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EXPLORER

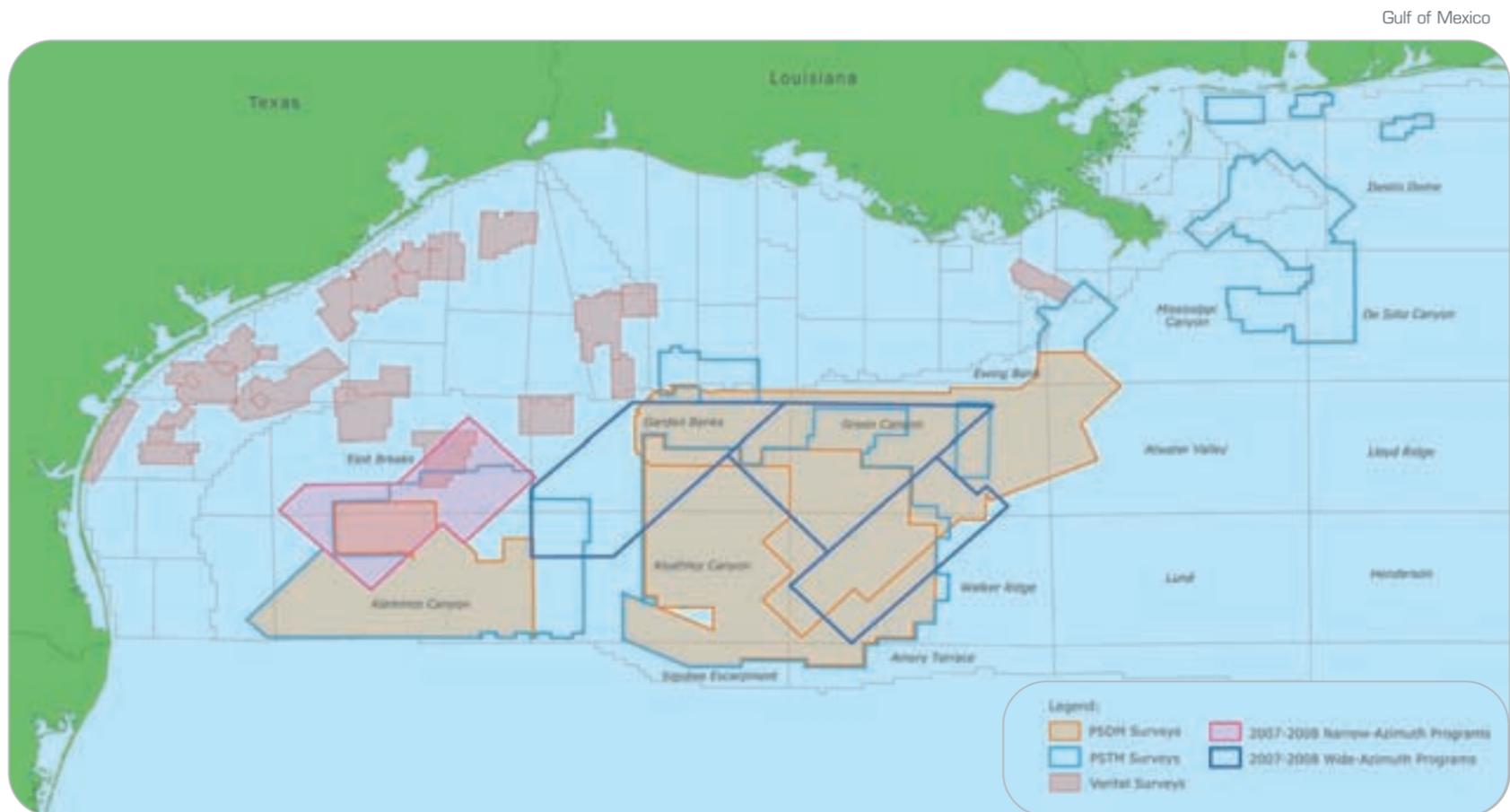
MARCH 2008

Appalachian Spring

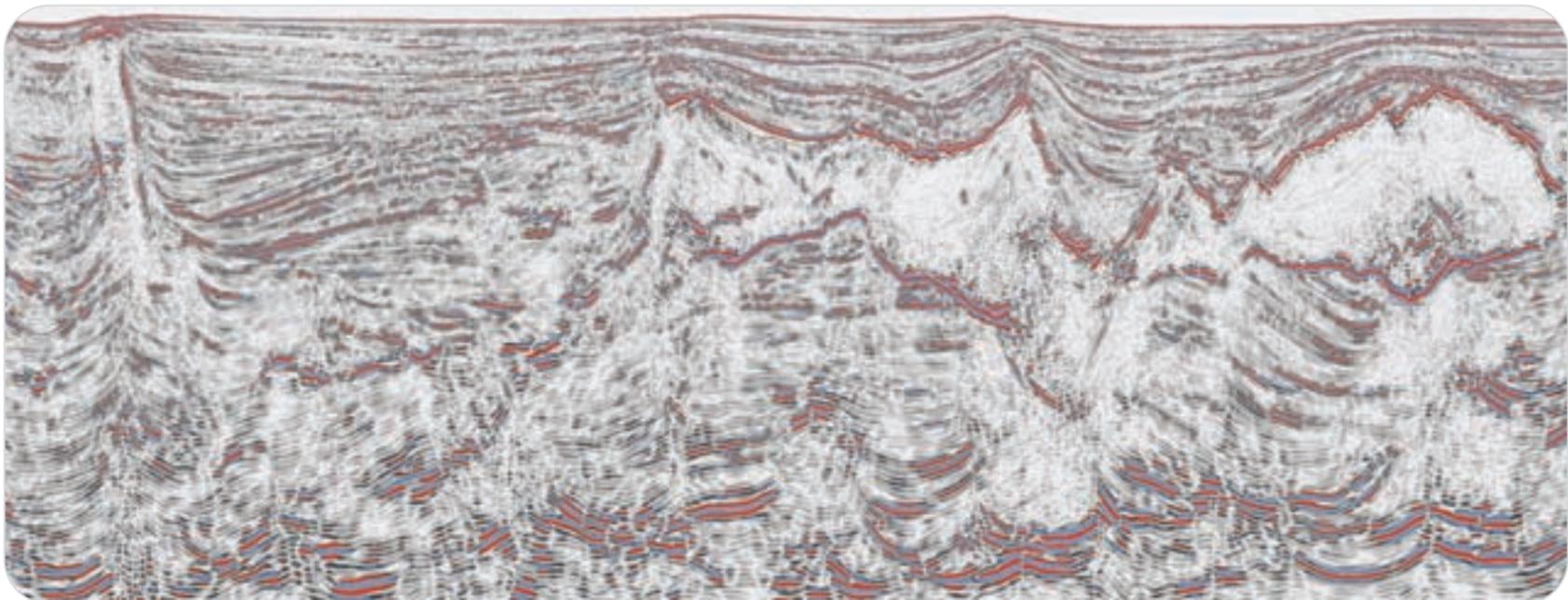
A new shale play
emerges in the East

See page 6





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On the cover: A potentially big play is springing from a surprising and relatively new location in the United States: It's the Marcellus shale gas play, and some geologists believe it has the potential to make the Appalachian Basin a hot spot of activity for years to come. See story on page 6. Shown on the cover is a portion of the heavily jointed Middle Devonian Marcellus Shale at Oatka Creek in the village of LeRoy, N.Y. Photo by Gary Lash.

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PRESIDENT'S column

Rhetoric is Politics; Opportunities are Real

By WILLARD "Will" GREEN

With the U.S. political season now in full swing, some of the candidates are focusing on the idea of the country becoming "energy independent" with such phrases as "America must break the tyranny of oil" or "We can't allow dictators to enslave the American people."

Why are they doing this?

Never mind the facts and statistics. If the rhetoric creates a positive result in the polls, it's OK.

Most Americans don't understand the global energy trade. According to the U.S. Energy Information Administration 70 percent of our total energy supply is produced domestically – mostly from coal and natural gas, the main source of energy for generation of electricity. The reason we are not – and likely never will be – energy independent, is that 60 percent of our oil supply is produced outside the United States.

Canada is the largest supplier, followed by Mexico.

Even though newly enacted conservation measures signed into law in December 2007 will somewhat reduce demand in the United States, the growing need for energy in developing economies worldwide will most likely cause an increase in consumption in future years.

Where is the peak of world oil production? Depends on whose curve you view. I have seen curves that peak from 2010 to 2047. Generally, the more recent graphs show a more distant peak.

Could this be due to ever advancing technology and significant new international discoveries (as reported in the January 2007 EXPLORER)?

Bottom line: This is a great opportunity for new geosciences graduates to enter the petroleum industry!

PTTC Moves Ahead

AAPG is moving ahead with managing the operations of the Petroleum Technology Transfer Council.



Green

The regional lead organizations in six U.S. regions have plans to offer 26 workshops this year. These workshops will cover a wide variety of geological and engineering topics.

We anticipate that some of the workshops may be

offered in our AAPG international Regions.

