he

See **DL Diary**, page 36

## Monday (17)

My host from Memorial University, Greg Dunning, picks me up at 10:30 a.m. and we head for his department, where Rick Hiscott (who collaborated in an OU-based Lusitanian Basin project in Portugal directed by Chris Wilson back in the 1980s) shows me around and introduces me to various colleagues, some of whom give further warnings about the impending storm.

My talk on "The Episodic History of Cretaceous Carbonate Platforms: An Aptian Case Study," is attended by a responsive audience of 42, after which the threatened snowstorm begins, with winds later gusting to 90 mph. We decide to drive straight to the

airport to see if I can get out before it closes, but the last flight out has just left when we arrive and the evening flight is already cancelled.

The blizzard blows on through the evening, with the dry powdery snow providing an instructive speeded-up demonstration of dune migration.

Elliott Burden kindly calls by to take me out for dinner nearby. Being St. Patrick's Day – a state holiday here – we dine on a fine Irish stew washed down with Guinness.

## Tuesday (18)

As expected, everything is closed in the morning – the university included – buried under two to three feet of snow. Cocooned in my B&B, I log onto the Internet ... (and) the rest of the morning is taken up with a flurry of e-mails, both with Vanessa and my family and also with my "guardian angel" at AAPG, Karen Dotts, about "Plan B" for my schedule.

Later, Greg and Elliott kindly dig me out of the B&B and take me to lunch, the snowstorm having at last abated. We go to a little seaside restaurant in Portugal Cove, to



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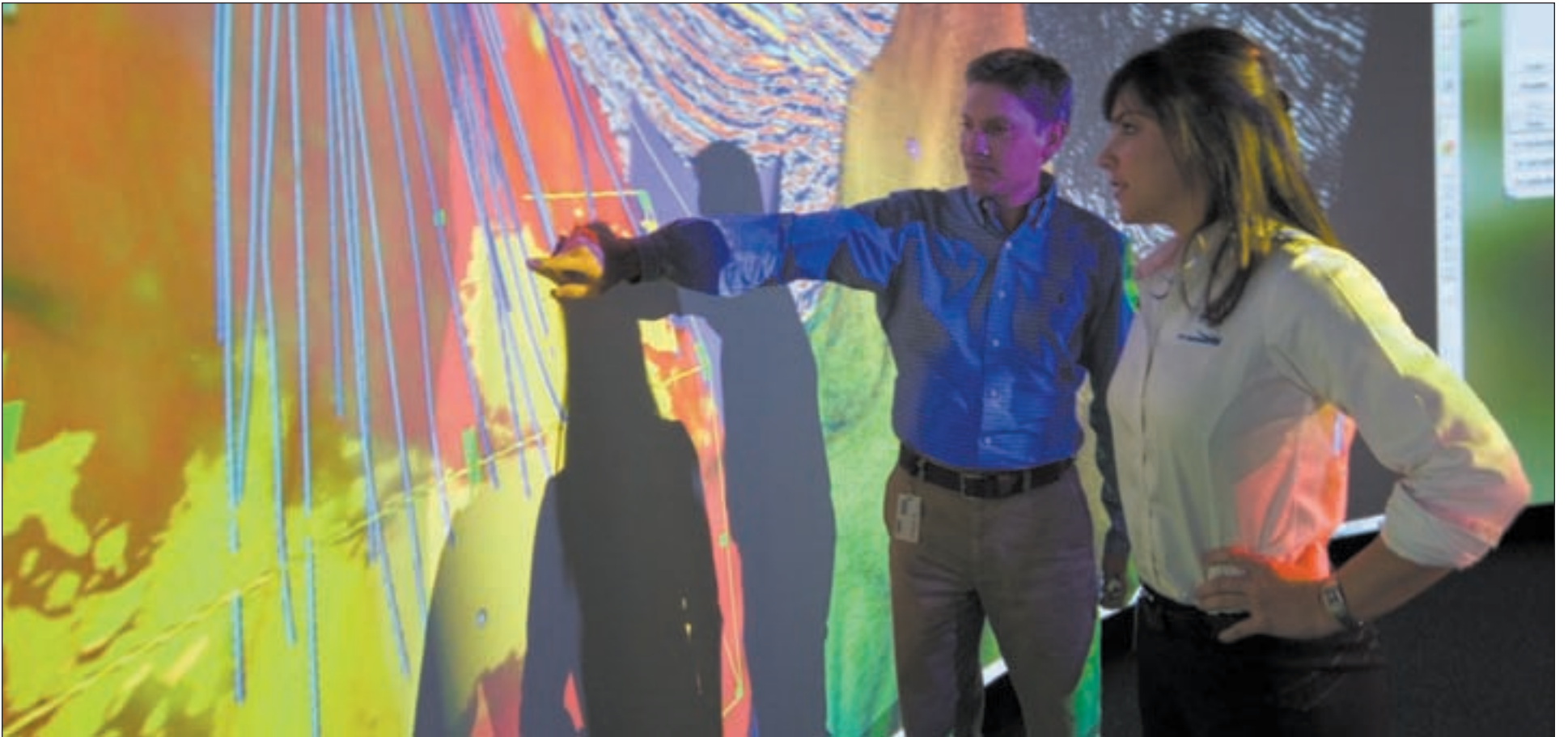
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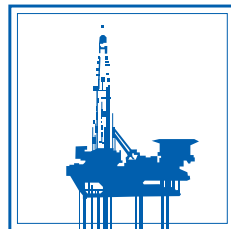
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## DL Diary

from page 34

knows his stuff!)

"Ah, well, I work on clams."

"But there ain't no clams in Ohio." (Ah! Trapped! Freshwater mussels may sound like wriggling)

"Er, they have fossil clams – but I'm not talking about them."

"OK, have a nice day!" (Phew – escaped the orange jumpsuit after all!)

I arrive in Boston to find that my connecting flight to Cincinnati is canceled; I am booked on a later flight, though it's going to be tight getting to Bowling Green in time for my talk there at 7 p.m.

I telephone Karen to update her – she'll advise Bowling Green accordingly.

So, nothing else to do but settle down to a nice clam chowder while I wait at Boston airport (plenty of clams there!).

On, then, to Cincinnati, where I am amused by one of those ubiquitous video ads for some anti-septic stuff that "kills 99.9 percent of all known germs: 'Imagine a touchable world!' If only they knew that every cell in our bodies is fueled by the activities of one-time (in the early Proterozoic) bacteria – mitochondria – without which we'd be dead.

But, hey! That's evolution and we're in Cincinnati – home of 'that' museum – so hush!

Next stop – Toledo (pronounced "Toleedo" here), with planes getting smaller (and bouncier) with each next leg of the journey.

I land at 5:38 p.m., hastily pick up my car and set off for Bowling Green, learning on the hoof how to manage its frighteningly sharp brakes without upsetting the "Duel" look-alike trucks behind me – and how to hold the freebie map.

Arriving at the campus with literally five minutes to go, I coolly enter the classroom

## Lecturers Begin Tours This Month

AAPG's Distinguished Lecture program for 2008-09 gets off to a fast start in September with four speakers starting their tours.

Those speakers slated to begin their tours are:

□ **Peter Duncan**, president of MicroSeismic Inc., Houston, and this year's AAPG/SEG Intersociety Lecturer, will begin a tour schedule will end in December and eventually cover at least nine countries.

His first tour dates are:

✓ Sept. 4 – New Orleans.

✓ Sept. 12 – Vancouver, Canada.

✓ Sept. 15 – Calgary, Canada.  
 ✓ Sept. 29 – Oslo, Norway.  
 ✓ Sept. 30 – Rijswijk, Netherlands.  
 ✓ Oct. 1 – Berlin, Germany.  
 ✓ Oct. 3 – Krakow, Poland.  
 ✓ Oct. 6 – Trieste, Italy.  
 ✓ Oct. 8 – Bucharest, Romania.  
 ✓ Oct. 10 – Athens, Greece.

□ **Jim Jennings**, principal reservoir engineer, Shell International E&P, Houston, will be speaking in the western United States Sept. 15-19.

□ **Carmala Garzione**, associate professor in the department of earth and

environmental sciences, University of Rochester, Rochester, N.Y., also will be speaking at western U.S. locations, from Sept. 29-Oct. 3.

□ **Jerry Dickens**, professor in the department of earth sciences at Rice University, Houston, will tour to eastern U.S. locations Sept. 29-Oct. 10, offering two lectures:

More information on all tour dates will be in future EXPLORERS and placed on the AAPG Web site at [www.aapg.org](http://www.aapg.org), as it becomes available. □

bang on 7 p.m. (eat your heart out, 007!) to find 30 eager faces waiting for my talk. Afterwards there's a small reception with a welcome assortment of nibbles and dips and lively chats with staff and students about their work (including some nice vertebrate paleo studies).

## Thursday (20)

Up at 4:45 a.m. to catch the early flight back to Cincinnati, for which we at last have some clear skies. From Cincinnati, it's on to State College, Pennsylvania, where I'm due to talk at Penn State at 4 p.m.

What a place! Set in a valley between impressively long fold-limb hills, the airport basically serves the university, which, with some 38,000 students, is the main thing hereabouts. The grand old 1930s hotel in which I am booked is owned and run by the university.

My talk (the 'Aptian' title) is well attended by about 40 people, with an interesting discussion of paleoclimate following on.

## Friday (21)

At last, I am able to get up at a decent

time and have a relaxed breakfast before my flights onward to Washington, D.C. Lovely weather, again, with a strategic window seat providing some spectacular views of folds in the Pennsylvanian as we take off.

## Monday (24)

This time, it's my other talk, "Rudist Evolution, Ecology and Environments" that I give to a select audience of about 20 paleobiologists, though I also briefly run through the "Aptian" talk a little later for some with particular interests in that topic ... Flight times in America seem to be about as reliable as train times in Britain. My rudist colleague of long-standing, Bob Scott, is patiently awaiting my arrival at Tulsa airport near midnight and we head off to his house for the night.

## Tuesday (25)

Fueled on a magnificent breakfast *chez* Scott, we briefly survey the impressive destruction of local trees by a recent, devastating ice storm in the Tulsa area (interesting – not something I'd seen in Britain). Bob has fixed a schedule for me to

meet with all the staff members of the AAPG geosciences department, with each of whom I have plenty of time to chat and learn about their wide-ranging interests, including a developing research strand in microbial geobiology.

## Home Again

All in all an interesting, if somewhat exhausting, trip, meeting up with many new faces as well as old friends, learning lots about what they're up to and, I hope, giving them in return some food for thought from my own work.

Many thanks indeed to AAPG for sponsoring the trip – and especially to Karen Dotts for organizing it, as well as to all my kind hosts along the way who welcomed me with such warmth and generosity. □

For more text and photos of the Distinguished Lecturer's Diary, visit the AAPG Web site.



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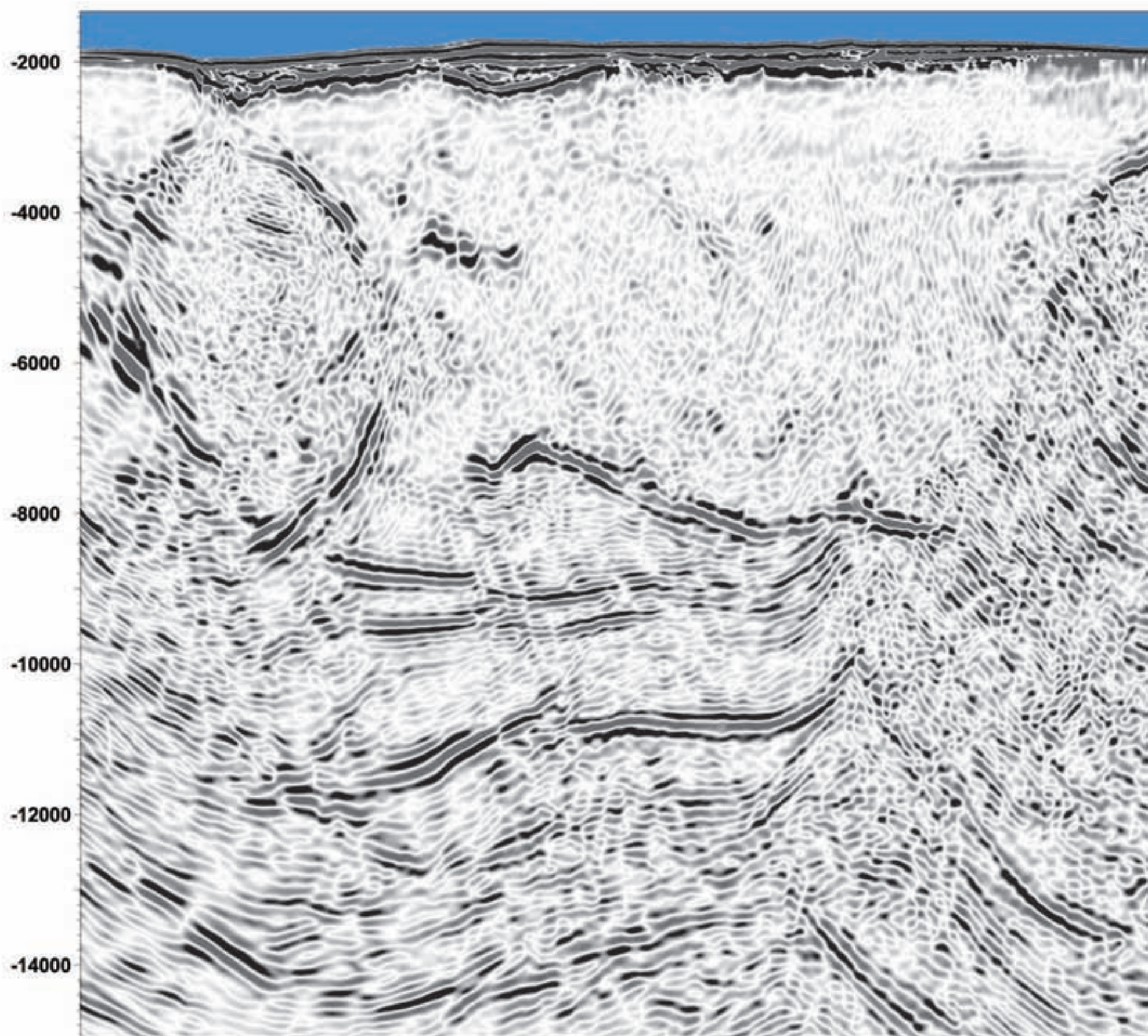


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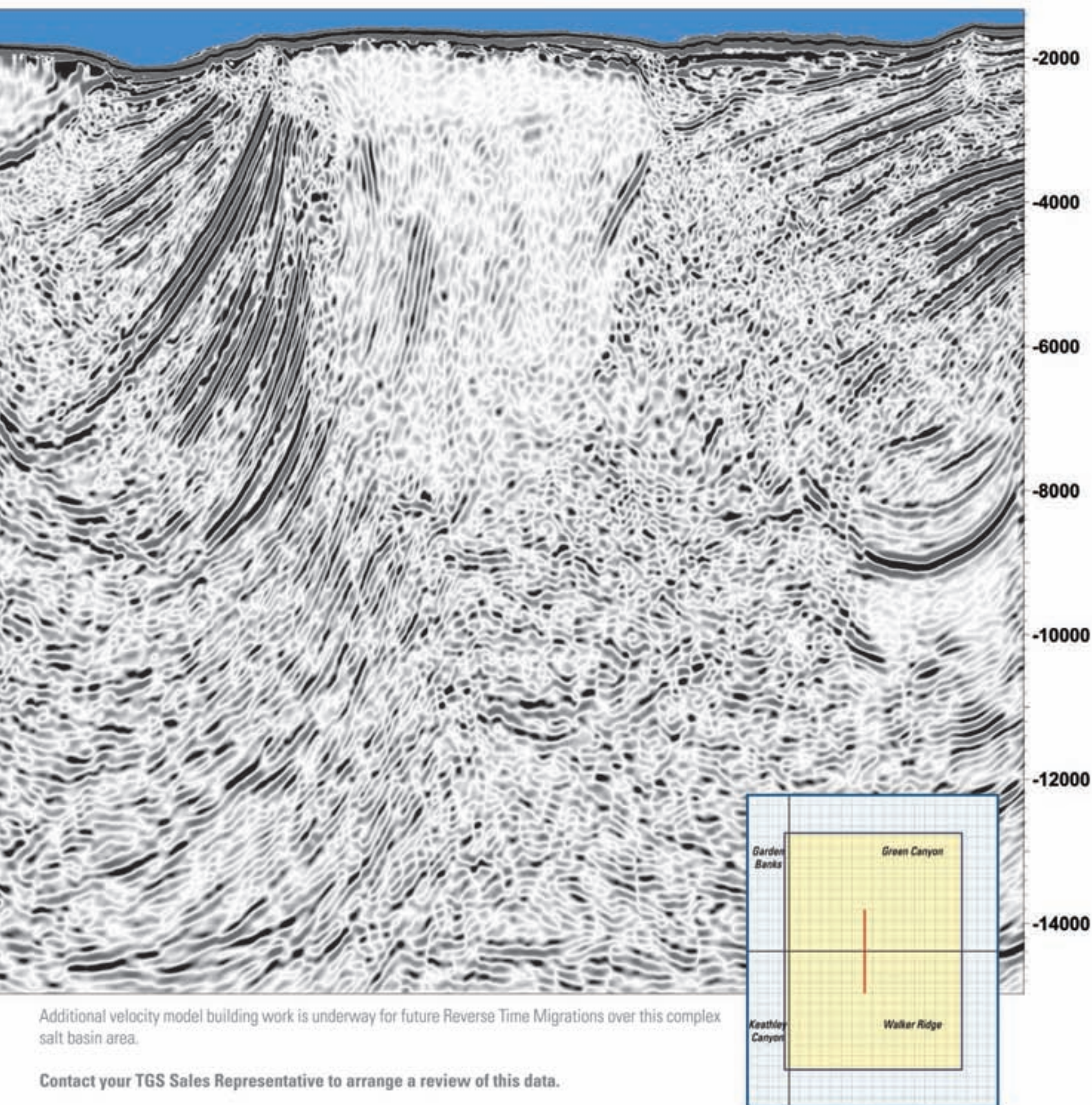
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## Rename Holocene?

# 'Anthro' to be Epoch Discussion

By KEN MILAM

EXPLORER Correspondent

You say Holocene, I say  
Anthropocene.  
Or not.

Two AAPG authorities say the renewed buzz for naming a new epoch in earth history seems premature.

A pair of recent papers in international publications call for naming a new epoch – the Anthropocene – acknowledging the wholesale impact humans have had on the planet.

One paper, published in the February issue of *GSA Today*, suggests the last 200 years of industrialization will provide an undeniable stratigraphic marker for future geologists.

Some of the effects cited include climate change, major changes in soil erosion and deposition patterns, changes to the carbon cycle, ocean acidification, altered flowering times among plants and new animal migration patterns.

The other paper, published in the journal *Soil Science*, pushes the dawning of the Anthropocene back a few thousand years to the beginnings of agriculture and a resulting decline in soil fertility.

Nobel chemistry laureate Paul Crutzen coined the term Anthropocene in 2000, and the similar Anthrocene was bandied about by scientists as early as the late 1800s, according to an article in the online publication Live Science.

So it's really not a new idea – unless you're speaking in geological terms.

**“The problem is scale, On an anthropological time scale, it makes sense to acknowledge massive human intervention.” On a geologic scale, however, “it’s really insignificant.”**

### Defining the Boundaries

That's one of the things that concerns Don Owen and Art Donovan, AAPG members on the North American Committee for Stratigraphic Nomenclature.

Massive human intervention on the planet may be undeniable, but “it's not going to show up on a geological time scale” yet, Owen said.

When the earth's entire history is presented graphically, as on a timeline, “You can barely see the Holocene,” Donovan said. Measured from the end of the last Ice Age, the Holocene is generally measured at 10,000 years old and encompasses all human activity.

Another problem with declaring the end of the Holocene is that “nobody agrees on the boundaries” for the new epoch, said Owen, chair of the AAPG

delegation on the NACSN and a subcommittee member of the International Commission on Stratigraphy, the final arbiter for naming rocks and times.

Donovan agreed that “proponents can't agree” where to draw the line.

“Even the guys pushing it are all over the place,” he said.

Suggestions include 1874 (marking the invention of the steam engine), 8,000 years ago at the beginning of agricultural activity or perhaps the extinction of some key species linked directly to human activity.

Owen said the beginning of the Cambrian Age is pegged at 542 million years ago, and earlier epochal divisions are less specific, based on broader data or fossil records.

In more recent times, geologists are able to see changes more clearly, he said.

Experts talk of driving a “golden spike” into the rocks where major changes, such as extinctions, are delineated, he said.

“We know the fossils on both sides ... and have good radiometric data,” Owen said.

Donovan said deciding what physical data to use – continental, marine, ice cores – can be a concern.

An unsettled debate regarding the 1.8 million-year-old Quaternary Period, or era, is an example, Donovan said.

continued on next page

### Articles Revived Question

The *Geology Today* paper referred to in the accompanying article was written by a group of 21 researchers from the Geological Society of London.