On January 22, Rick Fritz, Jim Blankenship, Lance Cole and I met with Society of Petroleum Engineers' staff in Dallas to explain in detail our offer to bring SPE into the program as a member of the corporation. The workshop schedule seems like a natural fit for both AAPG and SPE members.

The SPE Board will consider our proposal in late March.

APPEX

As this issue of the EXPLORER is delivered I will be en route to London for AAPG's Prospect and Property Expo, which will be held March 5-7.

This expo will include sessions on Russia, Asia and Australasia, Africa and the Middle East, Europe and the Arctic region and South and Central America and the Caribbean, as well as exhibitor presentations on specific farmouts and prospects.

APPEX also includes technical sessions; in fact, one could say that APPEX is the NAPE of the world outside of North America.

I'm certainly looking forward to the Expo, as well as my visit to Aberdeen to meet with an exploration group and students at the University of Aberdeen.

Cheers!

Will Green

Online Voting Begins for AAPG Slate

Balloting for AAPG officers will be available online starting March 4 through May 15 noon CDT.

This year members will be choosing a president-elect from three candidates (you will be asked to vote in order of your preference); a vice president-Sections from two candidates; and a treasurer from two candidates.

AAPG will mail a paper ballot only to those members who do NOT have a valid e-mail address, or to those whose e-mail addresses are bounced back as non-deliverable.

To cast your vote you will need both your AAPG member number and an assigned code, referred to as an "E-Signature." Both these numbers will be provided to you either in your e-mail notification or on the paper ballot, and can be used only one time.

You will be able to access the e-ballot by clicking on the AAPG Officer Election icon at www.aapg.org.

The candidate slate is:

President-Elect

John C. Lorenz, Geoflight LLC, Edgewood, N.M.

Dwight M. "Clint" Moore, DiamondStar Exploration & Production, Houston (petition candidate).

Ronald A. Nelson, Broken N Consulting, Cat Spring, Texas.

Vice President-Sections

David H. Hawk, Energy Analysis and Answers/Consultant, Boise, Idaho.

W.C. "Rusty" Riese, BP Americas, Katy, Texas.

Treasurer

Edith C. Allison, U.S. Department of Energy, Washington, D.C.

Kay L. Pitts, Aera Energy LLC, Bakersfield, Calif.

Candidate biographies and statements are available at www.aapg.org/business/candidates/.

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Appalachian Basin's Marcellus – the new target

Another Shale Making Seismic Waves

By LOUISE S. DURHAM
EXPLORER Correspondent

If you feel bad because you failed to lay claim to a piece of the action early on in the high-flying Barnett Shale play in Texas, stop living in the past.

There's a whole new shale play kicking off in the northeastern part of the United States that has industry analysts, operators and others all abuzz.

Some folks say eventually it might overshadow the Barnett in productivity.

It's the Marcellus shale member of the Devonian black shales, and it spans a distance of approximately 600 miles, trending northeastward from West Virginia all the way into New York.

By comparison, the Barnett has a linear extent totaling about 120 miles.

"This is an unconventional play with a huge area to it," said

AAPG member and current Distinguished Lecturer Terry Engelder, a Pennsylvania State University geosciences professor who has studied the Devonian black shales in the Appalachian Basin for 30 years.



Engelder

"It's the size of this shale that's continuous that makes this a very unique resource in terms of potential," he said.

In fact, the play likely will increase the Potential Gas Committee's probable resource numbers by 50 TCF, according to Engelder.

"Probable resources are associated with known fields and are the most assured of potential supplies," he noted. "This is not a proven reserve, but when you compare it to American proved reserves of 200 TCF, this is 25 percent.

"Compared to technically recoverable reserves, it's still 10 percent."

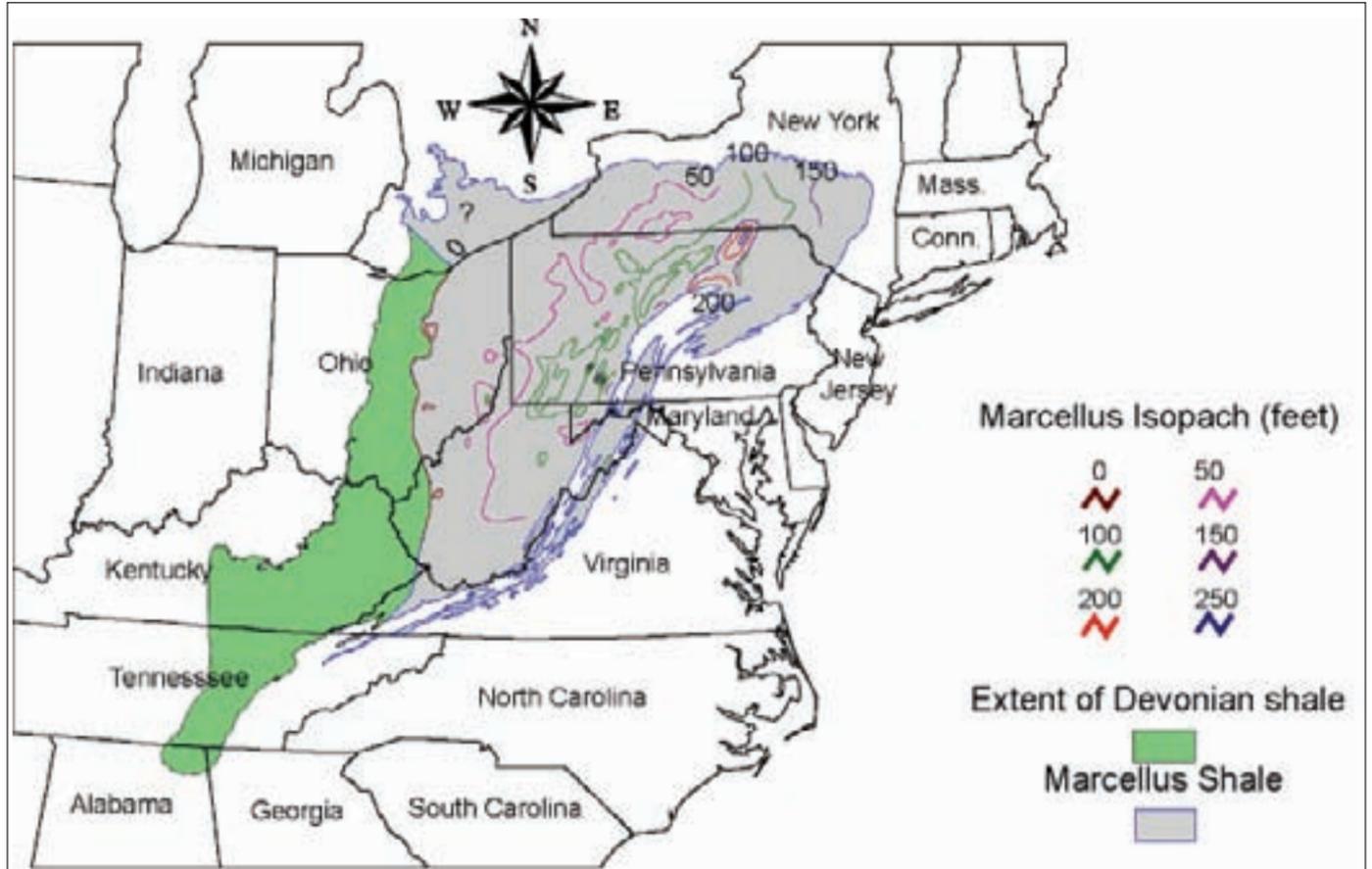
Hot Off the Press

If this is all news to you, you're not alone.

It was a December press release listing results from a pilot horizontal well program implemented by veteran Marcellus player Range Resources that put a spotlight on this shale's significant productive potential.

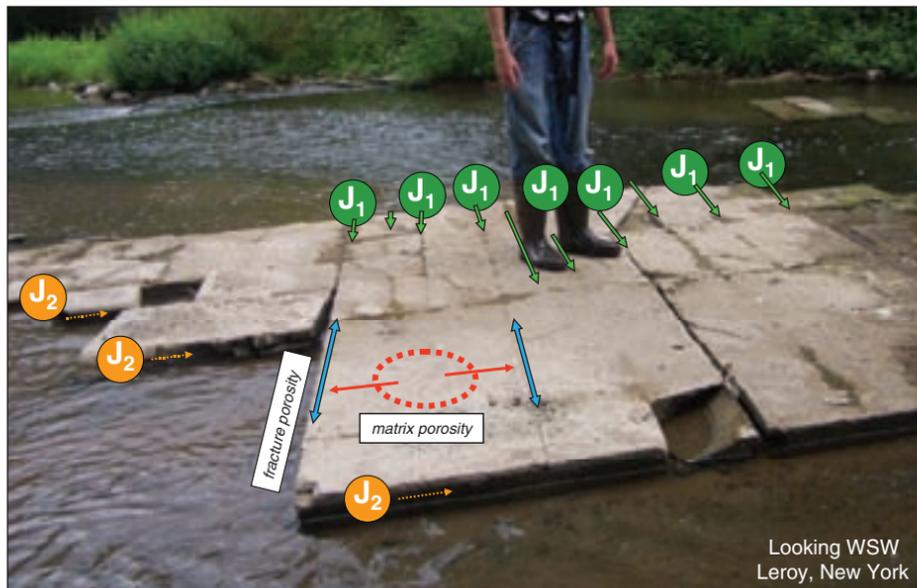
The company reported initial test rates between 1.4 and 4.7 Mcf/d for five horizontal wells it drilled to the Marcellus in Pennsylvania, capturing the attention of a host of folks, including financial analysts and media-types.

"You always got a good gas kick



Graphic courtesy of Milici (2005)

Distribution of Marcellus shale in the Appalachian Basin – a play that has industry analysts, operators and observers all abuzz.



Looking WSW
Leroy, New York

Photo courtesy of Gary Lash

The Marcellus is a fractured reservoir that may hold huge potential in the eastern United States; note that J₁ is more the common fracture and should be the target of production.

drilling through the Marcellus, but no one could ever complete it and make it productive," said Rodney Waller, senior vice president and chief compliance officer at Range. "This was over a 10 to 15-year period.

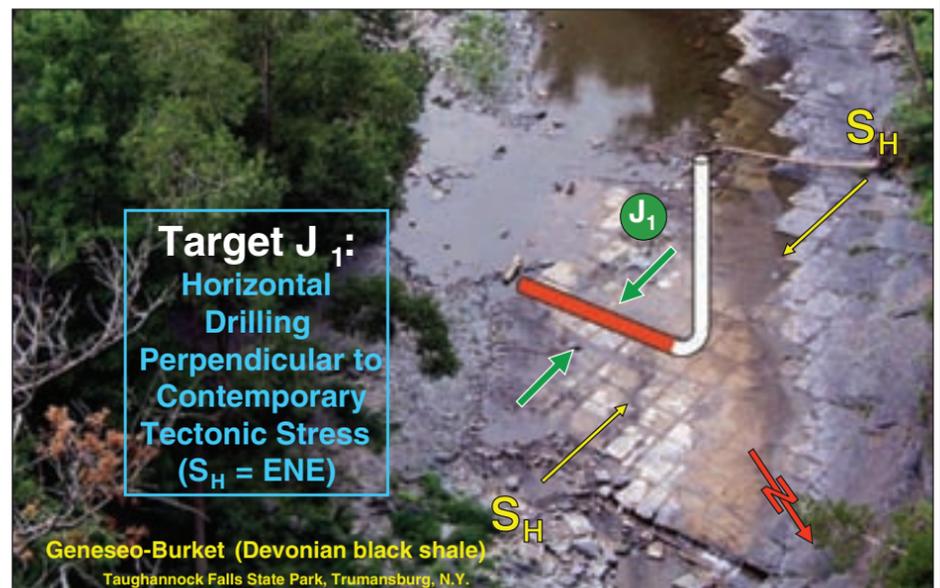
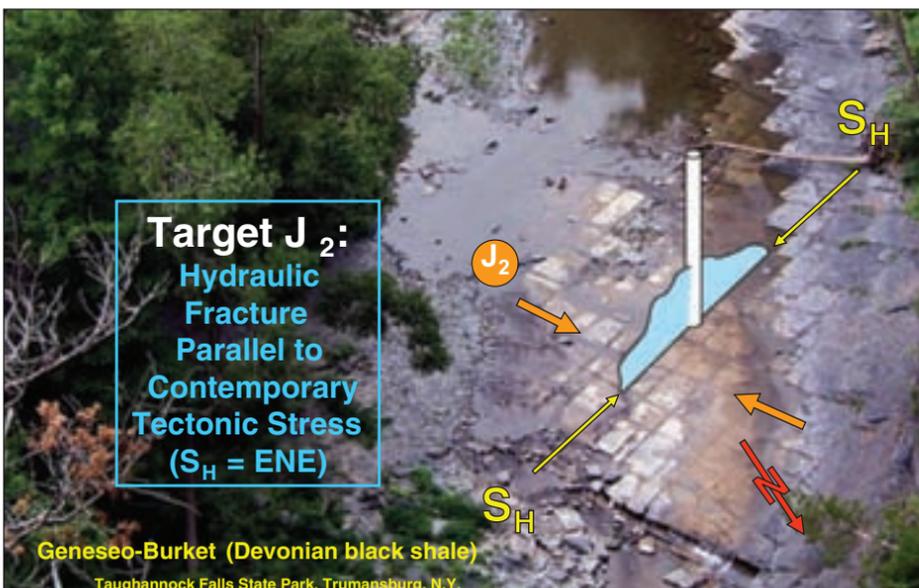
"Almost three years ago, we brought a slick water frac out of the Barnett-type of completion and did that on a vertical well and got a good initial rate, good production curve, et cetera, which gave us encouragement to move forward."

Following a couple of other verticals, the company drilled a horizontal well, which didn't perform competently yet showed inclining rather than declining production after several months.

"It told us, hey, there may be gas here, but the way in which you completed the well is probably not the optimum way," Waller said. "There's a very large section there – and like in the Barnett just as everywhere, where you put the horizontal, how you put it in, how you lay it in is very critically important."

Waller noted there wasn't excessive

See **Marcellus**, page 8



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Marcellus

from page 6

interest in the Marcellus until maybe 12 months ago.

"It was Range and maybe one other company looking at it," he said. "This thing started getting legs under it after we started announcing bigger wells."

Going Horizontal

It's all about the fractures in the rock – and how you tap into them.

"The Marcellus has two sets of vertical fractures, or joints - the J₁ and the J₂," said Engelder, who authored a paper in 1985 predicting that the Appalachian Basin could contain a well-developed set of natural hydraulic fractures. "Later, natural hydraulic fracturing in the basin was confirmed in a series of papers by myself and co-authors.

"In the Marcellus, the east-northeast trending J₁s are more dense, more closely spaced and are cross-cut by the less well-developed, northwest-trending J₂ joints," Engelder noted.

"Operators can drill horizontal wells to the north-northwest, or south-southeast and cross and drain a whole bunch of the densely developed J₁s," he said, "which, because they are so planar, may be difficult to detect using conventional borehole imaging techniques.

"As explained in my 2006 GEOLOGY paper, the J₁ joints are oriented the same throughout the basin, which is key to success of the play.

"Still another key is that this is a dual porosity reservoir," Engelder said, "where the fractures will be drained rapidly and the matrix will be drained more slowly.

"It's the matrix that really carries a lot

of the gas – both free gas and adsorbed gas," he noted. "The key is to connect the matrix porosity to the wellbore, and it's the density of the J₁ fractures that allows this connection to be the most effective and why the Marcellus is really going to work as a horizontal play."

Different Strokes for Different Folks

Other Devonian shale reservoirs, such as the Huron, are present in the region, but the deeper Marcellus is higher pressured with more gas-in-place, according to Waller, particularly in Pennsylvania where the Marcellus is the dominant Devonian shale member.

Pinning down specific targets in the play is no easy task.

"We're seeing different applications in different places, and we think the Marcellus will be prospective on a multiple play basis just as in the Barnett," Waller said. "There are wet gas areas, dry gas areas, more geologically complex areas.

"You have all those types of areas that could be prospective," Waller said, "so everyone is trying to home in on one specific area – but there are going to be multiple areas that are prospective.

"There's a whole variety, and there are players who have drilled both horizontal and vertical wells in the Marcellus that are very good."

In fact, Atlas Energy Resources reported in November that it had completed 10 vertical wells as commercial producers out of 13 verticals drilled. The remaining three wells were on schedule to be fractured and completed.

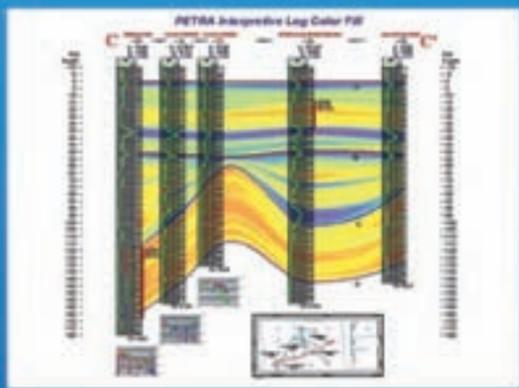
The wells are in southwestern Pennsylvania where the Marcellus is approximately 8,000 feet deep.

See **Shale**, page 10



Photos courtesy of Range Resources (above), Gary Lash

Evidence of the Marcellus shale can be found in the eastern U.S. drilling activity (above) that already is taking place in the Appalachian Basin, and along the shores of Lake Erie (below) south of Buffalo, N.Y.