The scientists, led by Jan Zalasiewicz at the department of geology at Leicester, say:

“Sufficient evidence has emerged of stratigraphically significant change for recognition of the Anthropocene –

currently a vivid yet informal metaphor of global environmental change – as a new geological epoch.”

The article in the December 2007 issue of *Soil Science* was written by Daniel Richter of Duke University, whose work was supported by the National Science Foundation, U.S. Department of Agriculture and Andrew W. Mellon Foundation. □

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## AAPG's voice heard

# So, What's in a Name? A Lot

By KEN MILAM

*EXPLORER Correspondent*

Authority for naming rocks, formations and times rests with the International Commission of Stratigraphy.

The ICS is the largest scientific body within the International Union of Geological Sciences and the only organization concerned with stratigraphy on a global scale. Much of its work is done through a network of subcommissions and working groups with specific, limited mandates.

The ICS has about 400 titular members, with over 2,000 stratigraphers worldwide participating in its activities.

The North American Commission on Stratigraphic Nomenclature was established in 1946. It sets rules for naming geofoms and recommends them to the ICS.

The Commission comprises:

- ✓ Three representatives each from AAPG, the Association of American State Geologists, the Geological Society of America, the U.S. Geological Survey and the Geological Survey of Canada.

- ✓ Two each from the Canadian Society of Petroleum Geologists and Geological Association of Canada.

- ✓ One each from the Asociación Mexicana de Geólogos Petróleros, Sociedad Geológica Mexicana, and Instituto de Geología de la Universidad Nacional Autónoma de México.

- ✓ In addition, there are two commissioners-at-large.

Representatives serve three years, with staggered terms. Chairman and vice chairman are elected from within the Commission membership, and each serves one year.

The NACSN meets for one-half day during the GSA annual meeting. Work in



Owen



Donovan



Jordan

the meantime is done mostly by e-mail, according to Don Owen of Lamar University, who chairs AAPG's three-person delegation.

AAPG's voice on the Commission "is pretty prominent," Owen said.

While some societies regularly

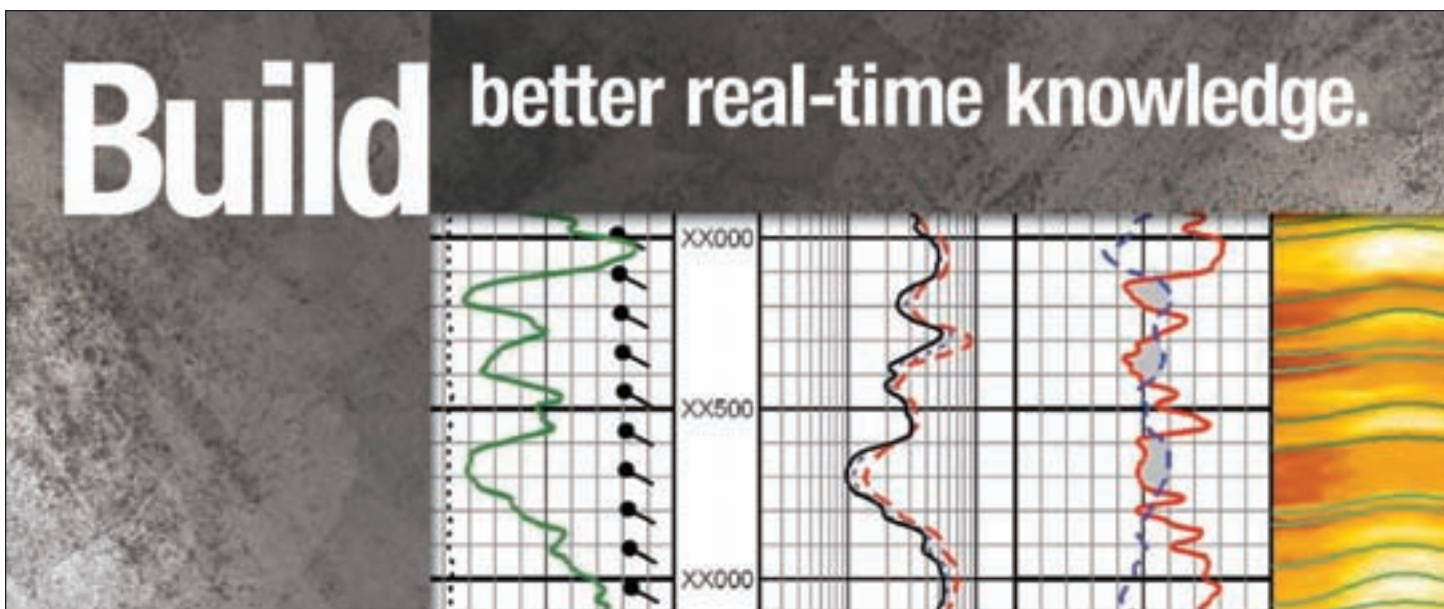
appoint new members, AAPG tends to reappoint representatives. Owen has served on the body for 25 years.

"The ICS rules on names; the NACSN submits opinions," he said.

Fellow member Art Donovan of BP, Houston, said the body includes a mix of scientists from academia and industry.

"We try to provide an industry perspective," he said.

AAPG's third member is Robert R. Jordan, an AAPG Honorary member from Yorklyn, Del. □



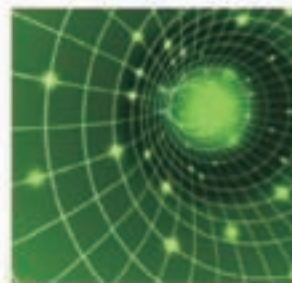
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continued from previous page

"There's no evidence in the marine record," he said. "The paleomagicians can't see anything that ties in."

Sometimes opinions split along academic vs. industry lines, Donovan said.

### A Matter of Scale

The decades-long controversy points at the problem in gaining consensus and shows why some scientists don't see the urgency in naming a new epoch.

"The problem is scale," Donovan said. "On an anthropological time scale, it makes sense to acknowledge massive human intervention."

On a geologic scale, however, "It's really insignificant," he added.

Owen said the term "age" might be more acceptable than "epoch" for the young Anthropocene.

"Sometimes things change in rank," he said, adding that soil infertility "may be one of the best arguments" in favor of naming a new age.

"If you're talking about anthropology, then you can do something like this," Owen said.

In the end, the question is whether the term becomes widely accepted by the scientific community," he said.

"Sometimes informal terms get recognized," he said. "Just because there's a difference of opinion doesn't mean it's wrong." □





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## Exploration successes

# Energy Needs Drive India Industry Role

By KEN MILAM  
EXPLORER Correspondent

The energy needs of one billion souls pose mighty challenges for India.

Booming consumption, new technology and major new discoveries make the rapidly developing subcontinent an increasingly attractive target for exploration.

GEO India 2008, scheduled Sept. 17-19 at the newly built India Expo Centre EXPO XXI in Greater Noida, New Delhi – with major support from AAPG and cooperation of several other societies – is the first major scientific conference to examine India for a global perspective, according to Dinesh Kumar Pande, director of exploration for India's Oil and Natural Gas Corporation, and Organizing Committee Chairman of GEO India 2008.



Pande

Pande recently carved time from his busy schedule to respond to wide-ranging questions from the EXPLORER regarding the conference and India's evolving role in the world's energy and exploration future.

### EXPLORER: Would you discuss India's place in today's global energy future?

PANDE: The world uses a wide variety of energy today and consumed about 11 billion tonnes oil equivalent of primary energy in 2006, 21 percent of which was consumed by the United States, followed by China with 16 percent. India is the fifth largest consumer with almost 4 percent of share at 423 million tonnes of oil equivalent consumption (oil, gas and coal).

During the last quarter century (1980-2006), primary energy consumption increased by about 64 percent (from 6.64 BT to 10.89 BT); oil by 31 percent (from 2.96 BT to 3.89 BT); and gas by a whopping 98 percent (1.45 TCM to 2.87 TCM), primarily driven by growing demand from the developing world.

Per capita primary energy consumption in India is 0.38 TOE against the global average of 1.29 TOE; one of the lowest in the world. In Canada it is 9.89 TOE, followed by 7.76 in the United States, and then Russia, U.K., France, Japan, Germany, South Korea and China, etc. China has maintained consumption less than global average despite its large population base. It is evident that hydrocarbons would continue to hold a significant position at least for the ensuing two decades, with marginal impact on account of both conservation measures and a mix of new technology and alternate drivers.

Most forecasts for the next quarter-century project a more than 60 percent increase in energy demand, mainly from emerging consumption centers. India's demand for primary energy in 2030 is projected to be four-times what we are consuming today (423 MTOe). In addition, it is estimated to be in the range of 350 to 450 MMT of oil, 100 to 200 MTOe of gas and 600 to 1,000 MTOe of coal. So, oil, gas and coal would continue to be dominant fuel at that point of time also.

Presently just nine countries account for 95 percent imports of crude oil. Among these countries, China, the United States and India are currently having robust

growth. In case of supply constraints India will have to compete with these countries for the limited oil supply.

### How do you assess India's energy future?

As India is preparing to reach higher economic growth levels in all spheres in the new millennium, energy challenge is of fundamental importance to the country's growth imperatives.

Energy needs recognized focus areas along with agriculture, poverty alleviation and education. The share of commercial energy in the total primary energy consumption in the country has grown from 28 percent to 65 percent over the last 50 years. Likewise, among the commercial energy resources, the dependence over coal has reduced from 86 percent to 55 percent, while oil/gas have grown from a meager 13 percent to 41 percent. In fact, gas entered the scene in the 1980s, and in a short span of 20 years it has come to occupy 7 percent of the commercial energy supply to the nation.

These changes bring out clearly that coal still dominates as a commercial energy source; however oil/gas would take up the second position.

The hydro and nuclear options do not substantially contribute to the energy needs as of now, and despite the move forward with regard to the nuclear deal, India is unlikely to upscale its activities in this field to cover any substantial ground in the immediate future.

If oil and gas are available at affordable prices and in sufficient quantities, then India is poised to follow the suit of developed countries with oil enjoying largest share of commercial energy sources and gas accounting for more than 20 percent.

However, if oil and gas face supply constraints due to "peak oil" limiting the growth in oil production and subsequent price escalation due to many bidders for the limited oil production, India will be forced to find a new paradigm for development and growth wherein main energy source would not be hydrocarbon.

### In terms of exploration how much is going on today in India? How is this different from the past? What and where are the "hotspots" of exploration?

Exploration in India has gained momentum recently thanks to several policy initiatives by the government of India, like introduction of NELP, which calls for completion of exploratory programs in a time bound manner. This has also brought in several global and home-grown players, and also has set a healthy environment for knowledge sharing.

(The number of) offshore seismic surveys here are amongst the highest in the world (both 2-D and 3-D). Land crews, both in-house for companies like ONGC as well as service providers, probably would be in excess of 50 deployed in various parts of the country in the acreages under lease.

Until recently (about 2000) there was hardly any deployment through service providers. Huge increases in offshore seismic surveys are largely because of the introduction of NELP with various operators being involved in the E&P

See **India**, page 44



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## India

from page 42

business.

National companies almost completely dominated the E&P scenario in the country, but some recent ventures have been witnessed by private operators, like Reliance Petroleum, who established one of the world's largest gas fields in 2002 in the east coast. Smaller operators have now entered the field, like the Scottish company Cairn, which have been successful in opening up new areas in the onshore sector like Rajasthan.

The Iran-Pakistan-India pipeline, a land-based route that is in the offing, would undoubtedly make India a major gas consumer.

The country's hot spot for exploration is the eastern offshore province largely comprising the Bay of Bengal along with the Andaman Sea – not only because the deepwater exploratory successes there are sizeable today and in all likelihood would continue to provide larger field sizes, but also because it would challenge all G&G and engineering skills in the deep- and ultra-deepwater sector.

*What are the biggest challenges facing India's oil and gas exploration today (geological, political, financial, logistic, etc.)*

India is politically a very stable country, offering one of the best possible environments for exploration with a stable fiscal regime and protection of contractor's interests. With an overall GDP growth of around 8 percent and ruling high oil prices, allocation of funds for exploration also has not been a problem.

However, it is a known fact that cost of exploration is rising, and with the prevailing energy challenge there is hardly any

GEO India 2008, a new event set in a country that is at the center of global energy headlines, will be held Sept. 17-19 at the newly constructed Expo XXI in Greater Noida, New Delhi, India.

GEO India, following the successful model set by the GEO Bahrain conferences, will feature a large exhibitions hall and an extensive technical program built around the theme, "Investing in Geoscience to Secure the Future."

AAPG is a co-organizer with the Association of Petroleum Geologists-India, the Society of Petroleum Geophysicists-India and the Society of Petrophysicists and Well Log Analysts-

margin for error. Accuracy and precision therefore is name of the game.

Technology will be needed to help overcome challenges in every sphere. Field growth opportunities and near field exploration for established plays in the producing basins are peaking. As geoscientists, the onus is on us to find more oil, which we believe to be in older stratigraphy at deeper depths.

There has been an explosion in technology but areas of concern remain, including imaging of deeper objectives, sub-basalt imaging, time and depth domain resolution, reservoir characterization and fluid prediction, pore pressure prediction, tackling harsh sub-surface conditions and exploration for unconventional plays like shale gas and basin centered gas.

The foremost challenge would be to reduce the API cycle time. Advancements in processing technology can bridge this, especially when processing technologies and computing capacities are evolving in

India.

The large program will cover the region's geology, exploration activities, technology and public policies, and include sessions on:

- ✓ Petroleum Systems and Basin Analysis.
- ✓ Deep Water Slopes and Basin Systems.
- ✓ Structural Entrapment and Hydrocarbon Plays.
- ✓ Sediment Logical Processes and Stratigraphic Models.
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- ✓ Alternate Energy Developments in the 21st Century.
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- ✓ Hydrocarbon From Shale and Coal.
- ✓ Geospatial Technology and Astrogeology.
- ✓ Student Presentations.

Registration and details are available online at [www.geo-india.com](http://www.geo-india.com). □

leaps and bounds.

A world-wide shortage of deepwater rigs also has had its share of effect on the current exploration plans in India, forcing delays in implementation of several programs.

#### What are your expectations for GEO India?

For the first time three Indian geoscience societies, namely the Association of Petroleum Geologists (APG), Society of Petroleum Geophysicists (SPG) and Society of Professional Well Log Analysts (SPWLA) are coming under one umbrella and partnering with AAPG to launch a truly international E&P conference and exposition series in India under the name GEO India.

In India there have been numerous conferences organized by Indian societies dedicated to specific domain area of E&P with limited international participation – but we felt a need to have an event covering the entire E&P span and extensive global

participation of geoscientists. GEO India will precisely provide this opportunity to the geosciences fraternity.

The technical program offers 21 oral sessions covering more than 90 high quality presentations, 30 plenary and keynote speeches and more than 150 poster presentations.

GEO India ... will address not only new developments and applications in geology, geophysics and geochemistry, but also some overarching issues such as the future potential of hydrocarbons.

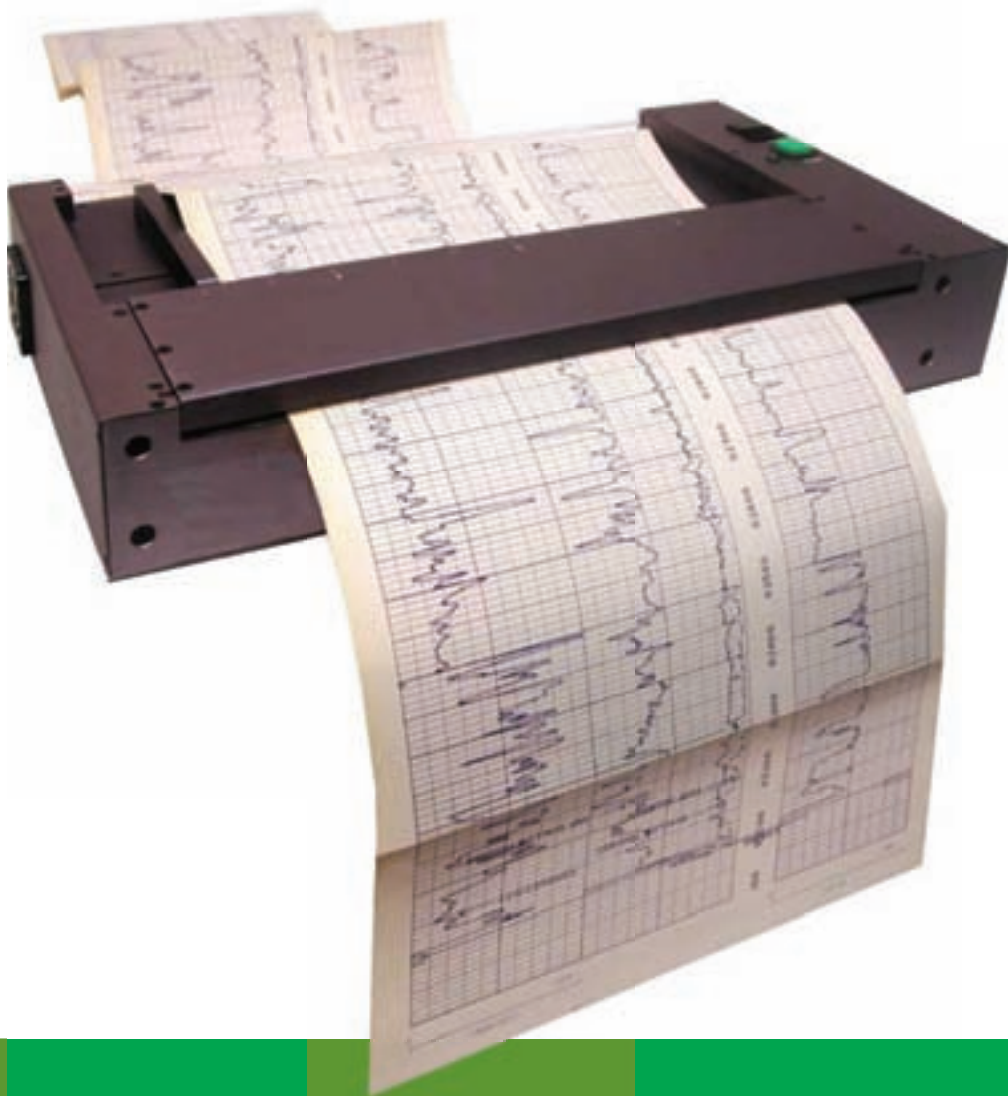
The conference will provide a platform for ultimately contributing to the ongoing expansion of E&P activity in India and the throughout South Asia.

Also, the conference is strongly supported by the government of India.

For more information on this subject, visit the AAPG Web site.

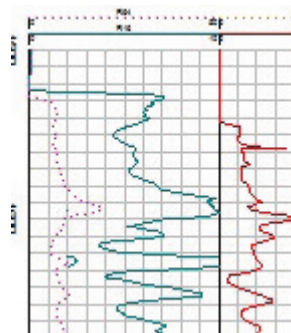


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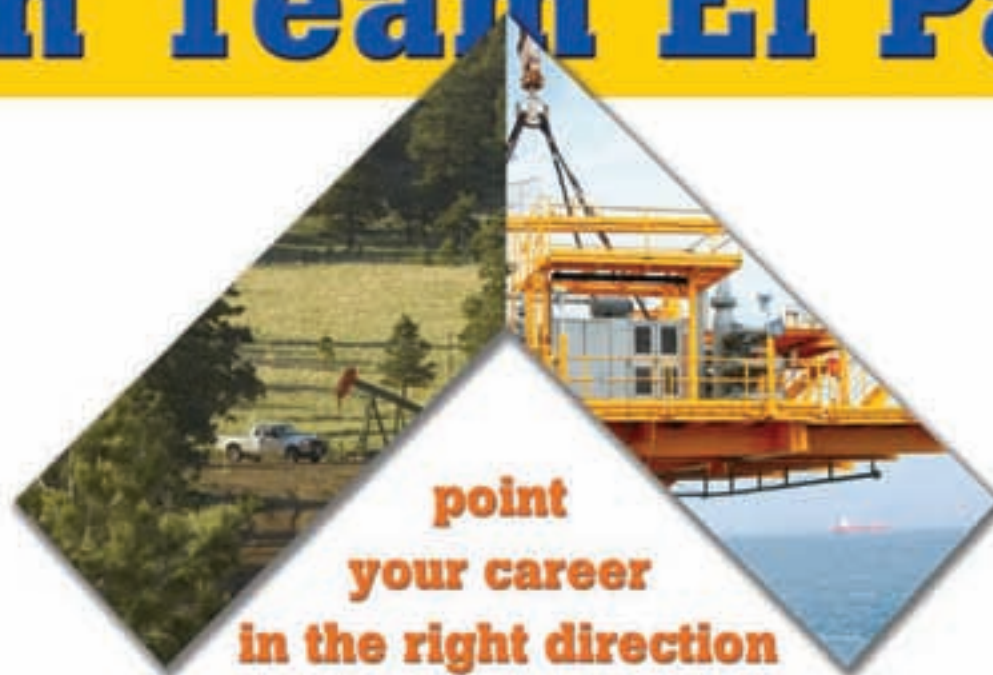
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*Some news, some advocacy***Internet TV Includes Energy Niche**

By LARRY NATION

AAPG Communications Director

On a hot July afternoon, AAPG Executive Director Rick Fritz was in front of a camera in the television studio of a Tulsa CBS affiliate wearing an earpiece microphone, answering questions from an interviewer in Washington, D.C., concerning the "drill it or lose it" discussions in Congress.