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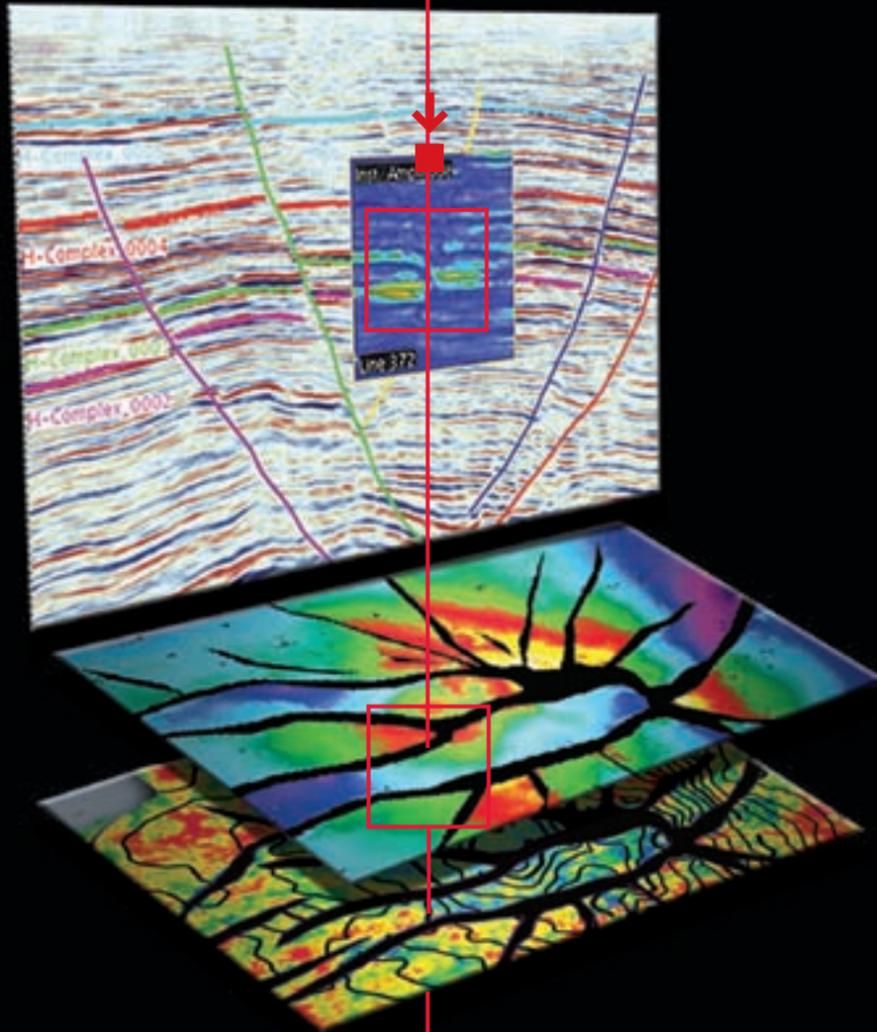
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Shale

from page 8

Mum's the Word

Not surprisingly, there's intense competition for acreage in this play – meaning most companies are close-mouthed and trying to maneuver under the radar.

A lack of available public information makes this effort even more challenging. "In Pennsylvania, there's no regular log repository, and that's one of the barriers to entry," Waller said. "You have to have published papers, regional stuff, unless you've actually traded logs."

After acquiring the leases, boning up on the vagaries of the fractured Marcellus and coming up with a drilling strategy, the players may have to wait in line to drill a well.

"There are currently only four, maybe six rigs in Appalachia that can drill horizontal wells," Waller said, "and we have two or three of them."

"There's also a scarcity of pump services, coil tubing, drilling equipment because most of the equipment in Appalachia is geared toward shallow drilling, gas supplies for utilities, et cetera."

Throwing a Dart

Because the play kicked off on such a large scale geographically, operators will have to burn more midnight oil than usual to pinpoint a niche area.

"If you look at shale plays like the Barnett, Woodford, Fayetteville, they all started in a very finite, small area and expanded out," Waller noted. "This is the first where the thing is happening over a



Photo courtesy of Range Resources

Technology and "understanding the shale" are the keys to success in the Appalachian.

15- to 20-county area.

"It's scattered through Pennsylvania because everyone has a little bit different interpretation as to where the most prospective shale may be in view of their

past experience with other shales."

Being four years into the play, Range enjoyed the luxury of applying a strategy different from the many new folks trying to establish a foothold in the play.

"We've been in the play long enough, we decided the key is to get a large amount of acreage throughout all prospective areas," Waller noted. "That way no matter how quickly the play develops and the success people have, we have 10,000 or maybe 30,000 acres somewhere close to anything else that may be developed."

For those operators who drilled vertical wells through the Marcellus over the years and experienced nothing more from the usual gas kick, opportunity appears to be knocking.

Indeed, it's time to hone knowledge about this cracked rock and perhaps re-enter those verticals to apply different completion technology or take them horizontal with the goal of tapping into a cluster of fractures.

"Technology and understanding this shale are going to be the key components as to how to drill wells," Waller said, "and how good the productivity is." □

Engelder, Four Other DLs Set March Tours

Some who would like to get more information from Terry Engelder on the Marcellus shale play will have a chance to personally ask questions this month during his AAPG Distinguished Lecture Tour.

Engelder is one of five Distinguished Lecturers who will be on tour in mid- and late March. He is offering two talks, "Acadian-Alleghanian Orogenesis as Revealed by Fracturing Within the Appalachian Foreland," and "Craquelure in Masterpieces of the Louvre (Paris, France) as Analogue Models for Development of Joints in Fractured Reservoirs."

His schedule includes:

- ✓ March 25 – Calgary, Canada (Canadian Society of Petroleum Geologists).
- ✓ March 26 – Colorado State University, Fort Collins, Colo.
- ✓ March 28 – Four Corners Geological Society.
- ✓ March 31 – University of Oklahoma, Norman, Okla.
- ✓ April 1 – Tulsa Geological Society.
- ✓ April 3 – Northern Arizona Geological Society.
- ✓ April 4 – Southern Methodist University, Dallas.

Other DLs touring during the middle

and end of the month include:

- Peter Skelton, this year's Allen P. Bennison speaker, will tour eastern North America on March 17-28.
 - Garry Karner, this year's J. Ben Carsey speaker, will tour western North America March 31-April 11.
 - Peter McCabe, this year's Roy M. Huffington speaker, will tour Asia and the Pacific region March 17-28.
 - Jose Luis Massaferrero will speak in Bogota, Colombia on March 25-26.
- For details on all of these talks go to the AAPG Web site at www.aapg.org. □



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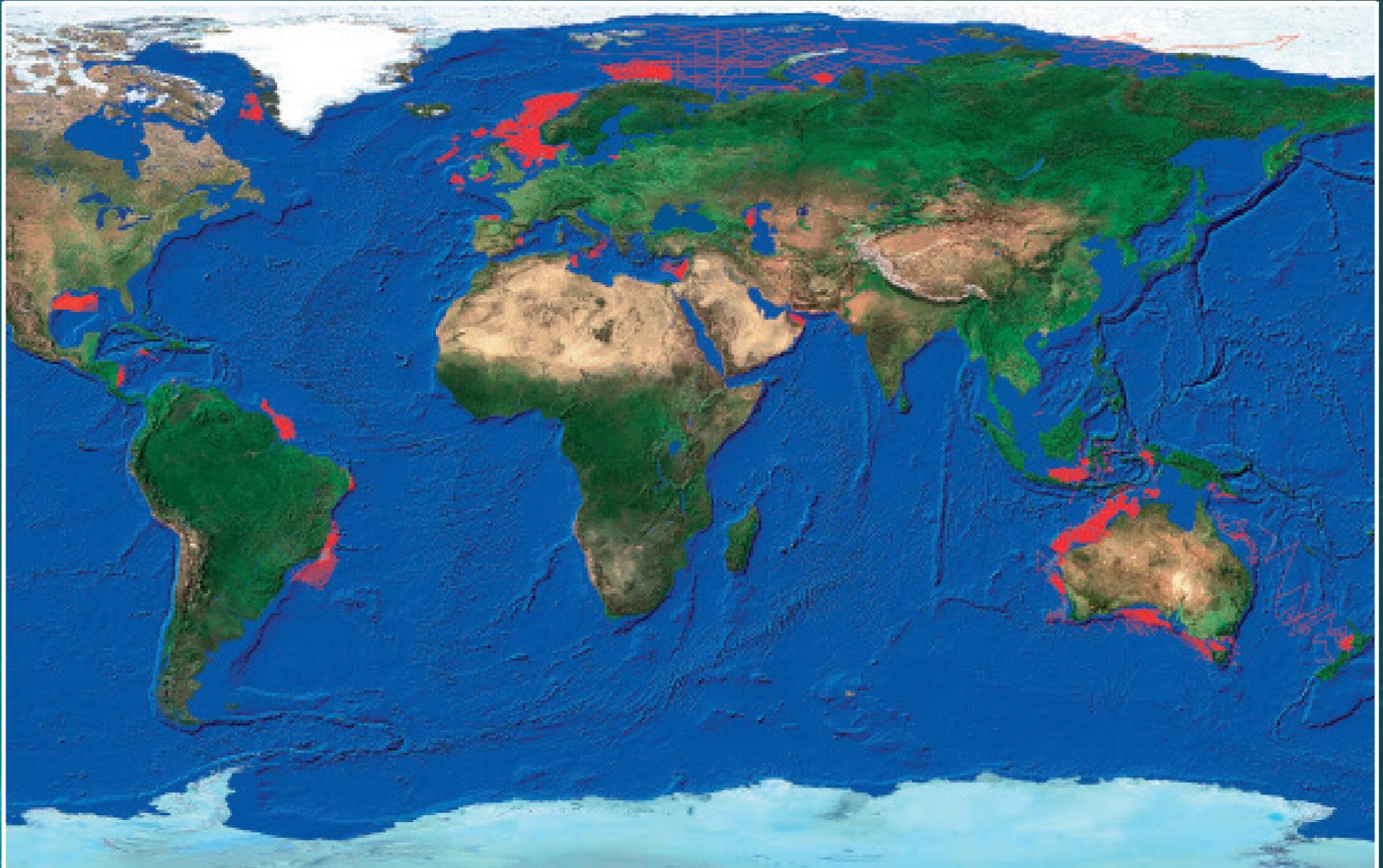
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Competition to ramp up**Busy Cycle Entering New Phase**

By LOUISE S. DURHAM
EXPLORER Correspondent

Don't look for seismic crew members to be scrambling to find work anytime soon.

Indeed, the future for the entire oil field services sector is looking mighty bright.

"I believe the oil field services cycle we're in – which includes everything – is a long cycle," said Bob Peebler, president and CEO at ION (nee I/O). "We're well into the cycle, but I won't be surprised to see it last well into the next decade, if not further."



Peebler

Supporting this line of thought is the premise that the demand for oil and gas will continue to increase during that period, driven mainly by developing countries.

"The only offset I can see is a clear move over time with higher prices due to conservation," Peebler said. "The 'green' movement reinforces that, but we need that."

"We need all we can muster to deal with the combination of the decline curve of reserves and the increase in demand from developing countries," he noted. "It looks like we'll likely be struggling for some time to try to keep up with demand."

The Impact of NOCs

The national oil companies (NOCs) play a key role in expected continuing demand in many countries.

China, for instance, has appeared to be sensitive not so much to prices as to its own energy needs. The country is a net importer of energy and also has its own domestic issues of pollution. This means it's keen on having more cleaner-burning natural gas, in addition to securing energy supplies for its economy.

"Countries like China are not so much worried about quarter-by-quarter stock prices," Peebler said, "they're worried about country energy supply – and since their oil companies are NOCs and even their contractors, they're pretty much driven by this agenda versus short-term price swings."

"That's the case for many of the NOCs, and I think we'll see the NOCs driving the universe a lot more than the IOCs (independent oil companies)."

Peebler views the current lengthy oilfield services cycle as being a two-phase scenario.

He noted we're close to the end of the first phase, which is characterized by a kick-up in activity, which drives demand and ultimately leads to shortages and huge price appreciation.

As a result, the folks in the supply boat business, cementing, drilling and even the seismic vessel business have seen considerable revenue and earnings increases.

"We're sort of coming to the end of this part of the cycle," Peebler said, "because now it's been long enough, you have capacity coming into the market."

In the geophysics arena, this likely will show up in selective markets:

✓ **Land** – There's been a problem getting enough capacity in the land seismic business, but activity has been slowing, and that likely will put a bit of pressure on margins.

✓ **Marine** – Higher-end seismic vessels are still in great demand, with a backlog likely lasting to perhaps 2011. Then a lot of capacity will come in, putting pressure on that segment of the market.

Cycle Two: Technology's Value

As the first phase of the cycle winds down, there's a tendency to begin looking more to technology. This, in fact, becomes the second phase of the cycle, enabling the companies to make money



and continue to grow.

"You can compete on the basis of technology differences and continue to hold your market position," Peebler said. "You can use the technology to improve productivity by better imaging, fewer dry holes, faster drilling."

"Whichever sector of the oilfield services it is, the guys who bring significant improvements in productivity can continue to grow and expand even if part of the market is starting to soften up."

continued on next page

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	Seismic February 1, 2008			Working Month Year Ago	
	Work	Avail	Total	Ago	Ago
West Coast Region	1	1	2	0	2
Alaska	0	1	1	0	1
Rockies Region	9	1	10	5	8
Mid-Continent	26	1	27	26	17
Southwest Region	12	0	12	10	11
Gulf Coast Region	7	0	7	11	10
Ark-La-Tex	2	0	2	4	5
Southeastern Region	0	0	0	0	0
Michigan Basin	1	0	1	1	1
Appalachian Basin/Northeast	3	0	3	3	0
Offshore	15	0	15	15	8
Totals	76	4	80	75	63

Data courtesy of World Geophysical News and IHS

World Region Crew Counts*

	Seismic February 1, 2008			Working Month Year Ago	
	Work	Avail	Total	Ago	Ago
Africa	58	5	63	58	48
Canada	26	13	39	17	19
CIS	42	7	49	41	40
Europe	21	19	40	21	11
Far East	42	15	57	42	35
Middle East	17	11	28	15	17
Latin America	30	8	38	29	24
United States	76	4	80	75	63
Totals	312	82	394	298	257

* Counts for the CIS are based on partial data. There are an estimated 340 crews currently working in the CIS. Far East counts include only partial data for China and India.



continued from previous page

A good example is the birth and ensuing growth of 3-D seismic, beginning in the 1980s when oil prices had tanked. New companies came into the market, and the role of geophysics expanded as it became increasingly valuable to the oil companies because it made them so much more productive.

"At the end of the first phase of the cycle, it's sort of 'game over' for the easy business, and everyone has to work harder," Peebler said. "But you can still make money and grow your business."

"Right now, the sector goes up or down as a whole, but I think we'll see breakouts of companies," he noted. "It will become obvious who has the advantage, so we're getting out of the 'all boats rise' phase."

"The oil companies will start putting more demands on quality, reliability (and) performance, because they will be more in the driver's seat again."

"If you look at the marine business, there are the very high-end things like wide azimuth surveys that take special boats and complicated operations and are very expensive," Peebler said. "But that end of the market appears strong."

"As long as it works and creates value for the oil companies – even if they choke a little on the price – they'll continue to pay it. That kind of market will continue to grow and expand."

Reasons for Optimism

The towed streamer market has its own story.

"I think everybody gets a little fuzzy out there around 2010 to 2012," Peebler said, "mainly because there's enough capacity coming into the streamer business that people aren't certain what demand will be versus capacity."

"There are still a lot of older vessels out there, and if times turn tough I'm guessing they'll start to retire the older fleet," he noted. "You could see a different kind of consolidation if people basically lay off the older fleet and continue to move up the value chain."

On the land side of the business, the picture looks downright rosy.

Many regions are opening up, and people need technology, Peebler noted, citing three specific examples:

- ✓ Libya, which is almost new because it's been off limits for a decade or so.

- ✓ China, which has some very complicated reservoirs and is under pressure to increase domestic production.

- ✓ Russia, which has so much virgin frontier and such a large area that was

See **Crew Counts**, next page

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State Crew Counts

	Seismic February 1, 2008			Working	
	Work	Avail	Total	Month Ago	Year Ago
Alaska	0	1	1	0	1
Arkansas - North	4	0	4	3	3
California	1	1	2	0	2
Colorado	1	0	1	0	1
Gulf of Mexico	15	0	15	15	8
Kansas	12	0	12	13	6
Louisiana - South	0	0	0	2	3
Michigan	1	0	1	1	1
Mississippi	0	0	0	0	0
Montana	2	0	2	2	1
Nebraska - West	2	0	2	0	1
Nevada	0	0	0	1	0
New Mexico - Southeast	1	0	1	1	0
New York	1	0	1	1	0
North Dakota	3	1	4	0	1
Oklahoma	10	1	11	10	6
Pennsylvania	1	0	1	1	0
Texas - East	2	0	2	4	5
Texas - West	11	0	11	9	11
Texas Gulf Coast	7	0	7	9	7
Texas Panhandle	0	0	0	0	2
Utah	1	0	1	1	1
West Virginia	1	0	1	1	0
Wyoming	0	0	0	1	3
Totals	76	4	80	75	63

Crew Counts

from previous page

shot in the past with fairly old technology.

"I think the land business in the international arena will continue to grow nicely and really have a demand for improvement in technology," Peebler said, "because a lot of places people are trying to shoot are very complicated. We think it will be a healthy business, and we'll see a lot of technology continue to flow into it."

The industry appears to be at the beginning of a third cycle of technology on land – a bit like the former movement from 2-D to 3-D – and the companies are starting to re-tool for that.

"This brings in the need for new processing technology, training people, new technology infrastructure," Peebler noted. "I think we'll see several years – maybe a decade or two – of very strong growth in land geophysics."

The Wait

Geophysics, however, is not just about seismic.

Indeed, there are new measurements coming into play under the whole big umbrella of geophysics.