The questioner speaking into his ear was Susan McGinnis, formerly of the CBS Morning Show, who is now the lead on-air personality for CleanSkies.tv, an internet-only "television station" dedicated to energy issues.

Viewers who logged-on to the no-cost site saw the interview live, much as a viewer watching CNN news.

As technology morphs our computers into television sets, Fritz was part of a quickly evolving "niche-ing" of audiences that share an affinity for various topics.

With the avalanche of information prompted by technology capabilities, studies are showing that we have to sift through the fog to get what we want – when we want it.

With this newly evolved need, content providers are tapping broadband computer/television technology to provide focused information to affinity-bonded audiences. The result is an explosion of new broadband Internet sites over the past 12-18 months.

Some of the recent sites feature polished productions with the look and feel of a network news or talk show format, with "name" personalities hired to provide content and give an aura of objectivity.



AAPG Executive Director Rick Fritz on the set for a recent remote interview for Internet TV.

EXPLORER photo

They include:

✓ **Energy-TV.com** of Calgary, which began in 2006 as a half-hour "regular" television program that airs every week on Global Television in Calgary, Edmonton and Red Deer, and on the ABC Network in Houston.

The episodes are available for viewing on the Internet. The producers say the show attracts about 50,000 viewers and focuses on trends and issues rather than breaking news.

✓ **TheEnergyNews.com**, also in Calgary, was launched in April. It offers breaking news, on-demand broadband television newscasts available 24/7 plus interviews and special reports.

Both Calgary sites are advertising-based business models.

✓ Also funded by advertising dollars is **Energypolicytv.com**, which adds content daily and covers the spectrum of energy issues and touts that it will "provide full coverage of all Congressional hearings on energy and the environment" – kind of a C-SPAN for energy that also features interviews and in-depth reports.

Energypolicytv.com estimates 30 percent of their page views are from government users, 40 percent from industry and the balance from non-governmental organizations, the press and colleges and universities.

It reported 219,752 page views in March 2008.

✓ **CleanSkies.tv** news, launched on Earth Day 2008, follows a different business model – it is mainly funded by private funds based on advocacy efforts.

The site is sponsored by the American

Clean Skies Foundation, a Washington, D.C., think tank devoted to advancing the use of natural gas (June 2008 EXPLORER). The foundation and the broadband side is funded by Chesapeake Energy, the largest independent producer of natural gas in the United States. Aubrey McClendon is chairman of Chesapeake Energy and CEO of the American Clean Skies Foundation.

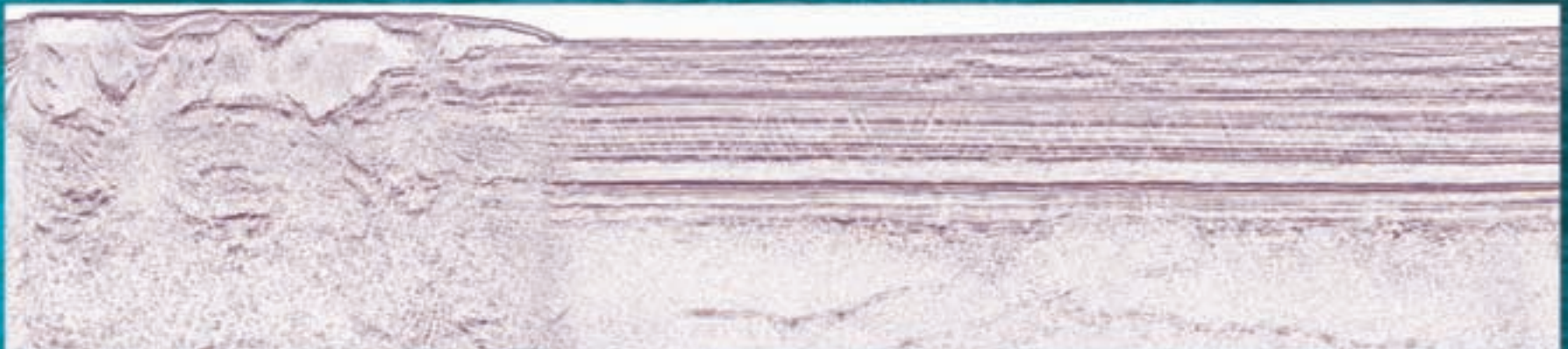
✓ Speaking of niches, even a sedimentary formation is getting its own computer/TV site. But not just any sedimentary rock – it's the rock star Barnett Shale.

Chesapeake also recently announced it was sponsoring **Shale.tv**, devoted exclusively to creating content about the Barnett Shale, which has come under criticism and faces regulatory roadblocks due to the urban proximity to much of the production. A well-known Fort Worth television news anchor has been hired to produce daily programming. Both CleanSkies.tv and Shale.tv are supplemented by full-color publications with plans for distribution twice yearly.

CleanSkies.tv and Shale.tv are both operated by Branded News, a subsidiary of Ackerman McQueen, an Oklahoma City-based advertising agency that also operates a broadband site for the Oklahoma Tourism Commission ([www.oklatravelnet.com](http://www.oklatravelnet.com)) and the National Rifle Association ([www.NRAnews.com](http://www.NRAnews.com)).

The ad agency also was operator of Energy News Live (November 2000 EXPLORER), one of the pioneer broadband

See **Internet TV**, page 51

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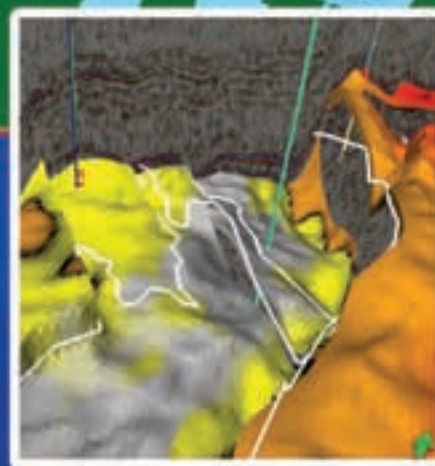


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## GEOPHYSICALcorner

## Options Exist for Surface Problems

(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 is the second of a two-part look at "Exploring Beneath High-Velocity Surfaces.")

By BOB HARDAGE

Last month in this space we showed that in areas where poor-quality seismic data are acquired across a high-velocity surface with surface-based geophones, good-quality reflection events are created at deep interfaces below this high-velocity surface layer.



Hardage

Because good-quality reflections head upward toward the earth's surface, why do we not capture these reflections with earth-surface receivers?

This month we will look at what appears to be the cause of this poor data quality – and consider one option for resolving the imaging dilemma.

\* \* \*

The culprit that prevents the capture of good-quality reflection events often seems to be severe, unorganized ground-roll noise.

The earth model in figure 1 will be

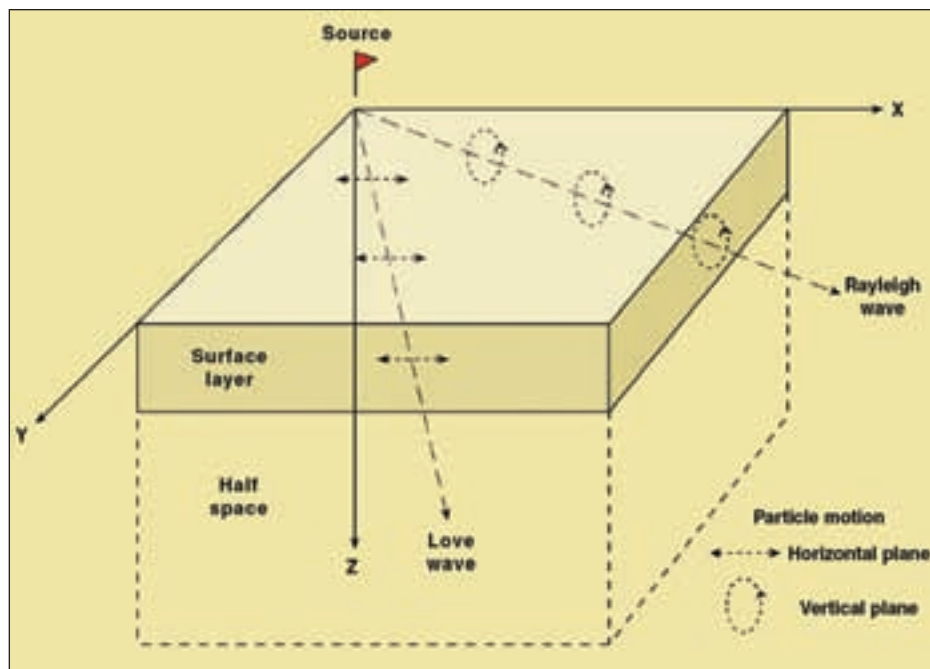


Figure 1 – Earth model illustrating the two types of surface-wave noise modes (a Rayleigh wave and a Love wave) that can propagate along the Earth-air interface.

used to illustrate the wave physics. There are two kinds of surface waves that travel horizontally away from a source station and spread across the earth-air interface:

✓ One surface wave is the Rayleigh mode, created by any surface-based source that produces a vertical displacement. Almost all onshore seismic sources (vertical vibrators, explosives in

shotholes, weight droppers, etc.) create a vertical displacement and thus produce a Rayleigh wave.

The common term used for a Rayleigh wave is "ground roll." The particle motion associated with a Rayleigh wave is a vertical, retrograde, elliptical motion as shown in figure 1.

✓ The second surface wave that can

propagate along the earth-air interface is a Love wave, which can be generated only by an SH shear source that creates pure horizontal displacement, and the wave propagates horizontally as a pure SH shear mode that produces no vertical displacement (figure 1).

Of these two surface waves, the Rayleigh mode is the "bad" noise mode when the surface layer has a fast seismic propagation velocity. The Love wave is the "good" noise mode. You just have to love the Love wave when you operate in an area having high-velocity outcrops.

\* \* \*

Why is the Rayleigh ground roll so troublesome across outcropping basalts and carbonates?

For most poor-data areas, the answer is that the exposed high-velocity layer usually has a rough surface and numerous large internal voids (see figure 1 of last month's article), and these randomly positioned irregularities cause the ground roll to backscatter from many azimuth directions and at many different time delays to create a continuous overprinting of high-amplitude, unorganized noise on top of the deep reflection events that arrive at each surface receiver.

Because this noise is unorganized (i.e., it does not arrive from a fixed direction, and its components have

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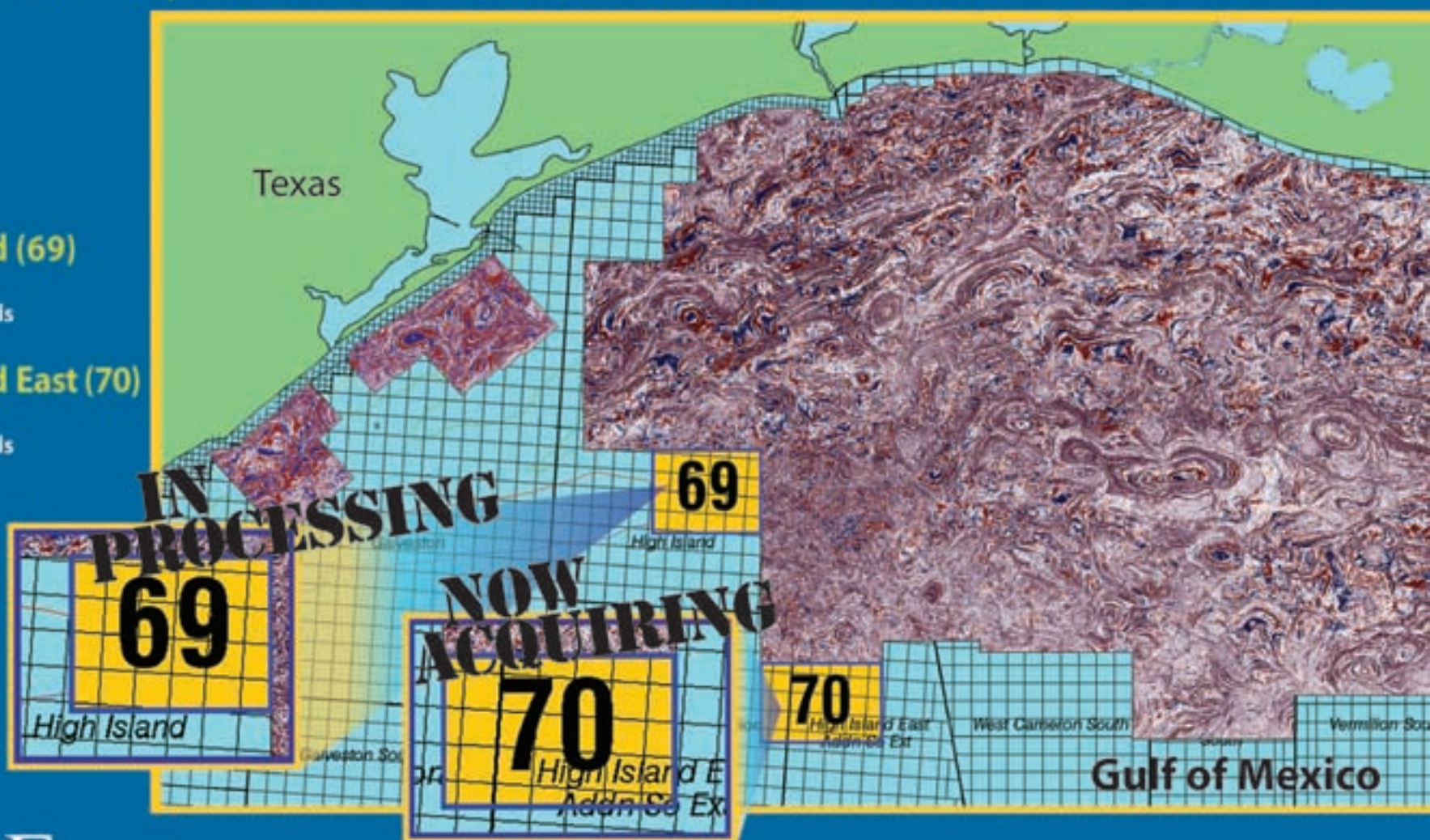
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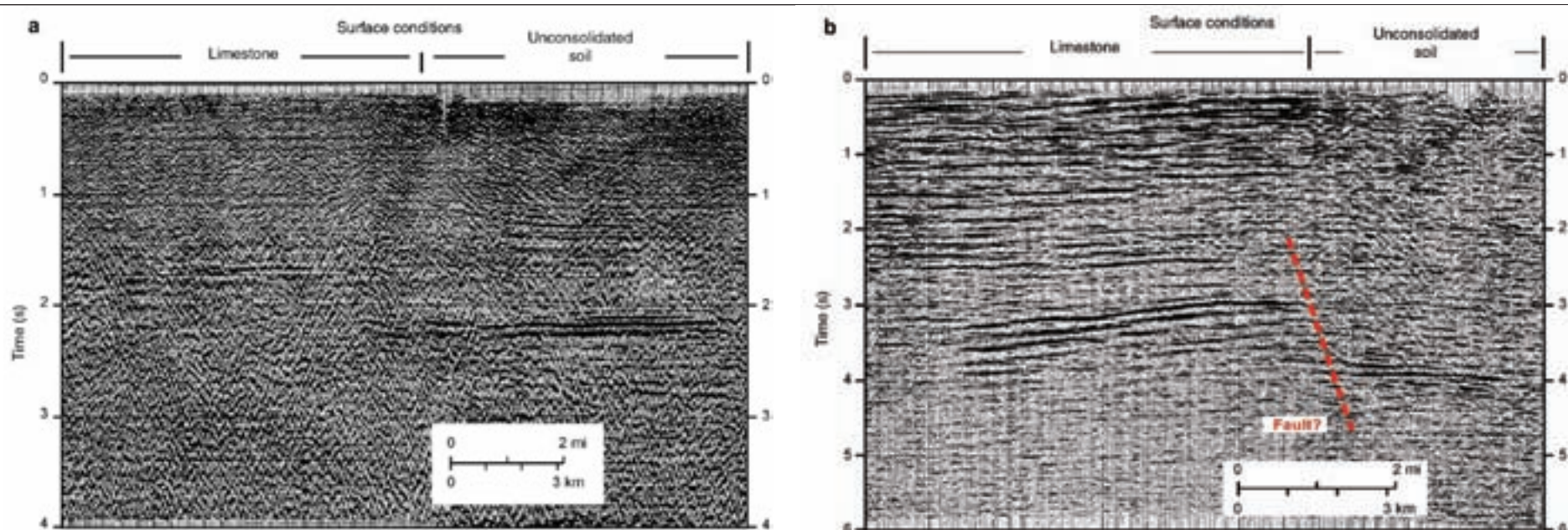


Figure 2 – Comparison of P-wave data (a) and SH data (b) acquired along a profile that traverses a low-velocity Earth surface on the right and a high-velocity surface on the left. The SH data image beneath the exposed carbonate; the P-wave data do not. From Fix and others (1986).

continued from previous page

variable time origins), it is difficult – and usually impossible – to remove from the data.

Upcoming reflections from deep targets do indeed arrive at the surface receivers as we suspected from last month's discussion, but these reflections are overwhelmed by the reverberating, unending ground-roll noise.

\* \* \*

How then can geology beneath a high-velocity outcrop be imaged?

The answer is a beautiful bit of wave

physics explained in one or two textbooks and which is summarized by the following equation that defines the frequency components of a propagating Love wave:

$$\omega_n = \frac{n \pi V_{S1}}{H} \left[ 1 - \left( \frac{V_{S1}}{V_{S2}} \right)^2 \right]^{1/2}$$

In this equation,  $\omega$  is the frequency (Hz) of the Love wave,  $H$  is the thickness of the high-velocity surface layer,  $V_{S1}$  is the S-wave velocity in the surface-exposed layer and  $V_{S2}$  is the S-wave velocity in the interval beneath the surface layer.

When  $V_{S1}$  is greater than  $V_{S2}$ , as it is when the surface layer is basalt or carbonate, the quantity inside the square-

root bracket is negative, which results in an imaginary frequency. Because no Love wave can have an imaginary frequency, the physical consequence is that no Love wave propagates in this type of velocity layering, and there can be no surface noise mode.

If we therefore use SH shear technology to image beneath high-velocity outcrops, we have no surface-wave noise, and we should be able to capture SH reflections from deep targets.

One test of this principle – work done years ago by researchers at Arco – is shown above (figure 2) to illustrate the physics.

The P-wave data are not too bad in the right half of the image space, where there is a slow-velocity earth surface, but the

data are unusable on the left, where the profile moves onto the fast-velocity surface.

In contrast, SH data acquired along the profile produce a valuable image beneath both the low-velocity surface and the high-velocity surface and imply that there is a faulted trap below the fast-velocity surface that could be a good drilling target.

Excessive Rayleigh ground roll destroyed the P-wave reflections along the high-velocity surface. The absence of a Love surface mode on the high-velocity surface allowed SH reflections to be seen.

Think about using SH seismic technology if you have a bothersome high-velocity surface that hinders the use of P-wave data across a prospect area. □



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## WASHINGTONwatch

## Energy Issues Action Still Pending

By DAVID CURTISS  
GEO-DC Director

Congress returns to work this month after its August recess – and if legislators feel a sense of *déjà vu*, it is because their agenda includes many issues left unresolved in June and July.

Chief among them is dealing with high energy prices.

There is no doubt that senators and representatives, while spending the past month at home with their constituents, heard much about the pain caused by high gasoline prices. Americans are demanding action, and lawmakers are dutifully responding with lots and lots of action. But they aren't making much progress.

During June and July hardly a week passed without some new piece of energy legislation tackling access issues, production tax credits, the role of speculators and so on. Each bill offered ideas – some new, some repackaged – to deal with the energy crisis.

Few sponsors of these bills expected them to be enacted – but introducing these ideas allowed them to be vetted, identifying strengths and weaknesses. That's good, because some of them may form the core of future legislation that receives serious consideration.

But this summer was not a time for serious consideration, and that time probably won't arrive for several more months. After all, this is an election year. The press conferences, votes held and others blocked, charges and counter-charges are all about political positioning ahead of the November election rather



EXPLORER Photo

GEO-DC Director David Curtiss chats during the conference for state legislators.

than accomplishing anything.

So what is an AAPG member who is a U.S. citizen to do?

Get engaged.

If ever there was a time to contact your legislator about energy issues, it is now. Visit their local offices or send them a letter.

Later this month, several AAPG members will be in Washington, D.C., for geoCVD (Congressional Visits Day) to meet with their lawmakers and staffs and begin that kind of dialog.

\* \* \*

Here at GEO-DC we are doing the same thing, both responding to inquiries and creating opportunities to present fact-based science and thereby inform the policy making process.