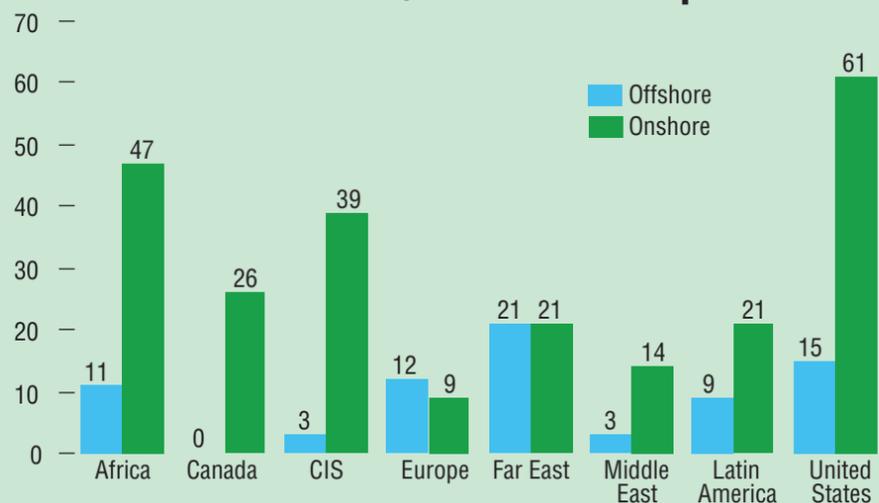
These include electro-magnetic technology, or EM, which has rapidly become a buzzword among many data gatherers. Despite the buzz, those who play the EM game are realizing it's a mighty complex technology that may take longer to create real value than originally thought.

"There's been a lot of hype around EM at the start," Peebler said, "and I think reality is setting in and people realize it has great applications, but there's a lot of work to do to really get the value out of it."

"I think it will be a fairly long slog for that business to grow, but it's another important technology that's got a lot of life in it."

"It's just going to take longer than people thought for it to become a major piece of the action." □

Global Onshore/Offshore Comparison*

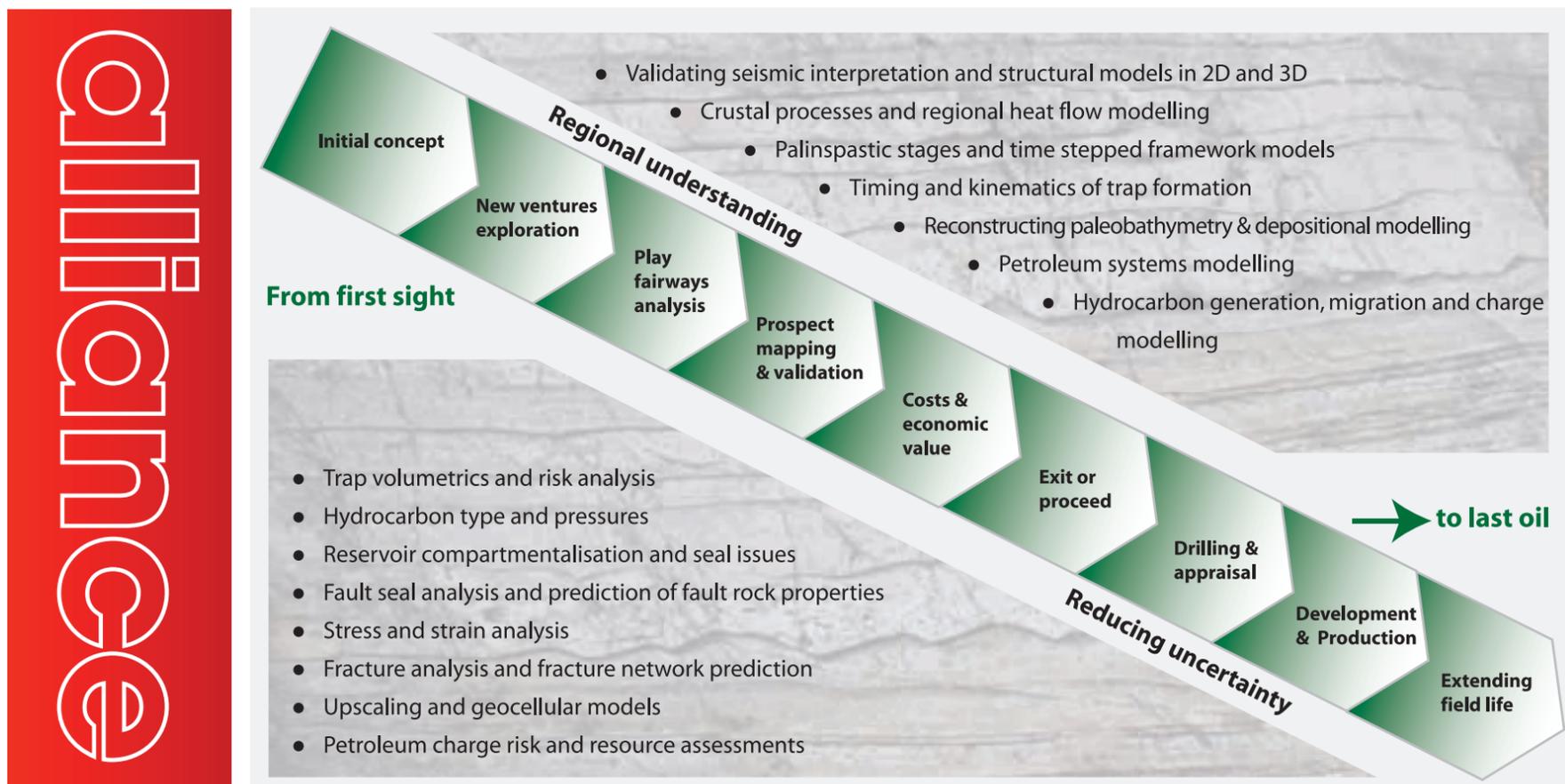


* Counts for the CIS are based on partial data. There are an estimated 340 crews currently working in the CIS. Far East counts include only partial data for China and India.

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The Alliance is proud to be associated with the Virtual Seismic Atlas, launching at the AAPG San Antonio exhibition.

Wide azimuths combat salt 'blur'**Resolution Undergoing Revolution**

By DAVID BROWN

EXPLORER Correspondent

You usually hear a lot about revolutions.

So it's a little strange that we haven't heard more about the revolution taking place in the Gulf of Mexico.

Especially since this revolution will spread around the world to other basins with salt, and exploration geologists will have to know as much about it as possible.

The development of seismic work in the Gulf is going in every direction right now – on purpose. It's a sea change brought about by necessity.

Faced with deepwater drilling costs that can reach \$100 million per well, exploration teams are demanding the very best imaging possible for subsalt prospects.

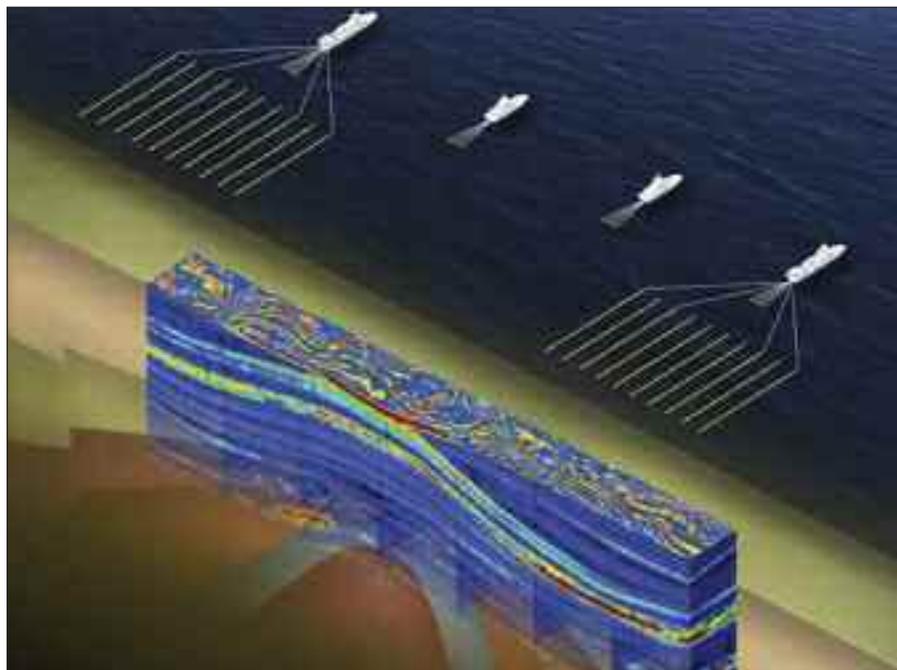
In response, seismic acquisition has expanded to capture data over a wider swath of water, and to gather perspective from a number of different directions.

That's producing a new, sharper look at prospects below the Gulf salt.

Call it a revolution in resolution.

Offshore, the angle of linear horizontal direction is known as "azimuth" – and until recently, seismic shoots typically took place with a vessel towing streamers along one azimuth.

This approach has some serious limitations. The line of data captured will be limited to the width covered by the streamer spread, maybe a kilometer at most.