One such opportunity occurred on July 11, when AAPG leaders asked me to participate in an energy forum in the Senate. Six Republican senators attended the event, spending two full hours with the four panelists, asking questions on a

variety of topics. My topic was the exploration and development potential of the outer continental shelf.

Other panelists included:

✓ Marvin Odum, president of Shell Oil, discussing oil shale development.

✓ David Vieau, CEO of A123 Systems, talking about plug-in hybrid vehicles.

✓ Kevin Book, senior energy policy analyst with FBR & Co., covering energy markets.

We continue to look for such opportunities at the federal level. But it is important to remember that dealing with high energy prices is not just a federal issue, it is also hitting state governments very hard. So while the turmoil persisted in Washington, GEO-DC headed to New Orleans in late July for the National Conference of State Legislators (NCSL) 2008 Legislative Summit.

This annual event plays host to more than 8,000 people from across the nation and the world. The attendees included state legislators, senior legislative staff, federal and state agency personnel, as well as government affairs professionals from corporate and non-profit organizations.

More than 300 organizations exhibited at the meeting, representing a remarkable diversity of interests and topics.

For the second year in a row, AAPG's Division of Professional Affairs (DPA) had its own booth at NCSL. Rick Erickson, DPA president, Carl Smith, DPA Government Affairs Committee chair, Don Juckett, GEO-

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22 - 26	AVO and Seismic Attributes	London, England	5 day course
29 - 30	Basic Reservoir Engineering for Non-Engineers	Houston, Texas	2 day course

#### October, 2008

1 - 3	Sequence Stratigraphy of Clastic Rock & Reservoirs: Well Logs Cores / Outcrop and Seismic	Houston, Texas	3 day course
6	Chimneys for Seal and Charge Risk Assessment	Houston, Texas	1 day course
13 - 17	Geopressure: Prediction, Analysis and Risk Assessment for E & P	Houston, Texas	5 day course
20 - 24	Applied Subsurface Geological Mapping	Dallas, Texas	5 day course
27 - 31	Principles of 3-D Seismic Interpretation	Kuala Lumpur, Malaysia	5 day course

#### November, 2008

3 - 5	Basics of the Petroleum Industry	Houston, Texas	3 day course
5 - 7	Quality Control for Subsurface Maps (QLTs)	Houston, Texas	3 day course
10 - 14	Applied Subsurface Geological Mapping	Jakarta, Indonesia	5 day course

#### December, 2008

1 - 5	Modern Production Logging	Houston, Texas	5 day course
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DC's founding director, and I represented the Association and division at the event.

Many of the attendees wanted to talk about the high price of crude oil and its impact on their constituents back home. We, in turn:

- ✓ Expressed the Association's views as articulated in AAPG's statements.
- ✓ Provided information on the science and process of finding oil and natural gas.
- ✓ Talked about our role as a scientific and professional association.

In order to encourage attendees to provide us with their business cards – and thanks to Don Juckett's handiwork – we held a drawing for two mounted ammonite specimens. I am working with Carl Smith to follow-up with our booth visitors.

Incidentally, the winners of the drawing were Dale Stephens, member of the West Virginia House of Delegates, and Daniel A. Eaton, majority floor leader of the New Hampshire House of Representatives. Congratulations to both!

\* \* \*

Our attendance at NCSL was a good reminder that engaging policymakers on energy and environmental issues should not be restricted to the federal level. In fact, getting involved at the state level often can have immediate and significant impact.

As Rick Ericksen indicated in the July EXPLORER column, DPA is providing its members with a new tool to monitor state-level legislative activity. Meanwhile, at GEO-DC we continue to mainly focus on federal legislation, assisting at the state level as opportunities arise.

Unquestionably, lawmakers at all levels of government need the science-based facts and experience that AAPG and DPA members can uniquely provide. We also have the tools to do it properly. Now together we need to help federal, state and local lawmakers turn action into progress. □

## Internet TV

from page 46

television sites that provided the models for content, production and business used by some of the recent sites. ENL was owned by the Williams Companies and was primarily targeted to energy commodities traders. The site folded when the Williams Companies ran into financial difficulties following the Enron collapse.

Chesapeake officials say they do not intend to interfere with the sites' content.

At CleanSkies.tv, content providers include The Sierra Club, MIT Energy Initiative, Honda USA and Clean Energy Fuels Corporation.

David Willett of the Sierra Club said he is "encouraged by the fact that they don't care at all what we say – and they know we have no intention of pulling any punches and appear to be fine with that."

Recent CleanSkies.tv interviews include DPA President Rick Ericksen and GEO-DC adviser Don Juckett at the National Conference of State Legislators held in July in New Orleans.

Other interviewees have included various energy-focused authors, lawmakers, T. Boone Pickens, former congressman Newt Gingrich – and Fritz.

"If our news isn't balanced, no one will watch," said CleanSkies.tv anchor McGinnis. "Everyone here realizes that." □

# Funding for Research Urged

By DAVID CURTISS  
GEO-DC Director

Calling for "a robust federal oil and natural gas program – on the scale of oil, nuclear and alternatives, on the order of \$500 million per year," AAPG President Scott Tinker urged U.S. Senate appropriators to significantly boost oil and gas research.

In a letter sent to Sen. Byron Dorgan (D-N.D.) and Sen. Pete Domenici (R-N.M.), the chairman and ranking member, respectively, of the Senate Energy and Water Appropriations subcommittee, Tinker warned that "today's energy debate is often framed as a choice between fossil fuels or alternative (non-fossil) fuels, or between

fossil fuels and the environment, but these are red herrings."

As U.S. policy makers look for answers to the nation's energy challenge they must recognize that the development and expansion of alternative and new fuels will take at least 25-40 years, Tinker said. Meanwhile, fossil energy, which currently supplies 87 percent of total energy needs, provides the foundation upon which "we bridge to an alternative energy future."

But while oil and natural gas make up 65 percent of the U.S. energy portfolio, the federal oil and natural gas research program is miniscule in comparison. This lack of investment jeopardizes the stable

supply of fossil energies necessary to sustaining the U.S. and global economy and thereby enabling the development of new energy sources.

Rather than looking for "quick fixes and technological silver bullets," Tinker envisages a partnership between government, academia and industry that works to rebuild and expand the nation's oil and natural gas R&D capacity.

"As we contemplate tomorrow's energy sources, fossil fuels remain a foundation upon which to build a bridge to our energy future," he concluded. "It's a good place to start."

A copy of the letter can be found on the GEO-DC Web site at [www.aapg.org/geoDC](http://www.aapg.org/geoDC). □



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**Organized by** Earth Science Society of Libya (ESSL)

**In Cooperation with**

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• Sunday 16<sup>th</sup> and Monday 17<sup>th</sup> Nov. 2008

**Pre-Conference Courses**

- 1- Seismic Geomorphology
- 2- a. AVO for Fluid & Lithology Prediction.  
b. Fundamentals of Spectral Decomposition and Spectral Inversion.
- 3- Course & Workshop on the Petroleum Systems with Examples from Libya.
- 4- Fundamentals of Bio- and Chronostratigraphy Analysis in Exploration and Production Geology.

• Tuesday 18<sup>th</sup> - Thursday 20<sup>th</sup> Nov. 2008

**Oral and Poster Presentations**

• Friday 21<sup>st</sup> – Tuesday 25<sup>th</sup> Nov. 2008

**Post-Conference Field Excursions**

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☎ 00218 91 315 3488

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E-mail: [southlibya@lycos.com](mailto:southlibya@lycos.com)  
[southlibya@gmail.com](mailto:southlibya@gmail.com)

**Exhibition Contact** ☎ 00218 21 712 0135

Exhibition Information website: [www.gsl.org.ly](http://www.gsl.org.ly)

Exhibition Registration Form can be sent to: [regs@alalama.com](mailto:regs@alalama.com)

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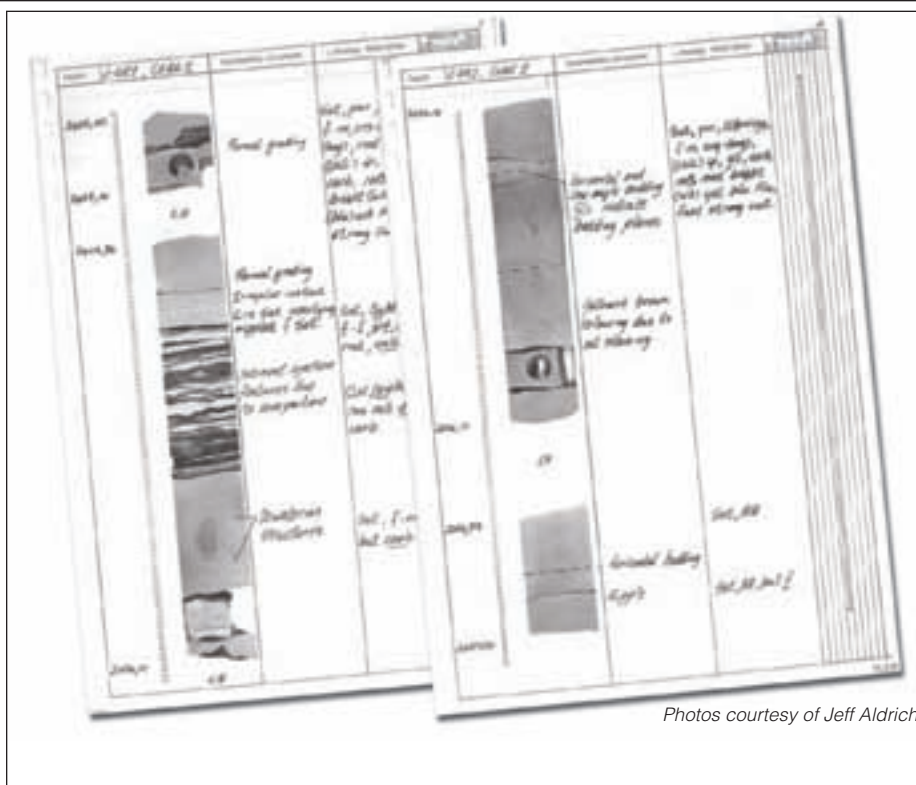
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**Alalama  
Events**



# Deep Channel Cores Featured In Cape Town

## 'Unique' deposits on display

By BARRY FRIEDMAN  
*EXPLORER Correspondent*

It is one of the largest core workshops ever offered that will focus on a single depositional environment.

"If not *the* largest," clarifies Jeff Aldrich, general vice chair of the AAPG International Conference and Exhibition (ICE) in Cape Town, South Africa, and one of the organizers of its much-anticipated Africa deepwater core poster session.

This year's ICE will be held Oct. 26-29 at the Cape Town International Convention Centre – AAPG's first such event in South Africa.

The workshop's size, however, isn't the only reason for the advanced buzz.

What's exciting, what's potentially so rewarding for explorers about the last Monday, Tuesday and Wednesday in

October, is that each of the displays to be featured combine core and logs (and most seismic as well) of confined channel flow deposit systems that have all yielded commercial hydrocarbon fields.

The cores come from four different countries – South Africa, Angola, Gabon and Nigeria – representing a range of facies and depositional styles all attributed to turbidites, specifically a complete source-to-sink-cored cross section of the “14A sequence” from the Orange Basin of South Africa and Angola blocks 15 and 17.

## Getting Organized

Aldrich, who is chief geologist at PetroSA (South Africa's state oil company), said cores from the west African giant oil and gas fields won't be the only ones

featured. His company also has made it possible for a single third order sequence, traced for over 200 kilometers across the basin from the shelf to the deep basin plain with an integrated core, log and seismic display, to be featured.

But since this is Africa, nothing, it seems, is easy, including the organizing and planning of such a conference.

"It took some persuasion," Aldrich said, "but this really seemed like the right idea at the right time with the current focus of industry activity on deepwater fields and the major theme of the conference on deepwater reservoirs."

“With the enthusiasm of

See **Core Workshop**,  
page 54



EXPLORER graphic



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## Cape Town Program Ready

Those planning to attend this year's AAPG International Conference and Exhibition in Cape Town, South Africa, have one more chance to save money by registering early.

Register online by Sept. 30 and you can save as much as \$175 off the registration fee – and you'll also beat the rush for flights and accommodations.

The conference will be held Oct. 26-29, designed around the theme "African Energy – Global Impact."

Information about the entire technical program is available online – including the 15 short courses, which offer a variety of sessions dealing with cutting edge technology and science.

Those courses include:

- ✓ Interpretation of 3-D Data.
- ✓ Deepwater Salt Tectonics.

✓ Deepwater Turbidites: A Major Oil and Gas Reservoir.

✓ Geochemical Exploration for Oil and Gas: Strategies for Success.

✓ Evaluating Reservoirs and Seals.

✓ Seismic Pressure Prediction in Practice.

✓ African Geodynamics.

✓ Sequence Stratigraphy for Graduate Students.

The technical program also includes field trips and 70-plus sessions that are built around "the big five" symbols of Africa's animal kingdom.

The Cape Town program also offers:

✓ A plenary session dealing with African energy.

✓ Four special forums dealing with the Lusi mud volcano; global climate change (from an African perspective);

the role of small and independent companies in Africa's future; and the geosciences work force of the future.

✓ An African deepwater core poster session (see related story).

✓ A featured speaker luncheon offering the talk "The Four-Billion-Year Existence of Life – Africa's Role in Understanding This Remarkable Story," given by Bruce Rubidge, director of the Bernard Price Institute for Paleontological Research at the University of Witwatersrand.

✓ The AAPG Distinguished Lecturer Luncheon, featuring Lynn N. Hughes, this year's AAPG distinguished lecturer of ethics, speaking on "Dilemmas in Trust."

Complete information – and links to early registration – can be found online at [www.aapg.org/capetown/](http://www.aapg.org/capetown/). □

## Core Workshop

from page 52

geologists to share their experience and work in the deepwater turbidite plays it wasn't that difficult to get participants in the core workshop," he added.

The organizers' first step was to find participants who could get partner approvals to display the core, as some of the samples were proprietary and had never been seen before; then, the core needed to be cut and packaged for shipping and display.

Special care was needed to ship and present the displays – a total of 454 meters of core samples will be displayed, requiring an area of 800 square meters to show it.

Organizers Answa DeLange and John Snedden say the workshop is unique because few scientists have actually seen these particular samples.

"Every delegate will get to see the displays laid out for the entire conference and meet the world's top experts in turbidite and confined channel deposits and discuss the details while looking at the cores in person," Snedden said.

Snedden was instrumental in securing cores from Total, Chevron and ExxonMobil.

### 'A Geologic Feast'

Cores on display will include a full spectrum of these turbidite and debrite lithofacies deposited in the confined-channel complexes of African paleo-deepwater basins – from multiple operators and basins.

"The idea," Aldrich said, "began with PetroSA wanting to use the cores available in the Bredasdorp Basin to characterize a complete basin-wide sequence and put it on display."

It was then that Snedden heard of the idea and made inquiries to other companies to see if they would release cores to the workshop.

They did.

"The core material highlights several hierarchical scales of erosion and deposition that influence sandstone amalgamation and the preservation of intervening shale-prone units," Snedden said, "thus impacting reservoir connectivity and oil field performance."

The following specific areas will be featured, discussed and reviewed:

✓ A complete "Source-to-Sink" cored cross-section of the 14A sequence from the Orange Basin of South Africa. This sequence was featured in Frank Brown's pioneering AAPG Studies in Geology No. 41, "Sequence Stratigraphy in Offshore South African Basins" (1995).

✓ Cores from Angola blocks 15 and 17, a world-class deepwater producing province with multiple billion-barrel oil fields.

✓ Cores covering a full spectrum of turbidite and debrite lithofacies deposited in confined-channel to distributive systems in African paleo-deepwater basins.

Snedden believes that seismic prediction of reservoir continuity and pre-drill net-to-gross estimates in African slope channel systems are greatly enhanced when calibrated with conventional core – and believes the findings will be a geologic feast and a potential bonanza.

"The main way these relate is that they are all deposited in confined channel systems, some as turbidites, some as debris flows, mass wasting; some progradational and some retrogradational.

"They are all from or related to commercial hydrocarbon fields," he added, "so they are very practical and useful to understand both from an exploration and production viewpoint." □

Register Now! • [www.aapg.org/capetown](http://www.aapg.org/capetown)

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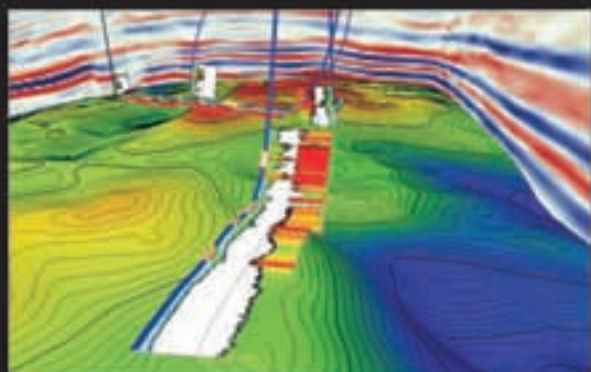






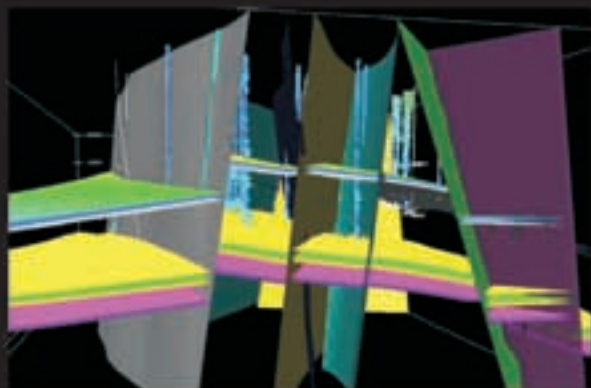
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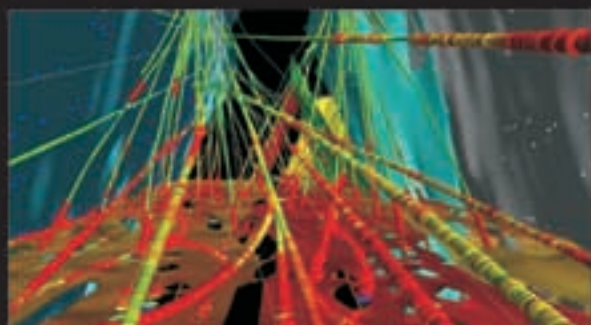
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## Call for Papers & Posters

**2009 AAPG MID-CONTINENT SECTION MEETING  
MARRIOTT SOUTHERN HILLS**

**OCTOBER 11-13, 2009**

[www.2009aapgmidcon.com](http://www.2009aapgmidcon.com)

Now in the 21<sup>st</sup> Century we and our future generations must develop all and every available energy resource at our disposal. The AAPG is welcoming an entirely new generation of geoscientists into our ranks and it is our responsibility as a professional organization to provide the intellectual resources to these new hires (and old hands alike) so that they can develop the new energy resources for generations yet to come.

Abstracts may be submitted for either oral or poster presentations on any of the following topics, in keeping with the Meeting's theme, "Resources for the Generations":

### **The Woodford Formation.**

**Applications for 3-D Seismic: Structure Stratigraphy & Fracture ID.**

**Reservoir Stimulation: Design, Costs & Results.**

**Horizontal Plays in the Mid-Continent: Geologic Opportunities, Drilling & Completion Techniques.**

**Fractures & Micro-fractures: Importance to Resource Plays.**

**Professional Development for Geoscientists: New Hires to Old Hands, Concepts to Completions.**

**New Oil & Gas Ventures: Buy, Drill & Sell**

**Mid-Continent Petroleum Systems.**

**Unconventional Technology in Mature Fields.**

**Shale & Coalbed Reservoirs in the Mid-Continent.**

Submit Oral Session Abstracts to John Mitchell: [mtgeologist@yahoo.com](mailto:mtgeologist@yahoo.com)

Submit Poster Presentation Abstract to Jesse Gillman:  
[jgillman@stmaryland.com](mailto:jgillman@stmaryland.com)

**Deadline** for abstract submittal is **February 1, 2009.**

Abstracts are limited to 250 words.

Presented by the Tulsa Geological Society



## REGIONS&sections

# Imperial Barrel Program On a Roll

(Editor's note: Regions and Sections is a regular column in the EXPLORER offering news for and about AAPG's six international Regions and six domestic Sections. Contact: Carol McGowen, AAPG's Regions and Sections manager, at 1-918-560-9403; or e-mail to [cmcgowen@aapg.org](mailto:cmcgowen@aapg.org).)

By CONNIE MONGOLD  
IBA Committee Chair

As we enter the third season of global Imperial Barrel Award competitions, I first would like to thank the Imperial Barrel Award Committee members and local IBA competition coordinators, AAPG's amazing staff, committed industry sponsors and judges, supportive academic advisers and directors and last – but certainly not least – the participating students who made the 2008 Imperial Barrel Award program so successful and enjoyable!

I hear many others involved with the program echo my sentiments of appreciation:

- ✓ Sponsoring companies tell us they were so impressed with the caliber of students they met through the local and final competitions that they want to incorporate the IBA into their recruiting programs.

- ✓ Recruiters discovered new schools with great programs – because by participating in the IBA, schools showcased some of their best student talent.

- ✓ Schools are gaining recognition, and the opportunity to learn using real industry datasets is attracting new students.

- ✓ Students are getting excited about geology and the energy industry because they can "taste and feel" the experience of hunting hydrocarbons in a supportive educational framework.

Our goal for the Imperial Barrel Award program is this: Enhance AAPG's reputation and connect industry with academia by running a world class educational program involving students and professionals.

Students, former participants, members of academia and other industry professionals are eager to become part of the Imperial Barrel Award program, because IBA is good for AAPG, good for industry participants, good for geoscience academia and good for geoscience students.

When you find a win-win-win-win opportunity, the best thing to do is "get on board."

### **Start Work Now!**

Now is the time for Regions and Sections to select their IBA coordinator for 2009.

Last year many Region or Section presidents served to organize the local IBA competition, often working as a one-person committee. This year, Regions and Sections are encouraged to build on the lessons learned from the 2008 competition – including the lesson to share the work and the fun with a larger committee.

IBA committees also may include former students. For example, the AAPG IBA Program Committee includes former 2007 IBA participant Helen Cromie, a graduate of Imperial College London.

### **University Team Requirements**

With the beginning of the 2008-09 academic year, universities can get a head start on the competition by identifying their IBA faculty sponsor, who serves as team coach, and selecting a team of five students.



Local AAPG members may also be called upon to help coach an IBA team.

Teams must comprise geoscience graduate students and may include one geophysics student.

Effective January 1 of the IBA competition year, two team members may be in their third academic year of graduate training, while the other team members must be in their first or second year of graduate training.

Participants must be full-time students with no more than six months of industry internship experience or no more than six months of full-time employment as a professional geoscientist.

Students who have worked as geologic

Here's the timeline for the 2009 IBA competition:

- ✓ Interest forms due by Friday, Nov. 21.

- ✓ Teams confirmed by Region/Section coordinators by Dec. 5.

- ✓ IBA datasets distributed first week of January.

- ✓ Section/Region qualifying competitions: Feb. 15-March 15.

- ✓ Section/Region IBA coordinators notify AAPG HQ of first place team no later than March 16.

- ✓ Global IBA finals competition: Friday and Saturday, June 5-6, in Denver (preceding the AAPG Annual Convention and Exhibition there June 7-10).

- ✓ IBA Awards Ceremony at Student Reception: Monday, June 8, Denver. □

technicians, data analysts, etc., will not have that work experience count toward the allowed six-month parameter.

To prevent overloading students' schedules, the IBA learning experience is best when incorporated into an existing academic course or used as an end-of-term capstone project.

### **Get Involved**

Want to be involved?

Contact AAPG headquarters if you are interested in:

- ✓ Sponsoring the competition at the 2009 AAPG Annual Convention and/or at the local Region/Section level.

- ✓ Entering a student team in the competition.

- ✓ Volunteering to help with committee activities.

Interested universities are invited to go to [www.aapg.org/iba](http://www.aapg.org/iba) to view video clips of the 2008 competition. Click on "Request to Participate" and submit an interest form. Or contact Mike Mlynec, assistant manager membership, student focus, at [mikem@aapg.org](mailto:mikem@aapg.org)

Watch for more IBA 2009 competition details in future editions of the EXPLORER. □



## Denver Call for Papers Opens

The Web site is open and the call for papers period continues for the next AAPG Annual Convention and Exhibition, which will be held June 7-10 in Denver.

This year's theme is "Image the Past – Imagine the Future."

While several sessions will take advantage of the industry's current intensive emphasis on the Rocky Mountain region, many other sessions in Denver will be technical, more general and often international in scope.

Organizers are seeking papers that fit into 15 general topics:

- ✓ Global Deepwater E&P (four proposed sessions).
- ✓ Deepwater Reservoir Systems (eight sessions).
- ✓ Siliciclastic Systems (seven sessions plus an SEPM research symposium).
- ✓ Carbonate Systems (ten systems).
- ✓ Resource Development and Reservoir Characterization (nine sessions).



- ✓ Structural Geology (14 sessions).
- ✓ Exploration and New Plays (11 sessions).
- ✓ Tight Gas (five sessions).
- ✓ Unconventional Reservoirs (six sessions).
- ✓ Astrogeology (three sessions).
- ✓ Alternative and Renewable Energy (three sessions).
- ✓ Petroleum Geology and Public Policy (three sessions).
- ✓ Responsible Development, Sustainability, Climate Science (nine sessions, including a global climate change forum).
- ✓ Geologic Interpretation Case Histories of Geophysical Data (12 sessions).
- ✓ Student Sessions (two sessions – AAPG and SEPM).

The call for papers will end Nov. 4.

For more information on the technical program and the meeting in general go online to [www.aapg.org/denver](http://www.aapg.org/denver). □

# Geoscientists Needed

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**Retention survey open through September****Flexibility Important to Employees**

Editor's note: AAPG's Workforce Retention Survey targets degreed, women geoscientists of all ages and at every stage of their careers who have had industry work experience at one time or another.

To participate, go to the AAPG Web site at [www.aapg.org](http://www.aapg.org), and click on "AAPG Workforce Retention Survey."

The survey closes on Sept. 30.

By CAROL MCGOWEN

*Regions and Sections Manager*

Last month's Regions and Sections EXPLORER column featured AAPG's new Workforce Retention Survey, generated through the Professional Women in Earth Science Committee as a means to gather data and identify issues impacting the retention of women geoscientists in the energy industry work force.

Ultimately, the survey's desired outcome is to inform AAPG's role and future actions toward improving the workplace climate for women geoscientists.

At deadline for this article, over 1,600 women geoscientists had completed the survey. The survey will remain open through Sept. 30.

Survey data will be kept confidential, but the consolidated results will be widely distributed to energy industry leaders and could help reshape energy industry employment.

The survey was generated specifically for the energy sector to address a growing work force problem. Certainly, women geoscientists outside of the energy industry face similar



Preece



Gerdes

challenging situations, but this survey is very precise in its intent to focus on retaining women in the energy industry work force.

#### **Chevron's Family Friendly Employment Practices**

Parallel to the workforce survey, the August Regions and Sections column began to feature companies whose employment policies and workplace environment can be described as "family friendly," supporting not only women geoscientists, but also their partners in dual-career households.

Last month's article featured BP Exploration.

This month we feature Chevron with examples of family-friendly employment practices from two of their business units – one U.S., the other international.

Chevron supports women geoscientists through its flexible, extended leave policy for women before and after childbirth and even through the design of its office facilities.

"Mothers rooms" are available at

**In a less flexible work environment I would have left the work force, at least temporarily, while my children are young, as they truly are my priority.**

every Chevron site – the company's flexible employment practices have proved advantageous by enabling Chevron to retain skilled employees so vital to maintaining their competitive position in the industry.

✓ Rachel Preece is a technical team lead with Chevron International Exploration and Production Company in its Southern Africa Business Unit.

British by birth, Rachel was hired by Chevron in 1999 in the London, England office. After several years of traveling widely for Chevron she eventually chose to relocate to Chevron's Houston facility from California. In 2007, her immediate management worked with her to define a telecommuting project plan that allowed Rachel to return to work quickly after the birth of her son.

"This attention to individual needs and project management flexibility benefited both myself (valuable time with my infant) and my employer (maintaining access to

key skill sets)," she said. "I have subsequently returned to my office with no interruption to my career."

✓ Martha Gerdes, leader of the seal and trap team for Chevron Energy Technology, is the mother of twins and a singleton, and is an AAPG member. She has worked part-time (2/3 time, 27 hours per week) since her twins were born five years ago.

"I took a six-month family leave then (two months on bed rest and four months after their birth)," she said. "My third child was born two years ago and I took an almost eight-month family leave. In these last five years while part-time and intermittently on family leave, I have continued to be provided with strong career opportunities, including two promotions, strong salary actions and a move to team supervisor.

"More importantly to me personally, the company has continued to be very flexible with my work hours, allowing me to alter my basic work schedule over time as my children's school and childcare needs have changed," she said. "Additionally, the company is supportive of my sometimes-weekly needs for flexibility to accommodate childcare issues, take sick children to the doctor, attend parent-teacher conferences, etc.

"In a less flexible work environment I would have left the work force, at least temporarily, while my children are young, as they truly are my priority," she said. "Chevron has given me no excuse to do so, so here I am still, no complaints!" □

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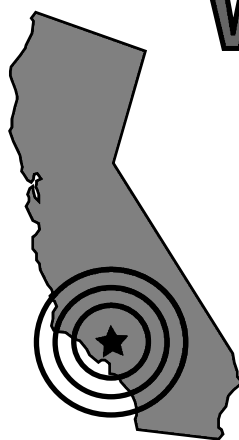
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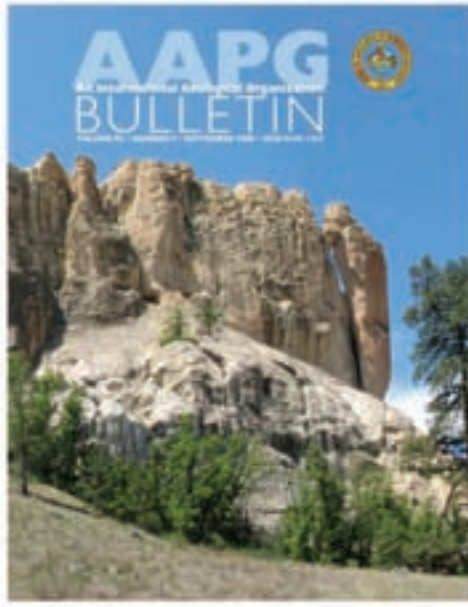


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The September 2008 cover of the AAPG Bulletin

# More science than you can shake a pick at.



## Connectivity of fluvial point-bar deposits: An example from the Miocene Huesca fluvial fan, Ebro Basin, Spain

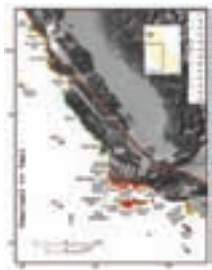
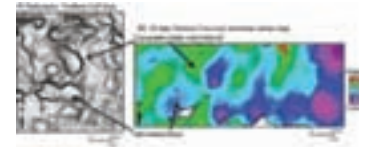
Marinus E. Donselaar and Irina Overeem

The Miocene Huesca fluvial fan within the Ebro Basin, Spain, consists of point-bar deposits connected by elongate channel floor sand ribbons. A conceptual model takes into account this connectivity with important implications for reservoir volume, recovery factors, and sweep efficiency.

## Paleocene to Eocene deep-water slope canyons, western Gulf of Mexico: Further insights for provenance of deep-water offshore Wilcox Group plays

Angela McDonnell, Robert G. Loucks, and William E. Galloway

The Tertiary Wilcox Group contains a deep-water fan system that is a significant exploration target offshore Texas. Seismic imaging reveals that deeply buried submarine canyons likely connected the basinal turbidites to equivalent-aged onshore deposits.



## Families of Miocene Monterey crude oil, seep, and tarball samples, coastal California

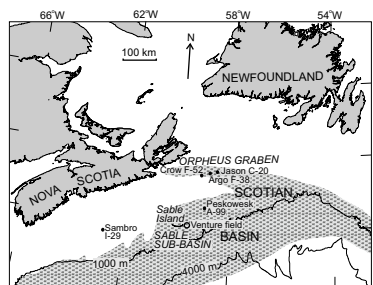
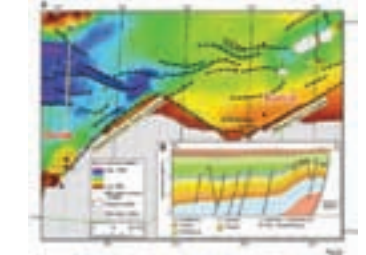
Kenneth E. Peters, Frances D. Hostettler, Thomas D. Lorenson, and Robert J. Rosenbauer

Geochemical data were used to better understand the origin and distribution of crude oil samples from wells, seeps, and floating or beached tarballs from coastal California. A classification decision tree was constructed, and samples collected subsequent to storm activity indicate a seep origin, rather than anthropogenic source.

## Geochemically driven exploration models in uplifted areas: examples from the Norwegian Barents Sea

S. E. Ohm, D. A. Karlsen, and T. J. F. Austin

The Norwegian Barents Sea region is traditionally believed to be only gas prone, though most of the world's petroleum provinces reside in similarly uplifted settings. Recent discoveries indicate otherwise; geochemical evidence supports the existence of overlooked petroleum potential in this area.



## Early diagenesis of inner shelf phosphorite and iron-silicate minerals, Lower Cretaceous of Orpheus graben, southeastern Canada: Implications for the origin of chlorite rims

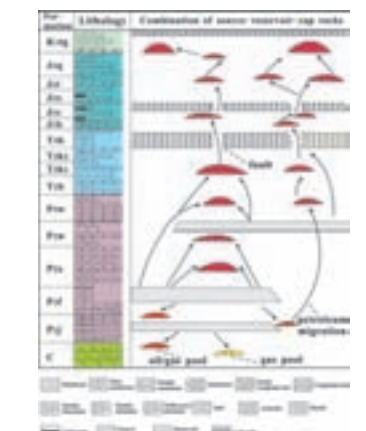
Georgia Pe-Piper and Shawna Weir-Murphy

Fe-rich chlorite rims on framework grains have inhibited quartz cementation and improved reservoir quality in the Scotian Basin, offshore eastern Canada. The elevated abundance of phosphorus minerals is associated with such rims and may be an indicator of conditions suitable to their formation.

## Episodic petroleum fluid migration in fault zones of the northwestern Junggar Basin (northwest China): evidence from hydrocarbon-bearing zoned calcite cement

Zhijun Jin, Jian Cao, Wenxuan Hu, Yijie Zhang, Suping Yao, Xulong Wang, Yueqian Zhang, Yong Tang, and Xipu Shi

Zoned calcite cements within the Junggar Basin, China, alternate between hydrocarbon bearing and hydrocarbon free on a micrometer scale. This indicates episodic mixing of basinal fluid with meteoric water due to seismically induced pumping of petroleum-bearing fluid during fault movement.


Members may access the AAPG Bulletin online at [http://www.aapg.org/September\\_Bulletin/](http://www.aapg.org/September_Bulletin/)

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.



## AAPG Candidate Bios, Information Now Online

Biographies and individual information for AAPG officer candidates for the 2009-10 term is available online at [www.aapg.org](http://www.aapg.org).

The information also will be inserted in an upcoming EXPLORER.

The president-elect winner will serve as AAPG president in 2010-11. The terms for both vice president-Regions and secretary are two years.

Ballots will be mailed in spring 2009.

The slate is:

### President-Elect

☐ Donald D. Clarke, geological

consultant, Lakewood, Calif.

☐ David G. Rensink, Apache Corp., Houston.

### Vice President-Regions

☐ Adekunle A. Adesida, Shell Petroleum Development, Nigeria.

☐ Alfredo E. Guzman, consultant, Veracruz, Mexico.

### Secretary

☐ William S. Houston, Samson, Denver.

☐ Peter MacKenzie, MacKenzie Land & Exploration, Worthington, Ohio. ☐

## Students, Chapters Awards Announced

Student Chapter awards and awards for student technical presentations given at the AAPG Annual Convention and Exhibition in San Antonio have been announced by the Convention Organizing and Student Chapters committees.

### Shell Best Oral Presentations

✓ First place – Joannah M. Metz, California Institute of Technology, for "Sulfate-Rich Eolian and Wet Interdune Deposits, Erebus Crater, Meridiani Planum, Mars."

✓ Second place – Andrew L. Petter, University of Texas at Austin, for "Small

Lowstand Deltas as a Consequence of Sustained Alluvia Aggradation During Relative Sea-Level Fall."

✓ Third place – Enzo S. Aconcha, University of Texas at Austin, for "Integrating Core, Well Logs and Seismic Interpretation to Improve Understanding of Albian Patch Reefs, Maverick Basin, SW Texas."

### Shell Best Poster Presentations

✓ First place – David Contreras, University of Texas at Austin, for "Structural and Stratigraphic Correlations Across the Burro Negro Fault Zone, Northeastern Margin of the Maracaibo Supergiant Basin."

✓ Second place – Brandi Harkins, University of Nebraska, for "Toward a More Refined Lower Miocene Calcareous Nannofossil Biostratigraphy in the Gulf of Mexico."

✓ Third place – Zishann Khan, University of Ottawa, for "Levee Asymmetry in a Deep-Water Channel Bend: Example from the Isaac Formation (Windermere Supergroup), Southern Canadian Cordillera."

### Schlumberger Outstanding Student Chapter Winners

✓ International – Padjadjaran University, Indonesia.

✓ United States – University of Utah.

### Jim Hartman

#### Service to Students Award

✓ Robert T. "Bob" Clarke.

The Hartman Award is presented in recognition of long-term support of AAPG student members and significant contributions to the education and professional development of young geoscientists.

AAPG's Student Chapters program also received sponsor support for specific events during the annual convention in San Antonio, including:

✓ AAPG/SEPM student reception – ExxonMobil.

✓ Student lounge – Chevron.

✓ Student Chapter field trip and short course – EBY Petrography & Consulting, EnCana Oil & Gas and Pioneer Natural Resources.

✓ Student volunteers – Noble Energy.

✓ Participation in field trips and short courses – Newfield Exploration.

✓ Datapages free download cards – Devon Energy, Hess

✓ Student membership fees – Chevron. ☐

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\* National Cancer Institute, Cancer Trends Progress Report—2005 Update. 5-year survival rates improved for all sites (of cancer) combined.



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## WWWupdate

## PetroleumGeology.org Launched

By JAMIE EDFORD  
Web Site Assistant

The AAPG Web site family has grown again with the addition of PetroleumGeology.org, a one-stop source for information about petroleum exploration and production geared toward the general public.

PetroleumGeology.org is a Web site produced by the AAPG Public Outreach Committee (POC) chaired by Eric Radjef, and is focused on the role of the science of geology, specifically petroleum geology, in society and the oil and gas industry.



The site aims to show a different side of the industry – one that doesn't get the same type of attention as new offshore rigs or gas prices – but with the answers to questions about those topics, and so much more.

Radjef credited POC member Rachel Paez with leading the project.

The Internet is home to a vast wealth of knowledge concerning the petroleum industry and the many facets of geology. However, finding that information – and, more importantly, presenting it in a way that is understandable and meaningful to those who are not involved in the industry – can be a challenge.

Anyone with a career in the petroleum industry has been asked at some point by a curious relative, neighbor or acquaintance, "So what exactly do you do?"

"How do you get the oil from the ground?"

"Why is oil so expensive?"

With the increased focus on the rising cost of energy and the debate over expanding drilling operations in the United States it's natural for average Americans to want to know the facts about petroleum exploration and production so they can make their own informed decisions.

But what if a person doesn't have access to an AAPG member to answer their questions?

Now, they do.

PetroleumGeology.org's information is presented in a concise yet conversational tone, without "talking down" to the viewer. Each topic page is illustrated with a geology or industry-related high-resolution photograph and is supplemented with a list of links to additional information and other relevant sites chosen by the POC.

No other Web site on the Internet has this breadth of information gathered in one place, with such context and guidance – and in a language that is neither too technical nor too childish.

PetroleumGeology.org strives to reach an underserved segment of the population that more than ever wants to be informed about the petroleum industry and the entire exploration and production process.

Who better to do this than geoscientists, with their passion and knowledge?

"When we started the PetroleumGeology.org project, there wasn't even one good place on the web to get basic information on petroleum geology; so that's where we decided to start," Radjef said. And the next time you're asked one of those persistent questions, you'll be ready – PetroleumGeology.org is a pretty good answer.