Graphic courtesy of WesternGeco

WesternGeco's four-vessel approach to wide-azimuth seismic utilizes two recording vessels towing streamers with sources plus two source-only vessels. The distance between each vessel is 1,200 meters, and the crossline offset from the source of the first recording vessel to the farthest streamer on recording vessel two is 4,200 meters.

And the sound or energy source will be on the same vessel, also limiting the width of capture.

At the same time, this narrow-azimuth seismic acquisition tackles the area of interest from only one direction, like seeing a three-dimensional object with one eye and without being able to move around.



Summers

"In the Gulf of Mexico, we realized we couldn't image below these complex salt overburdens with our narrow-azimuth seismic to meet our field development and exploration challenges,"



said Tim Summers, advanced imaging technology director for BP in Houston.

The Need to Go Wide

Confronted by the challenge of evaluating subsalt Gulf prospects in the 1990s, the industry had developed innovative approaches to seismic acquisition and processing.

Techniques like prestack depth migration for large 3-D surveys helped overcome the blurring effect of salt layers.

"It's just like optics," Summers noted. "If you've got a table with a top of beveled glass and you've got an object under the glass, the glass distorts the image. That's all the salt is doing – it's distorting the seismic image of the reservoir."

But improvements through reprocessing and refinement began to hit a limit. BP then reached for more data by acquiring two or more

See **Azimuth**, page 18

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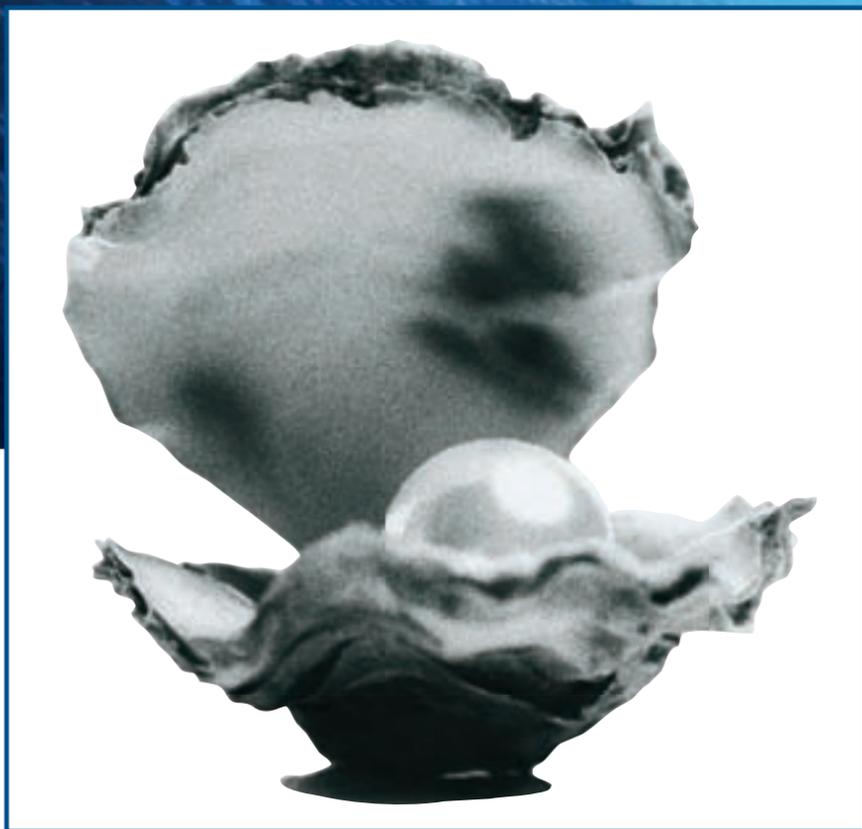
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azimuths of seismic over several prospects.

"We were shooting dual-azimuth in the early to mid-'90s. We got evidence we needed more azimuths as early as that and further increased the number of azimuths on some fields," Summers said.

"This led to the recognition of need for wide-azimuth, and by 2003 we had developed the techniques that enabled us to go do it," he added.

In the 2004-06 period, the company carried out two large deepwater field trials in the Gulf of Mexico, using wide-azimuth towed streamer over its Mad Dog field and ocean-bottom nodes over the Atlantis field.

Each of these was an industry-first, at-scale field trial of wide-azimuth seismic for sub-salt imaging.

Since then, the Gulf of Mexico has become both a hotbed of experimentation and a proving ground for multiple-azimuth, wide-azimuth and complex-azimuth or rich-azimuth seismic surveys.

Differences That Matter

It's important to distinguish among those approaches.

"Multiple-azimuth is when we acquire narrow-azimuth conventional surveys, but in multiple directions," said AAPG member Jerry Kapoor, newly named manager of the WesternGeco's Subsalt Center of Excellence in Houston.

Kapoor previously was the North American advanced imaging group manager for WesternGeco.

Dual-azimuth combines acquisition in two directions, multi-azimuth in three to six directions, he said.

By contrast, "wide-azimuth is where you're acquiring a wider swath of data at the same time using several vessels. Currently, we use four vessels," Kapoor explained.

"Rich azimuth is when you do a combination of multi-azimuth and wide-azimuth. You acquire wide-azimuth, but in multiple directions," he said.

Multiple-azimuth acquisition requires only one vessel.

Wide-azimuth seismic can employ three or four vessels. At Mad Dog, BP has used two separate source vessels in addition to the streamer-towing vessel.

The source vessels were at the leading and trailing edges of the array and offset along the cross-line direction for multiple boat passes.

In WesternGeco's four-vessel arrangement, two vessels tow streamers in conjunction with two other source vessels.

At the highest end of acquisition, multiple vessels capture wide-azimuth seismic in multiple directions.

This is not cheap – but it is worthwhile and high-value when surveys lead to sizable discoveries, increased output and longer reservoir life.

Kapoor said wide-azimuth acquisition may be three times as expensive as a narrow-azimuth survey. Width of the line, which can exceed four kilometers, is also a factor.

"The wider you go, the more expensive it gets," he said.

Combining wide-azimuth and multi-azimuth might involve multiple times the cost, although some efficiencies exist.

"Better productivity in acquiring data while turning from one azimuth to another and reducing line change time can compensate for the extra cost of additional azimuths," Kapoor said.

"For smaller surveys, line change time can be equivalent to recording time and thus a significant overhead," he added.

And multi-azimuth surveys do allow some flexibility in avoiding bad weather conditions, Kapoor observed.

"Depending upon currents and wave direction," he said, "you can reduce your downtime considerably by choosing the optimum direction you want to shoot in."

A Full Set of Tools

Summers tends to look at wide-azimuth seismic as a set of tools to be selected and used according to the project at hand. This depends on subsurface imaging challenge and exploration to production objectives.

"At BP, we see wide-azimuth seismic as a toolkit that encompasses a string of

technologies," he explained.

"In shallow water, we can get wide-azimuth seismic from ocean-bottom cables, and we've been doing that for quite some time, such as at BP's permanent installation over Valhalla in the North Sea used for reservoir monitoring," he said.

"Scaling up wide-azimuth towed streamer surveys is best for very large surveys oriented toward exploration and appraisal, while "ocean-bottom node systems are very well-suited to field development and production-scale surveys in deepwater," according to Summers.

"All of this new acquisition has required improved and new processing algorithms," he noted, and handling the huge amounts of data – facilitated by increased computer capacity – is essential in the new subsalt work.

"You acquire five to six times as

much data as you would conventionally," Kapoor said. "You get a lot higher fold, as well."

WesternGeco is in the fifth phase of a multiclient, wide-azimuth survey in the Gulf of Mexico, which already has covered almost 900 OCS blocks, Kapoor said.

Data goes through fast-track processing for a preliminary look, then additional processing for refinement.

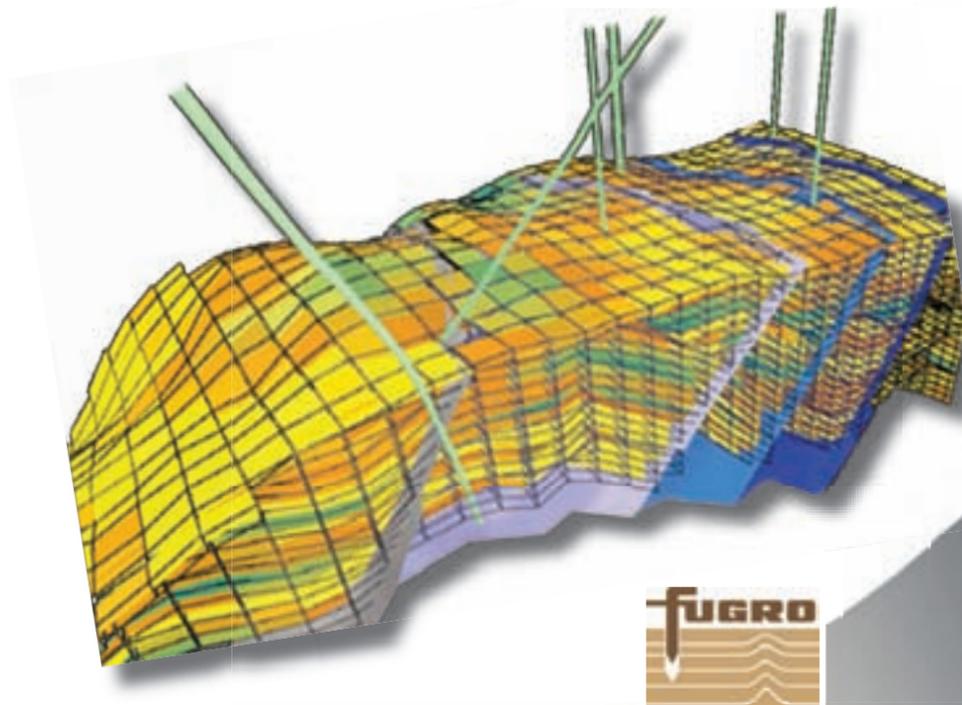
"We've already put out products that look pretty good compared with the conventional surveys with just fast-track processing. But we're doing further processing to help us build better velocity models," Kapoor said.