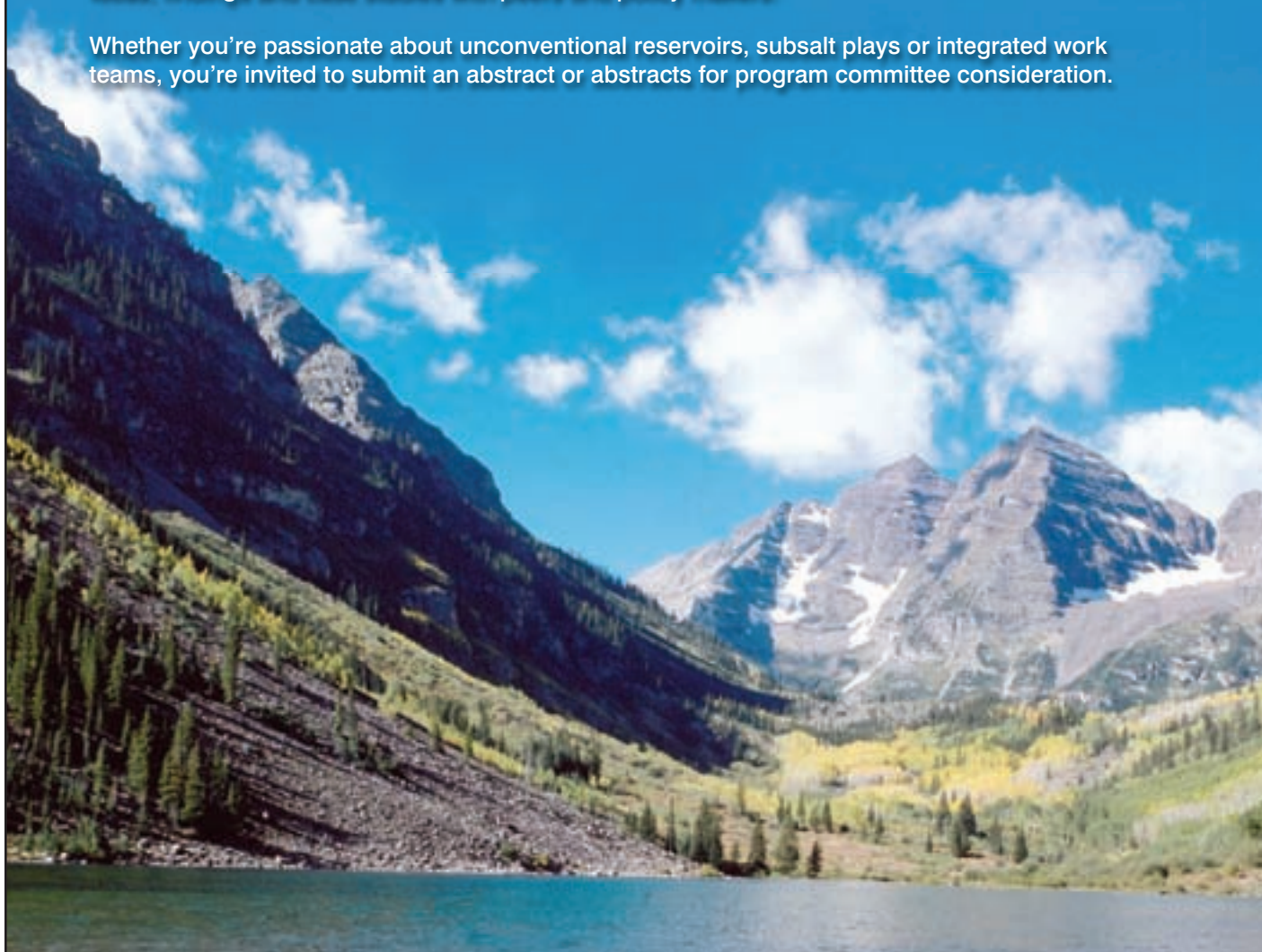
Visit PetroleumGeology.org today, and see what AAPG is doing to educate, empower and connect with the public. And, send the link to a friend. □

## Call for Abstracts

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The Rockies are red hot and the AAPG Annual Convention and Exhibition (ACE), 7-10 June 2009 in Denver presents new opportunities for geosciences professionals to present and hear about the latest issues affecting exploration success. Cutting-edge geological and petroleum research is the cornerstone of ACE, offering E&P researchers and practitioners a platform to share important ideas, findings and case studies with peers and policy makers.

Whether you're passionate about unconventional reservoirs, subsalt plays or integrated work teams, you're invited to submit an abstract or abstracts for program committee consideration.



Abstract submittal site is open. Go to  
[www.aapg.org/denver](http://www.aapg.org/denver). Are you in?



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## FOUNDATIONupdate

## Bookout Provides Additional Funding

John Bookout has provided additional funding to the AAPG Foundation's K-12 Program – a program that bears his name and owes much to his commitment toward educational excellence in geology.

Bookout's gift is in support of what is officially called the "Bookout Initiative," named after his kick-off gift to the program in October 2007 – an initiative that has provided funding to train over 350 teachers in geology through the Ellison Miles Geotechnology Institute at Brookhaven College in Dallas.

Teachers who recently participated in



Bookout

and then evaluated the program praised it as being a "tremendous experience (with) great presenters;" "It was amazing;" and "It was wonderful to see in the field what we read and study in the classroom. Thank you!"

The Bookout Initiative started after

Foundation Executive Director Rick Fritz pointed out to the Foundation Trustees that financial support of K-12 activities had been "relatively modest" in past years, despite talk and agreement that such an emphasis held high value to the profession.

Bookout stepped forward to launch the funding. Since then he also funded a special field trip, "Geology on the Bus," in January that received rave reviews from all 35 teacher participants.

The Foundation mission continues to expand through support of programs such as the K-12 "Bookout Initiative."

For further information on this or other Foundation programs contact Rebecca Griffin, Foundation administrative manager, at [rgriffin@aapg.org](mailto:rgriffin@aapg.org), or call 1-918-560-2644.

\* \* \*

In other AAPG Foundation news, the Foundation Board of Trustees recently approved \$47,500 in grants for the following proposals:

✓ \$10,000 to Trinity University for K-8 Teacher Science Curriculum Program at Stone Oak Park.

✓ \$2,500 sponsorship of the Student/Teacher Program at AAPG's International Meeting in Cape Town.

✓ \$35,000 to AGI for the "No Child Left Inside" 2008 Earth Science Week Program.

Also, the Foundation currently is seeking Letters of Inquiry for the 2008-09 Fiscal Year. Full details regarding Foundation priorities and grant procedure submission guidelines are available to download at [http://foundation.aapg.org/documents/GrantProcedureGuidelines\\_000.pdf](http://foundation.aapg.org/documents/GrantProcedureGuidelines_000.pdf).

The deadline to receive LOIs is Oct. 1. For further details contact Rebecca Griffin. □



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To these people, and to those who have generously made donations in the past, we sincerely thank you.

With your gifts, the AAPG Foundation will continue its stewardship for the betterment of the science and the profession of petroleum geology.

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*In memory of Robert Dill*  
Nigel Edwin A. Johnson  
Yousif K. Kharaka

Thomas Stanzel Laudon  
*In memory of Lowell R. Laudon and Richard B. Laudon*  
Morris W. Leighton  
Loveness Mpanje  
Jean-Marie Mudry  
Kim Thomas Nordstog  
Richard Evan Paige

**Dean A. McGee**  
**Distinguished Lecture Fund**  
Christopher Howard Bradley

**Grants-In-Aid Fund**  
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Mark P. Cloos  
Edward G. Dobrick  
*In memory of Jean G. Funkhouser*  
David Eugene Eby  
Jean K. Funkhouser  
John Edward Gilcrease  
Robert Nathan Ginsburg  
Jay Mason Gregg  
John Reed Maxwell  
Richard Fastabend Meyer  
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Haydn Herbert Murray  
Richard Edward Oppel  
Richard Evan Paige  
Joseph Roy Whiteside

**Gustavus E. Archie**  
**Memorial International Grant**  
Robert Weeden  
*In memory of Bob and Ramona Sneider*

**Marilyn Atwater Memorial Grant**  
Sheng He

**Richard W. Beardsley**  
**Named Grant**  
Katharine Lee Avary

**Don R. Boyd Memorial Grant**  
James Farmer  
Charles J. Franck

**Fred A. and Jean C. Dix**  
**Named Grant**  
James E. Briggs

**Eastern Section Named Grant**  
Katharine Lee Avary

**Norman H. Foster**  
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*In memory of Jay McMurray*

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Mark Nicholas Beeson

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Julius Homer Johnson  
Michelle Judson  
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Walter W. McMahan Jr.  
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Wesley S. Northup  
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William Wilson Rathke  
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A A P G F O U N D A T I O N

# Meeting Challenges ASSURING SUCCESS

## DISTINGUISHED LECTURE PROGRAM

*In the early years of the Distinguished Lecture tour great scientists like M. King Hubbert and W. C. Krumbein endured challenging journeys by train. Although the journey was rough due to WWII rationing and strictures, they pressed on and completed their tours with much help from local societies and their officers.*



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## HOW CAN YOU HELP?

The Foundation has a goal of adding at least \$1,000,000 to the Distinguished Lecture/Instructor General Fund and \$3,000,000 to New Named Distinguished Lectures to secure the program's success against increasing costs and will in turn boost growth of the geosciences in the future.

Every gift received is of vital importance to this program and all donors to the Distinguished Lecture/Instructor General Fund will receive recognition in the AAPG Explorer. Those who desire to become a major donor with a gift of \$300,000/\$350,000 to endow a Named Domestic Distinguished Lecture/Named International Distinguished Lecture, you will receive recognition in an exclusive article in the AAPG EXPLORER in addition to the listing in

the Foundation's Annual Report.

You may direct your tax-deductible contribution toward the AAPG Foundation "Distinguished Lecture/Instructor General Fund." Contributions are accepted by check, credit card by phone, or online at <http://foundation.aapg.org/contribute.cfm>.

To receive a 5-year pledge commitment form or for further details regarding the Distinguished Lecture/Instructor General Fund or Distinguished Lecture Named Endowment Funds, please contact Rebecca Griffin 918-560-2644.







## UPCOMING REGIONAL WORKSHOPS

9/10 & 11 **West Coast:** Artificial Lift Systems - Long Beach (9/10) and Bakersfield (9/11), CA.

9/11 **Midcontinent:** Utilizing GPS in Oil & Gas Operations (EKOGA) - Chanute, KS.

9/17-19 **Rocky Mountain:** Paradox Basin Field Trip (RMAG) - Southeast Utah

9/18 **Eastern:** Reservoir Characteristics of the Trenton-Black River in Michigan, Presentations & Core Workshop - Kalamazoo, MI.

9/22-23 **Rocky Mountain:** Symposium: Rocky Mountain "Dusters" Lessons Learned and Opportunities Created (RMAG) - Denver, CO.

9/23 **Rocky Mountain:** Risk Management Short Course (RMAG) - Denver, CO.

9/23 **Texas/SE New Mexico workshop:** How to Start/Fix/Manage A Small Waterflood - Hobbs, NM.

9/30 **Central/Eastern Gulf:** Bossier/Haynesville Shale (Shreveport Geological Society) - Shreveport, LA.

10/11 **Eastern:** Workshops in Conjunction with AAPG/SPE Eastern Meeting - Pittsburgh, PA.

- 10/11 Geology & Geophysics Applied in Industry (ExxonMobil)
- 10/11-12 Shale Gas Project Planning
- 10/15 Shale Fracturing Completions
- 10/15 Computer Mapping for Petroleum Exploration

For further information, view PTTC's online calendar at [www.pttc.org/national\\_calendar.htm](http://www.pttc.org/national_calendar.htm)



## Registration Is Now Open For North America's Largest Unconventional Gas Conference

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**Calgary Telus Convention Centre**

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MURRAY SMITH, *Energy Advisory Board, TD Securities*

**The Challenge of North American Gas**  
DAVE RUSSUM, *Vice-President, Geoscience, AJM Petroleum Consultants*

**The Changing World of Natural Gas**  
PETER TERTZAKIAN, *Chief Energy Economist and Managing Director, ARC Financial Corp.*

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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](http://www.aapg.org), or by contacting headquarters in Tulsa.

### For Active Membership

#### Alaska

Head, Jennifer Adair, ConocoPhillips, Anchorage (L. Wright, J. Walters, P. Doherty); Schwantes, David G., MTL Consulting, Wasilla (N.B. Waechter, B.G. Reddick, R. Bailey)

#### Colorado

McLaughlin, Mark Carl, Pason Systems (USA), Grand Junction (D. Folkes, B. Nagel, J. Mitchell); Welty, Kyle Robert, self-employed, Trinidad (N.B. Waechter, G.G. Forney, R.J. Bailey)

#### Montana

Borzomato, Alan Joseph, consultant, Glendive (R.L. Clement, J.D. McBane, D. Wilcox)

#### New York

Guscott, Simon Christopher, Hess Corp., New York (D.E. Ballentine, A.S. Pepper, S.D. Burley)

#### Ohio

Wheeler, Don C., NGO Development, Newark (G.L. Mason, M.A. Neese, L.H. Wickstrom)

#### Oklahoma

Xia, Zunyi, Cimarex, Tulsa (J.G. McCaskill Jr., C.L. Johnson, J.F. Weber)

#### Texas

Baker, Ralph N., Baker Associates, Kingwood (reinstate); Blaisdell, David W., ExxonMobil Exploration, Houston (A.W. Schnacke Jr., J.S. Campbell, J.M. Ajdukiewicz); Cross, Joseph William, ConocoPhillips, Houston (B.K. Reitz, L.A. Czerniakowski, J.W. Serbeck); Figueredo, Patricio H., ExxonMobil, Houston (M.T. Weaver, C.J. Lopez, S.J. Hippler); Gouveia, James, Rose and Associates, Houston (G. Citron, J. MacKay, R. Young); Harry, Brian E., Allenture, Houston (reinstate); Holifield, Mark Wyatt, Anadarko Petroleum, Houston (R.B. Nelson, L.A. Evans, J.L. Kamm); Hoyt, Jennifer Nice, ExxonMobil, Houston (W.A. Gregory, K.B. Anderson, S.W. Young); Jacobs, Joseph Richard, Anadarko Petroleum, Houston (J.K. Stacy, M.E. Podell, A.K. Berry); Jumper, Stephen C., Dawson Geophysical, Midland (M.A. Raines, J.M. Party, L.D. Dawson); Labbe, Kevin James, Marion Energy, Dallas (J.C. Pinkerton, D.S. Johnson, R.T. McKenzie); Ma, Hong, ExxonMobil, Houston (D.M. Advocate, C.W. Kiven, M.F. McGroder); Manley, Hunter Johnson, Fasken Oil & Ranch, Midland (D.L. Harmon, D.T. Grace, J.W. Laufer); Okunola, Isaiah Adebayo, ExxonMobil Development, Houston (P. Varnai, C.A. Paschke, P.I. Ochogbu); Parvin, Taru Kristiina, Cimarex Energy, Irving (K.T. Nordstog, R.E. Worthington, G.L. Hair); Rodgers, Kirk, Schlumberger, Houston (K.S. Glaser, K.E. Nemeth, D.R. Paddock); Sanchez-Ferrer,

Fernando, Shell International E&P, Houston (A. Tisi, C. Griffith, G. Enciso); Walton, Gene David, BP, Houston (W.M. House, S. Petmecky, D.H. Wilson)

#### Virginia

Desselles, Richard Paul Jr., Minerals Management Service, Herndon (H.E. Syms, G.F. Dellagiarino, K. Huang); Janson, Gus William, Range Resources - Pine Mountain, Abingdon (J.H. Grantham, C.C. Moyer, B. Wison); Sinemus, Lydia Jane, Range Resources-Pine Mountain, Abingdon (J.H. Grantham, J.E. Wilson, C.C. Moyer)

#### West Virginia

Henkes, Colin A., Patriot Coal, Charleston (E. Custer, M. McClure, K.W. Suehs)

#### Angola

Mavatikua, Lubanzadio, BP, Luanda (D.N. Hilkewich, D.D. Haun, A.M. Carter)

#### Australia

Barclay, Stuart Adrian, SRK Consulting, Sydney (M. Faiz, H. Volk, N. J. Russell); Begg, Stephen H., University of Adelaide, Adelaide (J.G. Kaldi, R.B. Ainsworth, R.R. Hillis); Drummond, Gary Stuart, Pangaea Resources, Sydney (A.R. Scott, J. Alexander, P.A. Ardittio)

#### Brazil

Medeiros, Walter Eugenio, University Fed Do Rio Grande Do Norte, Natal (E. Faria, R.M.D. De Matos, V.H. Neumann)

#### Canada

Warren, Marian, EnCana, Calgary (M. Cooper, J.R. Hogg, M.D. Hewitt)

#### Colombia

Vargas-Jimenez, Carlos Alberto, Agenoa Nacional de Hidrocarburos, Bogota (T. Villamil, M. Garcia-Gonzalez, A.U. Kammer)

#### France

Leandri, Patrick, Beicip-Franlab, Rueil-Malmaison (Y. Coury, B. Coletta, J. de Galard); Murat, Bruno, Beicip-Franlab, Rueil-Malmaison (Y.J. Coury, R.H. Bate, R. Higgs)

#### India

Dhuria, Krishna Kumar, Oil and Natural Gas Corp., Baroda (M.P. Mehra, T.K. Mathuria, S.K. Das, III); Mukherjee, Supriya, Cairn Energy (India), Gurgaon, Haryana (B. Kunjan, S. Sarkar, N.K. Senapati); Mukhopadhyay, Dilip K., Indian Institute of Technology Roorkee, Uttarakhand (J. Peters, S.K. Das III, R. Kumar); Roy, Shouvik, BGEPIL, Mumbai (S. Roy, S. Dasgupta, S. Patra)

See **Membership**, page 71

## Certification

The following are candidates for certification by the Division of Professional Affairs.

### Petroleum Geologist

#### Florida

Pass, David A., Environmental Resources Management, Jacksonville (reinstatement)

#### Texas

Scott, Thomas D. Jr., DeGolyer and MacNaughton, Dallas (reinstatement)

## Inmemory

Charles M. Allen, 89  
Tulsa, May 11, 2008

Francis J. Barker, 88  
San Marino, Calif., Feb. 23, 2008

Charles A. Barton Sr., 81  
Lafayette, La., May 1, 2008

Linda A. Ewing, 60  
San Antonio, June 27, 2008

McLain J. Forman, 79  
New Orleans, June 21, 2008

David T. Gleim, 79  
Centennial, Colo., Feb. 10, 2008

John D. Lomax, 83  
Dana Point, Calif., June 23, 2008

Vance M. Lynch, 80  
Liberty Hill, Texas, July 4, 2008

Charles E. Mear, 80  
Austin, Texas, Sept. 18, 2007

J. Theodore "Ted" Sandberg, 76  
Wichita, Kan., July 13, 2008

Raymond T. Stotler Jr., 92  
Dallas, June 11, 2008

Robert A. Warner (AC '54)  
Lewisville, Texas

Richard L. Woodhams, 81  
Houston, May 31, 2008

John L. Wroble, 79  
Casper, Wyo., April 8, 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. Asterisk denotes AAPG Honorary Member.)





# The North Sea after 40 years.

I am pleased to invite you this two-day conference in Oslo 6th and 7th October. The aim of the conference is to pose the question - After more than 40 years of varied upstream activity in the North Sea petroleum province what are the key learning to take forward into the future? A set of invited presentations will track the creation of the present day North Sea petroleum province through the decades, highlighting the critical factors for success and the opportunities and challenges ahead.

*Geir Lunde, General Chairman*

## Day 1

Looking Back - History of the North Sea: Geology and E&P  
A. Armour (Revus)

The Schoonebeek Field (past-present-future)  
M. de Keijer (NAM)

The Groningen Field- Managing a Giant  
J. Steenbrink (NAM)

The Ekofisk Field (past-present-future)  
H. Hermansen (ConocoPhillips)

Technology Enablers for the Successful development of the Brent Field (past-present-future)  
D. Sharpe and T. Allen (Shell)

Gullfaks Field - Towards 2030  
P. Helland (StatoilHydro)

The Role and Status of E&P Technology from a North Sea Perspective: History and Future  
S. Stranden (PGS)

The Forties Field (past-present-future)  
J. Crowley (Apache)

Elgin/Franklin: What Could We Have Done Differently?  
E. Festa and O-P. Hansen (Total)

The Draugen Field:  
Even On World Class Reservoirs People Make The Difference  
N. A. Horvei (Shell)

Schiehallion Field:  
Discovery, development and innovations applied during production 'invited' (BP)

The Ormen Lange Field  
P. Kjernes (StatoilHydro)

Buzzard Soars To Success:  
The Discovery and Development of a Billion Barrel Oil Field in a Mature Basin  
M. Burdek (Nexen)

## Day 2

Looking Forward - Future Challenges of North Sea  
T. Dodson (Statoil)

The Luno Discovery and the Future of N/UK Exploration  
H. Ronnevik (Lundin)

The Troll Field (past-present-future)  
T. Madsen (StatoilHydro)

HR Perspectives on the North Sea Petroleum Industry  
H. Aalheim (StatoilHydro)

The Next Generation's View of the Future  
A. Korevaar and M. Nyrod (Shell/Sagex)

Environment In Focus  
A. K. A. Sjøtveld (KonKraft)

A New Paradigm:  
Oilexco, from New Entrant to the Most Active Driller in the UKCS  
R. Christensen (Oilexco)

The Challenge of Deep HPHT Exploration  
J. Mathew (ConocoPhillips)

New Technologies Employed with Success in the Danish Sector and the Management of Risk  
M. Aagsen (DONG)

Heavier Oils: Moving From Unloved Resources to Reserves  
S. Jenkins (Nautica)

PANEL DISCUSSION Chairman - A. Armour  
Government: Denmark

F. O. Rasmussen (Energistyrelsen)

Government: Netherlands

P. Jongerius (Ministerie van Economische Zaken)

Government: United Kingdom

Peter Haile (bERR)

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## READERS'forum

**Timing is Everything**

Regarding Scott Tinker's commentary on "Energy Myths and Realities" (August EXPLORER): This is a very clear statement – one of the better ones that I have read on the subject.

Perhaps it is luck or great timing that Scott Tinker is AAPG's current president, because he clearly and eloquently articulates the current energy issues of our time. For that reason, he will give AAPG credibility where it counts (at last).

George Devries Klein  
Sugar Land, Texas

**Making It Personal**

Regarding Scott Tinker's President's

Column ("When Questioned, Take It Personally," August EXPLORER): It is so refreshing to at last hear some "plain speak" about gasoline prices and crude supplies.

I am amazed that the politicians in both of our countries just don't get it. Thanks for speaking out.

Darol J. Wigham  
Calgary, Canada

Actually, I "take it personally" when folks (Scott Tinker in this case) use a comparison of the cost of gasoline to the cost of Starbucks coffee.

I continue to think that this is a terrible analogy, as we all rely on gasoline (thus HAVE to buy gasoline)

*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.*

and Starbucks is discretionary and we do NOT HAVE to buy coffee.

This is a very tired and misused analogy!

Richard Boyd  
Folsom, Calif.

PROFESSIONAL  
newsbriefs

**Chris Armistead**, to geologist, Linn Energy, Tulsa. Previously geologist, Lamamco Drilling, Skiatook, Okla.

**Gregory Lee Brown**, to geophysicist, Stone Energy, Houston. Previously geophysicist, Marathon Oil, Houston.

**Steve Carlson**, to senior geophysicist, Maersk Oil America, Houston. Previously chief technical officer, GeoPatterns Technology, Houston.

**Edgar K. Cross**, to staff geologist, Shell Nigeria, Lagos, Nigeria. Previously senior geologist, Shell Rijswijk, Netherlands.

**Arnoud de Feyter**, to exploration manager, Eni Congo, Pointe-Noire, Republic of Congo. Previously deputy exploration general manager, Agiba, Egypt.

**Paul D. Gerome**, to exploration manager-unconventional resources, Southwestern Energy, Houston. Previously senior vice president-geology and geophysics, CDX Gas Corp., Birmingham, Ala.

**Lane R.B. Hammons**, to senior operations geologist, Common Resources, The Woodlands, Texas. Previously operations geology and petrophysics manager, StatoilHydro North America, Houston.

**Dennis N. Hilkewich**, to E&P project manager, BP (China), Beijing, People's Republic of China. Previously well operations team leader, BP Angola, Luanda, Angola.

**Bertram Hayes-Davis**, to vice president-oil and gas asset management, JPMorgan Chase Bank, Dallas. Previously fiduciary officer, JPMorgan, Colorado Springs, Colo.

**Jack L. Kerfoot**, to vice president-Australia exploration, Murphy E&P, Perth, Australia. Previously vice president-Gulf of Mexico exploration, Murphy E&P, Houston.

*(Editor's note: "Professional News Briefs" includes items about members' career moves and honors. To be included, 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.)*



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*Personal touch is persuasive*

# Joining AAPG Is Now Easier

By VICKI BEIGHLE  
AAPG Membership Manager

AAPG's membership has experienced some growth, both domestically and internationally, but the increase could be better ... should be better ... and can be better with a little help from you, our members.

How?

Invite others to join AAPG.

It's easy – and effective. Nothing works as well as personal contact when it comes to attracting new members to AAPG.

And if any more incentive was needed, just remember AAPG's Recruitment, Reward and Recognition Program, which was created to help increase the AAPG Active membership and recognize and reward the members who work toward this achievement.

The more members you recruit, the more points you get, which can be applied toward nice reward gifts; and more points means more members, making AAPG even better. It's a win-win situation for all.

And while the program is not a "contest" – RRR is an on-going program allowing recruiters to accumulate points for as long as they wish – there are tangible rewards, too, such as beautiful one-of-a-kind mineral and fossil specimens, like fossil fish, polished ammonites, petrified wood book ends, onyx bowls, amethyst geodes and megalodon shark teeth.

Or, you can simply take an AAPG Bookstore voucher of equal value.

We currently have over 450 participants – but we want more!

You may be asking yourself – if I get one person to join, will it really make a difference?

YES! If each member recruited just ONE person we would double our membership within this fiscal year.

It is easy to get started – after all, you're simply asking people to join you in the world's greatest geosciences organization, right?

Need some ideas? How about:

- ✓ Send colleagues an e-mail.
- ✓ Sit down over some coffee or lunch (or other social event) and simply ask them to join.

- ✓ Schedule an AAPG recruitment presentation at local talks or a professional meeting.

- ✓ Find out if your company supports the importance of belonging to professional societies and request to become an AAPG ambassador.

Companies will benefit by developing their staff as international members of a global community, as well as encouraging greater knowledge, advancing language and technical skills.

## Student Dues

Students – have you renewed your AAPG membership dues yet?

Chevron is the current sponsor of student membership dues, but as a student it is your responsibility to request the sponsorship each year.

To renew your dues with the Chevron sponsorship go online to: [http://students.aapg.org/corporate\\_sponsorship.cfm](http://students.aapg.org/corporate_sponsorship.cfm)

There you can complete the form online and submit or save for later and fax or mail it to AAPG.

Don't miss out on your valuable AAPG member benefits. Renew today!

- ✓ Share your personal story with potential members: Tell them honestly why you joined, why you have maintained your membership and be sure to explain or outline the benefits of belonging to our organization.

- ✓ Outline the benefits of membership; access to the latest industry news and advancements in the science, two monthly publications (EXPLORER and BULLETIN), new graduated dues structure, annual conferences (domestic and international), technical programs, education, *Search and Discovery* e-journal, special publications, digital products, member discounts on publications, conferences, short courses and online training, access to the Foundation Library and many more.

Don't forget personal benefits such as access to health, life, car and home owners insurance and car rental discounts.

Joining is easier than it's ever been.

Applicants can join online ([www.aapg.org/join](http://www.aapg.org/join)) or download a form. If you prefer to personally hand them a form you can download and print these yourself, or just contact Member Services ([members@aaapg.org](mailto:members@aaapg.org)) and ask for a supply of forms.

After a person joins, it is important to try to find ways to get them active; invite them to local talks, meetings and conventions, so they begin to develop that broader network of knowledge and contacts.

Want to know the Who's-Who of recruiting? Check out our Web site ([www.aapg.org/recruit/](http://www.aapg.org/recruit/)) and look at the list of recruiters. Here you also will find recruiting tips as well as complete information on the program.

You can have wonderful rewards – and you can help AAPG become even better.

Share the knowledge, share the benefits, share the science. Recruit someone today. □

Guargena, J.S. Jahren, E. Sletten Forusgreen)

### Pakistan

Khan, Mudassar Zubair, Pakistan Petroleum, Karachi (S.M. Raza, R.A. Siddiqui, S. Rafi)

### People's Republic of China

Jiang, Tao, China University of Geosciences, Hubei (X. Xie, J. Ren, H. Wang)

### Thailand

Anant-Raksakul, Nawee, PTT Exploration and Production, Bangkok (R.C. Shoup, P. Suwanruji, T. Ampaiwan); Satarugsa, Peangta, Khon Kaen University, Amphoe Maung, Khon Kaen (S. Tanprasat, R. Shoup, H. Darman)

### Yemen

Baraba, Rasheed Saleh, Ministry of Oil and Minerals, Sana'a (R.A. Levey, R.B. Sorkhabi, D.K. Curtiss) □

## Membership

from 68

### Indonesia

Chaoyang, Zha, CNOOC SES, Jakarta (X.L. Ye, T. Xia, W. Shen)

### Netherlands

Rudolph, Tobias, Shell E&P, Rijswijk (M.R. Hempton, B.E. Prather, D.B. Alsop)

### Nigeria

Olafiranye, Kehinde, Chevron, Lagos (T. Schirmer, T.S.A. Akewusola, O.E. Ajao); Ulu, Ogbonnaya Kalu, Chevron Nigeria, Lagos (F. Udegbonam, A.R. Ojelabi, K.K. Kanu)

### Norway

Bruvoll, Marianne, PA Resources, Oslo (C.



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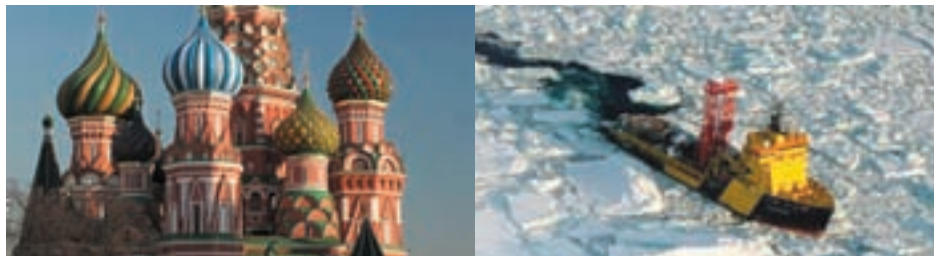
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From mature basins to new frontiers

30<sup>th</sup> March – 2<sup>nd</sup> April 2009

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Steve May, ExxonMobil – Global petroleum systems

### Europe

NW Europe giant fields – old and new

### Russia, FSU & Circum Arctic

Steve Matthews, Bujak Research International – The Azolla story: Implications for climate change and Arctic petroleum source rocks

### North Africa and the Middle East

Pieter Spaak, Shell – Pan-African imprint of Phanerozoic play elements

### Passive Margins

Martin Jackson, University of Texas – Unfolding concepts in salt tectonics: intrusive plumes, salt-sheet thrusts, minibasin triggers and exotic wanderers

### Unconventional Hydrocarbons

Richard Chuchla, ExxonMobil – Unconventional resources: Turning conventional paradigms upside down

### Geo-Controversies

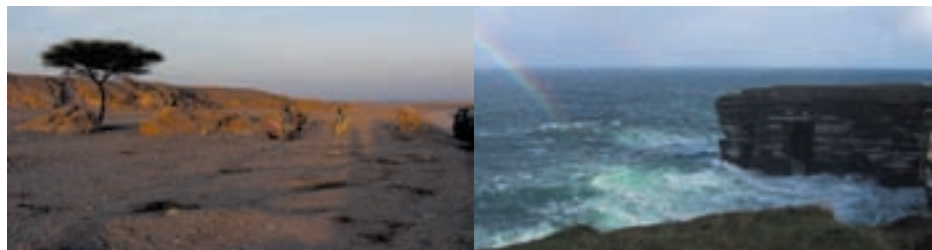
Are NOC's the future of the petroleum industry?

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hr@austingeo.com

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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## THE PETROLEUM INSTITUTE

### ABU DHABI, UNITED ARAB EMIRATES

**Institution:** The Petroleum Institute (PI) was created in 2001 with the goal of establishing itself as a world-class institution in engineering education and research in areas of significance to the oil and gas and the broader energy industries. The PI's sponsors and affiliates include Abu Dhabi National Oil Company and four major international oil companies. The campus has modern instructional laboratories and classroom facilities and is now in the planning phase of three major research centers on its campus. The PI is affiliated with the Colorado School of Mines, the University of Maryland (College Park), and Leoben and Linz Universities. PI is in the process of developing future working relationships with other major universities and research institutions around the world to capitalize on joint research areas of interest. For additional information, please refer to the PI website: [www.pi.ac.ae](http://www.pi.ac.ae).

## PETROLEUM GEOSCIENCES ENGINEERING POSITIONS

The Petroleum Institute in Abu Dhabi is seeking applications in Petroleum Geosciences Engineering for the following positions:

**Program Director**  
**Faculty at all levels**  
**(Chaired and Distinguished Professor,**  
**Professor, Associate Professor, Assistant Professor)**  
**Research Associate**  
**Research Assistant**  
**Lab Engineer**  
**Post Doc Fellows**

Candidates are encouraged to submit applications at the earliest convenience. Review of applications begins upon receipt and positions remain open until successfully filled.

Details are available on PI-web site: <http://www.pi.ac.ae/jobs>

## CLASSIFIEDads

### POSITION AVAILABLE

#### U.S. Geological Survey Mendenhall Postdoctoral Research Fellowship Program

The U.S. Geological Survey (USGS) invites applications for the Mendenhall Postdoctoral Research Fellowship Program for Fiscal Year 2010. The Mendenhall Program provides opportunities to conduct research in association with selected members of the USGS professional staff. Through this Program the USGS will acquire current expertise in science to assist in implementation of the science strategy of its programs. Fiscal Year 2010 begins in October 2009.

Opportunities for research are available in a wide range of topics. The postdoctoral fellowships are 2-year appointments. The closing date for applications is November 12, 2008. Appointments will start October 2009 or later, depending on availability of funds. A description of the program, research opportunities, and the application process are available at <http://geology.usgs.gov/postdoc>. The U.S. Geological Survey is an equal opportunity employer.

#### TENURE-TRACK POSITION IN EXPLORATION GEOPHYSICS BOONE PICKENS SCHOOL OF GEOLOGY OKLAHOMA STATE UNIVERSITY

The Boone Pickens School of Geology at Oklahoma State University (OSU) invites applications and nominations for a geophysicist with strong research background to fill a tenured or tenure-track position in exploration geophysics at any rank (assistant, associate, or full professor). In addition, distinguished applicants with demonstrated international reputations, meeting the requirements for full professor will be considered for the Boone Pickens Chair of Exploration Geophysicist. Applicants are required to have a Ph.D. degree in geophysics or related field at the time of appointment.

The applicants should have a broad background in the geophysical sciences. Specific research areas may include, but are not restricted to seismology, seismic data processing and quantitative seismic analysis for reservoir characterization, reflection seismology, electromagnetic techniques, and ground penetrating radar. Applicants must have a strong research and publication record and a demonstrated ability to attract external funding. Salary and benefits will be competitive and commensurate with experience and future potential.

The successful candidate will be expected to pursue a vigorous research program and help strengthen our petroleum geosciences program. The candidate will supervise M.S. and Ph.D. students and develop courses in his or her specialty and participate in preparing students for employment in the energy and environmental industries.

The successful candidate will join a faculty of twelve geoscientists, including two other geophysicists, and will be part of a sedimentary geology and tectonics research group that include six other faculty and has close ties to the petroleum industry. The School of Geology has a well equipped geophysical laboratory with a Geometrics 48 channel seismograph, an Iris Syscalpro 10 channel resistivity system, an AGI Supersting resistivity system, a Scintrex C-G5 gravimeter, a Geometrix control source audio magnetelluric system (Stratagem), a Pulse Ekko GPR system, a Geonics EM-34 system, a Geometrics 858 Cs vapor magnetometer, and state of the art software for processing both potential field and seismic data. In addition the School has recently constructed the Devon Teaching and Research Laboratory, which contains state-of-the-art 3-D image processing facilities.

Applicants are encouraged to submit a complete vita/resume, statement of research and teaching interests, and a list of five references, including names, phone numbers, e-mail addresses, and complete mailing addresses to: Geophysics Search,

Boone Pickens School of Geology, 105 Noble Research Center, Oklahoma State University, Stillwater, Oklahoma 74078-3031. Phone: (405) 744-6358. Fax: (405) 744-7841. Screening of candidates will begin in November 2008 and will continue until the position is filled. The starting date for this position will be Fall Semester 2009 or as negotiated.

Inquires about this position may be directed to Dr. Estella Atekwana ([estella.atekwana@okstate.edu](mailto:estella.atekwana@okstate.edu)) or Dr. Jay Gregg ([jay.gregg@okstate.edu](mailto:jay.gregg@okstate.edu)) at the above address. More information on OSU and the Boone Pickens School of Geology can be found on the web <http://osu.okstate.edu/> and <http://geology.okstate.edu/> respectively.

Committed to health and safety Oklahoma State University maintains a tobacco free work environment.

Oklahoma State University is an Affirmative Action/Equal Opportunity/E-Verify employer committed to diversity.

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#### EarthWater Global Megawatershed Development Exploration Geologist / GIS Expert

**Company Description:** EarthWater Global uses proprietary exploration protocols to locate, develop, and manage previously overlooked, large-scale, sustainable groundwater resources to help governments and other entities solve their fresh water shortages. For more information, see [www.earthwaterglobal.com](http://www.earthwaterglobal.com).

#### Desired Experience / Qualifications:

- Proficient in GIS and Visualization Software Applications in the Earth Sciences and Cartography
- Training and 10+ years experience in Geological exploration programs, preferably in the private sector
- Degree and/or professional experience in geology, geography, or cartography GIS data management
- Outstanding administrative and organizational skills
- Proficiency in the use and application of ARC GIS and related software

#### Specific Duties / Responsibilities:

- Position will require the handling (i.e., database, edit, load, maintain, and manage) of a wide variety of land, geological, geophysical, and engineering/well data
- Manage and maintain all components of enterprise GIS and exploration databases
- Perform certain geological mapping and GIS analysis
- Maintain and manage certain components of data room (repository) by collecting, organizing, and processing hard copy and digital land, geological, geophysical, and engineering data

**Benefits:** The chance to work with world-class scientists on the cutting edge of groundwater exploration to solve the world's water shortages. Compensation is attractive and includes equity stake in a well-financed, high growth company. Benefit package is exceptional and includes medical insurance, life insurance and retirement plan.

**Contact: Peter Karlen; [jobs@ewg-llc.com](mailto:jobs@ewg-llc.com); +1 (212) 342-7438; +1 (917) 691-0792**

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 or fax (512) 263-3546.

continued on next page

### EnCana Chair in Unconventional Gas

The **University of Calgary** invites applications for a Chair in Unconventional Gas in the Department of Geoscience ([www.ucalgary.ca/geoscience](http://www.ucalgary.ca/geoscience)) at the level of **tenure-track Associate/Full Professor**. We are looking for a senior scientist to build an internationally renowned geoscientific program in unconventional gas research.

The successful candidate will have a PhD and an international reputation in their field of research covering major aspects of the science and engineering involved in exploring for and producing unconventional gas reservoirs. Possible research areas might include one or more of tight gas, shale gas, coal bed methane or gas hydrates. The candidate will work with researchers in the departments of Geoscience, Chemical and Petroleum Engineering, and Mechanical Engineering, where there are ongoing activities in unconventional gas. The successful candidate will build a vigorous, externally funded research program that will become an internationally leading centre for developing innovative solutions to the challenges presented by the exploration and development of unconventional gas.

Evaluation of applications will begin **October 31, 2008** and continue until the position is filled. Additional information about the position and the application process can be found at [www.ucalgary.ca/hr/careers](http://www.ucalgary.ca/hr/careers) or by contacting [geojobs@ucalgary.ca](mailto:geojobs@ucalgary.ca)

*All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. The University of Calgary respects, appreciates and encourages diversity.*

*To see all University of Calgary academic positions, please visit: [www.ucalgary.ca/hr/careers](http://www.ucalgary.ca/hr/careers).*





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**EarthWater Global  
Megawatershed Development  
Vice President, Exploration**

*Company Description:* EarthWater Global uses proprietary exploration protocols to locate, develop, and manage previously overlooked, large-scale, sustainable groundwater resources to help governments and other entities solve their fresh water shortages. For more information, see [www.earthwaterglobal.com](http://www.earthwaterglobal.com).

*Desired Experience / Qualifications:*

- An advanced degree in Geology or Geophysics
- 15+ years of economic minerals and/or petroleum exploration experience and a demonstrated ability as an earth scientist, project leader, and business manager
- Experience building and developing a team, setting direction, developing programs, and bringing them to fruition; track record of increasing team performance
- Capable of developing and implementing strategic decisions
- Organized and disciplined; well-developed oral and written communication skills; able to communicate well and deal persuasively with all levels
- Reputation for integrity, maturity, and sound business judgment

*Specific Duties / Responsibilities:*

- Position will report directly to the President
- Communicate and coordinate with regional and governmental leaders and agencies
- Formulate strategies and review exploration objectives, budgets, and plans; establish criteria to measure operations and regularly evaluate results against established standards
- Expand the company's exploration program by leading the generation of new concepts on a continuing basis; develop and implement a structured screening process for project identification and evaluation
- Work with regional management to maintain a sound plan to ensure technical expertise, professional development, and timely staffing
- Design exploration programs and rank new prospects; ensure that quality standards are met, milestones are achieved, and costs are managed on each ongoing project

*Benefits:* The chance to work with world-class scientists on the cutting edge of groundwater exploration to solve the world's water shortages. Compensation is attractive and includes a significant equity stake in a well-financed, high growth company. Benefit package is exceptional and includes medical insurance, life insurance and retirement plan.

Contact: **Peter Karlen; [jobs@ewg-llc.com](mailto:jobs@ewg-llc.com);**  
**+1 (212) 342-7438; +1 (917) 691-0792**

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**MontanaTech  
THE UNIVERSITY OF MONTANA  
Geo-Energy Engineering**

The Department of Geological Engineering in the School of Mines & Engineering at Montana Tech invites applications for a tenure-track position in Geo-Energy Engineering. The successful candidate will be expected to teach a wide variety of undergraduate and graduate-level courses related to Montana Tech's Geological, Geophysical and Petroleum Engineering degree programs, which are accredited by ABET. Development of a funded program of research with publishable results is expected. Responsibilities also include student advising, recruiting, and industrial relations.

The appointment will be at the rank of Assistant or Associate Professor, depending upon qualifications and experience, starting in August 2008. A Ph.D., or ABD, in Geological, Energy or Petroleum Engineering, or a closely related field, is required at the time of appointment. A PE license, or EIT certificate, and significant energy industry

experience are preferred. Candidates must have excellent communications skills in both spoken and written English. Review of applications will begin immediately and the position will remain open until filled. Applicants should send a resume, transcripts, a statement of teaching and research interests and the names, addresses, and telephone numbers of three professional references to Cathy Isakson, Montana Tech, 1300 West Park Street, Butte, Montana 59701.

Montana Tech promotes excellence through diversity and women and members of underrepresented groups are encouraged to apply.

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**CLASSIFIED ADS**

You can reach about 30,000 petroleum geologists at the lowest per-reader cost in the world with a classified ad in the EXPLORER.

Ads are at the rate of \$2.10 per word, minimum charge of \$42. And, for an additional \$50, your ad can appear on the classified section on the AAPG web site. Your ad can reach more people than ever before.

Just write out your ad and send it to us. We will call you with the word count and cost. You can then arrange prepayment. Ads received by the first of the month will appear in the subsequent edition.

## North Sea Highlighted At Oslo Conference

A comprehensive look at the industry's past and future in the North Sea will be highlighted at this year's AAPG European Region conference, set Oct. 5-7 at the Hotel Bristol in Oslo, Norway.

The meeting's theme is "The North Sea After 40 Years," and organizers have crafted a technical program centered on the question:

After over 40 years of varied upstream activity, what are the key lessons from the North Sea to take forward in the future?

To do this, the conference will focus on five main themes:

- ✓ Exploration and production innovation.
- ✓ Technological development.
- ✓ Environmental protection.
- ✓ Attracting and developing the next generation.
- ✓ Fiscal and commercial structures and incentives.

"The quality of the technical program is outstanding and I am very happy that the technical program committee has been able to attract such high level speakers covering all the most important aspects of the North Sea," said Geir Lunde, conference general chair.

"Geologists should be attracted and excited at the opportunity to participate in such an event where important learning points and attractive

opportunities for the future are presented and discussed in two effective days," he said.

"My personal view is that the North Sea will be one of the world's best places to test out and prove new value adding technologies both within exploration and production in mature provinces," he added.

"Companies active in the North Sea will be among the first to harvest from this development."

The program includes presentations on all the latest activities, techniques and technologies that are part of the North Sea story. Some of the highlights include:

- ✓ A look at the history of the North Sea.
- ✓ Maintaining production and development in some of the mature giant oil fields by major IOCs.
- ✓ The latest applications of technology.
- ✓ A panel discussion with representatives from the UK, Netherlands, Denmark and Norway presenting their views on the region's future.
- ✓ The role and status of E&P technology from a North Sea perspective.
- ✓ Several case studies and exploration stories.

Meeting details and registration is available online at [www.aapg.org/oslo](http://www.aapg.org/oslo). □



## Alberta Geological Survey

[www.ags.gov.ab.ca](http://www.ags.gov.ab.ca)

### Stratigraphic Mapping Career Opportunities

Alberta Geological Survey (AGS) provides geoscience information and expertise to government, industry and the public to support exploration, development, conservation and regulation of Alberta's energy, mineral and groundwater resources.

Within the AGS Mapping Section, we are creating the first digital atlas of Alberta's geology. Additional geologists are needed to map and interpret the lithostratigraphy and sequence stratigraphy of the Western Canada Sedimentary Basin, the Rocky Mountains and the Rocky Mountain Foothills within Alberta. Motivated individuals with expertise in both two-dimensional and three-dimensional stratigraphic mapping are required for the positions listed below.

**Clastic Stratigrapher:** Ph.D. (preferred) or M.Sc.

**Carbonate Stratigrapher:** Ph.D. (preferred) or M.Sc.

**Mapping Geologist:** M.Sc. (preferred) or B.Sc.

At AGS, you will have the opportunity to work in a stimulating environment on challenging field and office-based projects, work with advanced technology, and remain current in your field while making significant contributions to your community of practice.

**Join us and enjoy the Alberta advantage!**

Please visit [www.ags.gov.ab.ca/employment.html](http://www.ags.gov.ab.ca/employment.html) for full job descriptions and application details.



## STAFF GEOLOGIST HOUSTON, TEXAS



Minimum Qualifications:

- B.S. degree in Geology required with strong academic record;
- M.S. degree or 3+ years prospect and generation experience required;
- Experience with geological mapping software and in seismic interpretation with workstation package experience a plus.

Based in Williston, ND, Western Standard Energy Corp. is an independent oil & gas exploration company with vast acreage in Montana and North Dakota. The company is expanding at a rapid pace and offers an excellent compensation package, comprehensive benefits and a generous stock option package.

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## DIRECTOR'S corner

## Olympian Schedule Set for Fall

By RICK FRITZ

As I write my column this month I realize I am experiencing a condition called "Olympic Junkie Syndrome" or "OJS." I love to watch the Olympics and each night I am glued to the TV watching the best athletes of the world meet and compete.

The funny thing is I find myself watching anything – skeet shooting, team handball, synchronized springboard diving, beach volleyball – things I would never stop to watch if they were on TV any other time of the year.

There is just something special about the Olympics – something that makes you want to be there and be a witness to the event.



Fritz

\* \* \*

AAPG is about to start its Olympian schedule of events for the fall.

Of course, the "big event" is the **AAPG International Conference and Exhibition (ICE)**. This year's ICE is in Cape Town, South Africa, and it promises to be a great event (see related story, page 54).

Cape Town is an excellent venue and we have great hosts this year with the Geological Society of South Africa and our diamond sponsor, PetroSA, plus the support of the AAPG Africa Region. The

city of Cape Town as well has done everything possible to support the conference.

As athletic competition drives people to meet at the Olympics, top science will bring people from all over the world to Cape Town to witness a great technical program.

Will Rogers, America's famous cowboy philosopher, once said:

*"A person only learns in two ways – one by reading, and the other by association with smarter people."*

This is a great opportunity to learn from some of world's best scientists. We encourage you to make plans to attend AAPG's ICE in Cape Town.

To preview the meeting and register go to: [www.aapg.org/meetings/international.cfm](http://www.aapg.org/meetings/international.cfm).

\* \* \*

Before Cape Town, however, we have several other important meetings:

✓ The inaugural **GEO India Conference and Exhibition** is scheduled for Sept. 16-19, in Greater Noida, India, just outside of New Delhi (see story, page 42). The conference is sponsored by the Oil and Natural Gas Company of India, AAPG, the Association of Petroleum Geologists, the Society of Petroleum Geophysicists (India) and the Society of Petroleum Well Log Analysts (India).

The exhibition is developed and managed by Arabian Exhibition Management and its partner, Oversea

Exhibition Services.

The conference is an incredible collaboration between professional societies and industry and is a big event in the region. Again, it promises a great technical session combined with some of the best social events anywhere.

Please consider joining us at **GEO India**. For information go to [www.aeminfo.com.bh/geoindia2008](http://www.aeminfo.com.bh/geoindia2008).

✓ Following **GEO India**, the AAPG **European Region** is conducting its annual conference in Oslo, Norway, Oct. 6-7. The focus on this technical program is a look at the North Sea after 40 years of exploration and development.

You can check it out at [www.aapg.org/oslo/](http://www.aapg.org/oslo/).

In the United States there are two major Section meetings this fall – both of which you can get a taste of in this EXPLORER on pages 20 and 24 – the Gulf Coast Association of Geological Societies (GCAGS) in Houston and the Eastern Section meeting in Pittsburgh.

✓ This year's **GCAGS** meeting, set Oct. 5-8, is combined with the Geological Society of America's annual meeting.

This is going to be a very large meeting with great dynamics between academia and industry. It promises a very diverse technical program with a lot to offer to students and the young professional.

For more information go to [www.gcags2008.com](http://www.gcags2008.com).

✓ The **Eastern Section** meeting in Pittsburgh, set Oct. 11-15, is also a joint meeting, with the Pittsburgh Petroleum Section of the Society of Petroleum Engineers.

Pittsburgh is in the heart of the Appalachian shale gas play and this technical program is unique in the manner it focuses on geoscience and engineering. If you are involved in a shale gas play, then this is a meeting you should attend.

The meeting link is [www.aapgspe2008.org](http://www.aapgspe2008.org).

✓ The final AAPG associated meeting of the year is the **International Petroleum Technology Conference (IPTC)** in Kuala Lumpur, Malaysia, Dec. 2-5 – the first collaborative effort in the Asia-Pacific Region between SPE, AAPG, SEG and EAGE.

Look for more on IPTC in future editions of the EXPLORER.

\* \* \*

I am looking forward to another long night at the Olympics. In addition to the big events, I think tonight they may show badminton or maybe fencing. I especially like fencing, except it's just so quick.

I guess I need to watch in slow motion.

## Broad range of topics covered

## DEG Gives Value Beyond Meetings

By REBECCA DODGE  
DEG President

AAPG's Division of Environmental Geosciences had its largest set of offerings in several years at this year's AAPG Annual Convention and Exhibition in San Antonio.

Oral and poster sessions sponsored or co-sponsored by DEG covered hot topics that included CO<sub>2</sub> sequestration, environmental site characterization and remediation, climate change impact on petroleum facilities, as well as an interactive forum on global climate change.

DEG's luncheon speaker, Eric J. Barron, former dean of Texas at Austin's Jackson School of Geosciences, demonstrated at the large gathering how the geoscience community and the extensive geologic record of climate change are important elements in this changing debate on global warming. (Editor's note: The Global Climate Change session presentations are available in video via *Search and Discovery*, AAPG's electronic journal.)

Short courses and field trips covered CO<sub>2</sub> sequestration, near-surface geophysics, site characterization/ground water modeling, geohydrology and field trip safety. These well-attended events testify to the strength of and level of interest in the environmental science element within AAPG.

Planning for the 2009 convention in Denver is well under way and will continue the trend of offering AAPG members the most up-to-date applied environmental science presentations,



Dodge

forums, short courses and field trips.

\* \* \*

So what does DEG do for you, as an AAPG member, the rest of the year?

First, if you are not yet a member of the division you probably are missing the DEG journal published by AAPG, *Environmental Geosciences*.

Coming in September to member mailboxes is Vol. 15, no. 3 of this quarterly gem – Special Issue 2 on the topic of "Constructed Wetland Treatment Systems (CWTS): Renovation of Impaired Waters for Beneficial Use."

Both this and the previously published Special Issue 1 (Vol. 15, no. 1) present the state-of-the art in applied scientific research, design and field testing for CWTSs; case studies are presented that demonstrate the application of specifically designed CWTSs to treating highly impaired waters including storm water, flue-gas desulfurization water from coal-fired power plants and water produced from fossil-energy extraction.

Incidentally, articles contained in these two special issues were presented during the 14<sup>th</sup> annual Hydrogeology Symposium held at Clemson University, South Carolina in March 2006. Clemson professors James W. Castle, an AAPG member, and John H. Rogers Jr. put together the special issues, and note in the introductions to the issues that:

*"Waters from manufacturing, energy production and energy extraction can provide important new supplies if these waters can be treated for re-use. Treatment methods are needed that are technically sound, economically viable and environmentally acceptable (Special Issue 1)."*

*"Constructed wetland treatment systems papers are selected to demonstrate design, construction and use of systems for treating flue-gas desulfurization (FGD) waters from thermoelectric power plants and waters produced from natural gas-storage fields. FGD waters and oil and gas produced waters have tremendous potential to help meet increasing water demand if these waters can be efficiently and effectively treated for re-use (Special Issue 2)."*

\* \* \*

What else have you been missing as a non-member of DEG, your professional link to environmental practitioners on the petroleum industry?

✓ Special volumes on *Environmental Issues of Petroleum Exploration and Production* (Vol. 12, no. 3) and *Characterization of Demonstration Projects of CO<sub>2</sub> Geological Sequestration* (Vol. 13, no. 2 and 3).

✓ Articles on "Forensic Investigations of Refined Product and Crude Oil Releases" (Vol. 12, no. 3).



✓ Three articles involving the use of geostatistical techniques in environmental geosciences (Vol. 13, no. 4).

✓ International contributions,

including "Concentrations of Heavy Metals and Hydrocarbons in Groundwater Near Petrol Stations and Mechanic Workshops in Calabar Metropolis, Southeastern Nigeria" (Vol. 14, no. 1) and "High-Resolution Records of Polycyclic Aromatic Hydrocarbons in the Sediments of Lake Liangzi in Central China During the Last 100 Years" (Vol. 14, no. 3), as well as many others from petroleum environmental geoscientists from Mexico, India, Germany, Australia, the United Kingdom, the Netherlands and Moldova.

Petroleum geoscientists have the opportunity through DEG membership to become or stay current on the hot environmental science topics affecting our industry (as well as a broader range of environmental topics, including natural hazards and geohydrology).

*Environmental Geosciences* connects DEG members within an international network of environmental geoscientists addressing, from an applied perspective, real issues facing our industry.

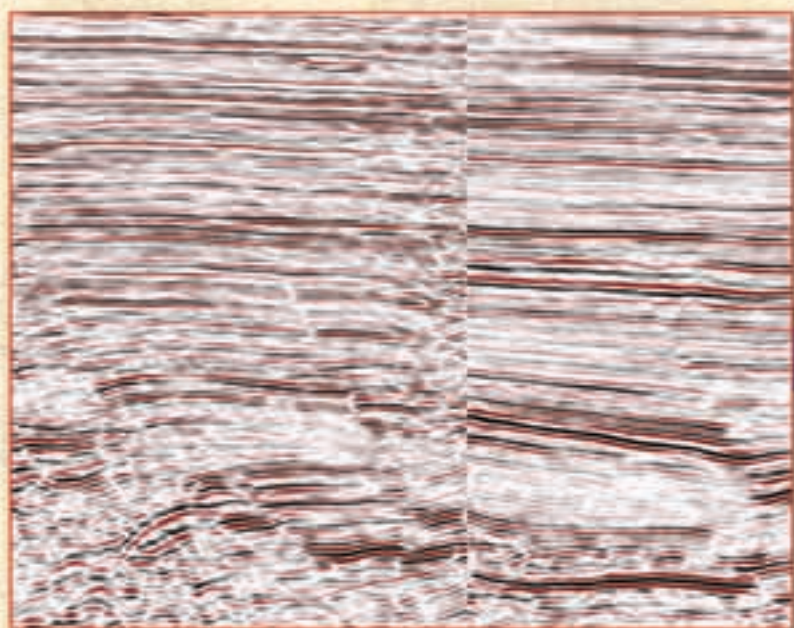
Join the DEG and join the network! □



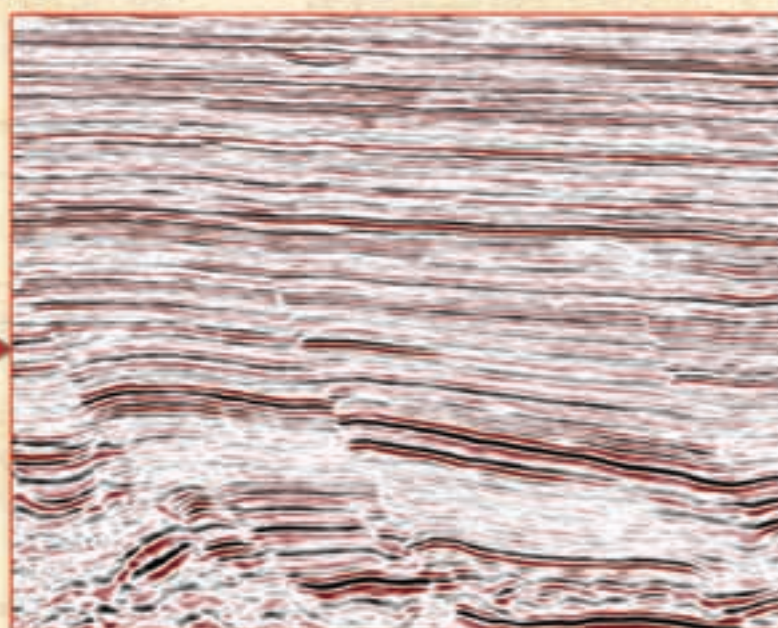
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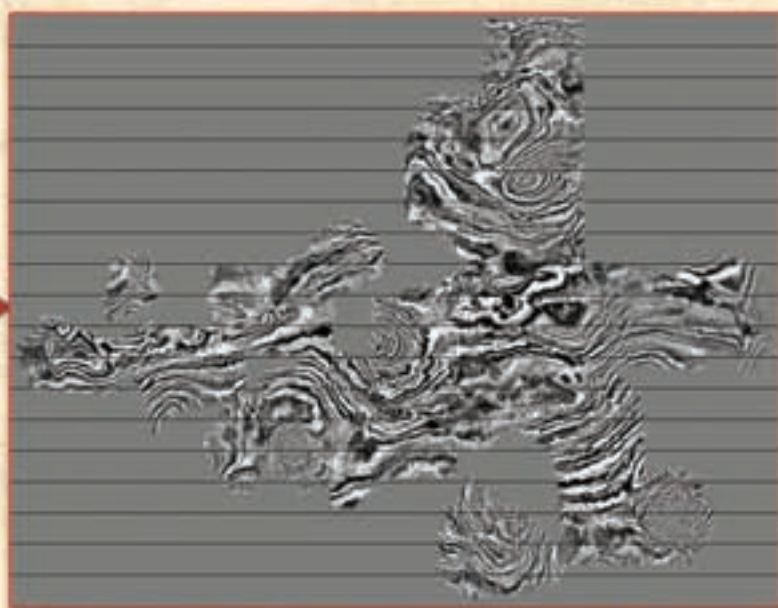
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Data courtesy of **SEITEL DATA**



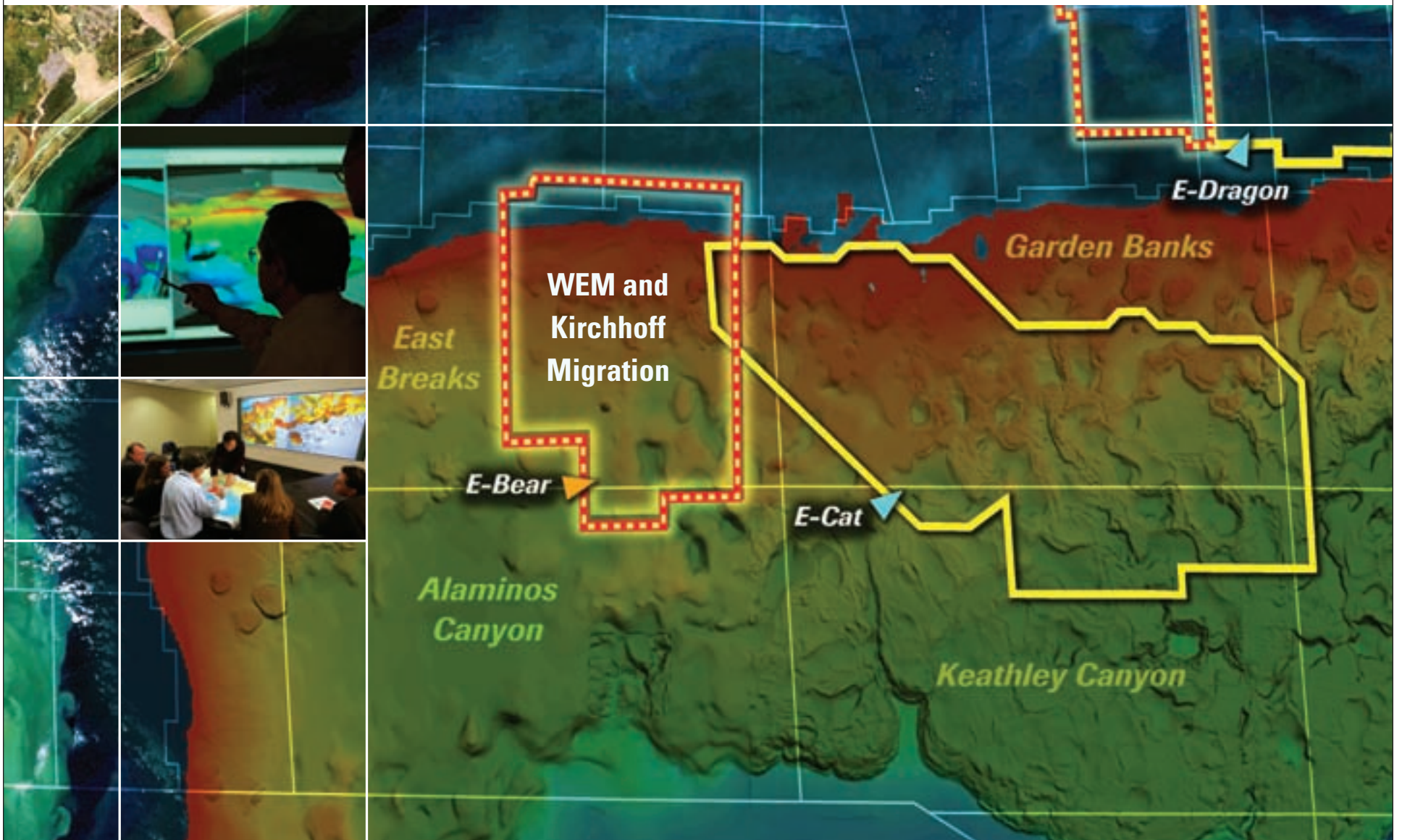
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