"We're also developing multiple-attenuation techniques that are more suitable for wide-azimuth seismic," he added. "This data probably will be

continued on next page



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Ex-Pats follow 'THE' game

Talk to experts in wide-azimuth seismic and you find that many are interested in The Game.

No, not offshore exploration. Cricket.

"There's almost 40 teams in Houston," said Jerry Kapoor of WesternGeco. "It's a pretty thriving cricket league."

Tom Bass Park in south Houston has five cricket pitches where you'll likely find matches in progress on the weekend, Kapoor said.

A cricket pitch is a defined, rectangular area 10 feet wide by 22 yards long where a bowler delivers the ball toward the batsman.

Kapoor is a member of the Memorial

Cricket Club and plays for the Texas Olden Goldies. No longer competing at top-level cricket in the league, Kapoor said he plays "more for fun now."

"I used to be a pretty good bowler," he said. "I don't bowl fast anymore, just the slow stuff. And I can bat a little bit."

Expatriates in Houston still manage to follow their favorite clubs and national teams.

The Ashes, an historic and fiercely contested test match series played every two years between England and Australia, will be held in England next year.

"It definitely matters to me who wins the Ashes ... England, although this will be a tall order," said Tim Summers of BP

in Houston, who follows cricket through the Internet.

Enthusiasts keep up with the latest news and results on Web sites like www.cricinfo.com, where you can put together your own fantasy cricket team.

And satellite television now makes cricket matches available for viewing just about everywhere in the world.

"People watch the big games in Houston, although sometimes it's in the middle of the night," Kapoor said.

Even from Texas, he was able to follow a tightly played – and sometimes controversial – test match between India and Australia in Sydney earlier this year.

"It was some good cricket," he said.

– DAVID BROWN

continued from previous page

reprocessed many times in the coming years."

Leading the Way

Large-scale, offshore wide-azimuth surveys for subsalt imaging represent a fairly recent development for the industry.

Other forms of multi-azimuth and wide-azimuth already are being applied globally. BP's multi-azimuth surveys in Egypt since 2004, for example, and wide-azimuth using ocean-bottom cable in many basins.

Wide-azimuth land surveys have been around much longer, in part because the streamer-width limitation doesn't exist on land. You can spread out geophones and cables onshore and leave them for acquisition.

But onshore wide-azimuth surveys haven't had the robustness of offshore work.

"In land surveys we acquired data with wide-azimuth, but the fold was not very high at each azimuth," Kapoor said.

Because wide-azimuth gathers so much data, processing can help eliminate multiples, those seismic events made by energy reflected more than once. Dropping out the weaker signals isn't a perfect solution, however.

"It doesn't attenuate all multiples," Kapoor noted. "There are certain types of multiples that are still fairly strong."

"And because of the complexity of the salt geometry, there are areas where you don't get any illumination," he added. "You don't get any rays coming back to be recorded."

Getting Better

On a global scale, wide-azimuth seismic concepts for subsalt imaging undoubtedly will spread to other subsalt play areas. Kapoor said offshore West Africa, India and Brazil are natural next steps.

"There are a lot of other places that will be looking at this technology," he said. "But right now, it's pretty heavy in the Gulf of Mexico."

Despite the much higher cost of wide-azimuth over conventional seismic surveys, soaring exploration costs and attractive potential returns have convinced oil companies of its value.

Multiclient surveys, like those conducted in the Gulf by WesternGeco, CGGVeritas and others, reduce the per-company cost.

"The economics are there," Kapoor noted.

Looking ahead, Summers sees the following challenges for offshore wide-azimuth and multi-azimuth work:

- ✓ Improving acquisition design.
- ✓ Continuously developing the processing toolkit.
- ✓ Developing new and better interpretation workflows.

"Ultimately, what we would like is a shot and a receiver at every survey point. If we could afford it, that's what we'd do. But you just can't afford it," he said.

Of course, the newest thing is only the newest until the next thing comes along. A new revolution could be on the way in offshore seismic.

Call it a revolution of revolutions. "We're looking at, 'Can we acquire full-azimuth data?' We've done some tests where we've acquired data in circles, which we call a coil shoot," Kapoor explained.

"You acquire multiple circles so you get full-azimuth," he said. "And we can actually do that with one vessel instead of multiple vessels." □

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*Different locales pose unique challenges***Global Business Has Local Hurdles**

By LOUISE S. DURHAM
EXPLORER Correspondent

Despite continuing volatility in commodities prices, the seismic crews just keep going, acquiring data in numerous locales around the globe.

Currently, the working crew tally stands at 305 worldwide with 85 crews still available, according to the mid-January issue of World Geophysical News (WGN).

In comparison, the numbers reported in WGN last July 15 came in at 277 and 98 respectively.

Once again, the United States leads the pack with 76 active crews, or 25 percent of the total, with neighboring Canada accounting for 23 crews, or 8 percent.

The remaining 206 active crews are scattered far and wide in various countries, where myriad challenges for the seismic data gatherers can include cultural, logistical and governmental issues.

Additionally, there are the usual problems indigenous to seismic surveys, such as difficult-to-navigate terrain, noise-rendering infrastructure and more.

A Passage to India

Look at India, for instance, where Global Geophysical Services kicked off a shallow-water, 1,000-square-kilometer 3-D survey in January for client ONGC. The seismic program is concentrated in the Gulf of Khambhat on the western coast of India, southeast of the Kathiawar Peninsula.

"It's one of the most challenging shallow marine areas in the world," said AAPG



Photos courtesy of Global Geophysical Services

Sometimes the challenges for international geophysical crews are physical, and sometimes they are geopolitical – and sometimes, like those for this crew working a rugged spot in Kurdistan, they're both.

See **International**, page 22

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International

from page 20

member Richard Degner, president of Global, which currently has half of its 14 crews working the international scene. "There are six meters of tidal change and three-to-four-knot currents associated with those tidal changes that rip in and out of the Gulf of Khambhat into the Indian Ocean.

"The ocean bottom cables have to be specially designed so we can deploy them down to the bottom so they stick and don't get blown around in these extreme currents."

A number of modifications were



Degner



Scott

required to accommodate the currents. These included constructing metal frames for the sensor package to lay on when the cable is deployed.

These frames keep the receivers in place and ensure there is no movement once the receiver hits the seafloor.

"Another challenge with the currents is that they generate noise, especially on the

geophone," said Larry Scott, Global's vice president for worldwide marine. "A three-knot current going over the geophone will shake the casing and generate a signal.

"We're working closely with our data processing technology partner, Weinman GeoScience, on various noise attenuation techniques to allow data acquisition to continue in higher current flows than normally practical.

"This is a very intense survey," Scott noted, "with extremely high specifications in terms of both seismic and positioning data quality."

"Expect the unexpected" remains the motto when deploying crews on the international scene.

Daunting Tasks

To add to the Khambhat challenges, the nearest port for moving gear and personnel back and forth to the crew is the tidal port of Surat, where boats may have access only twice daily.

The plan is for the crew to work until the monsoon season, which runs from the start of June through September, and then rev back up in October with the goal of calling it a wrap in the spring of 2009.

Assembling the vessels needed for the India survey was in itself a daunting task.

Eight vessels are working there, including Global's flagship transition zone boats from the United States – the *Vision* and the *Quest*. These are joined by the mother ship chartered out of Singapore and a couple of speedboat-like shallow draft aluminum jet-drive boats from Australia, which were modified to be especially effective at moving cable in strong tides and currents.

The source and support vessels were chartered out of Dubai, where Global has a support base to rig its land crews.

"Most of the recording gear was new and shipped out of Houston and Europe," Degner said. "Everything converged in India, and we spent two months getting the crew all rigged out and finalizing permissions."

Still, "expect the unexpected" remains the motto when deploying crews on the international scene.

When Global shipped the gear out of Houston last August for a planned shoot in Kurdistan, a bit of angst ensued.

"The gear headed to the Mediterranean for a port in Turkey where it then would skirt along the Turkish border by overland convoy headed for northern Iraq," said Maurice Flynn, vice president for Europe and Middle East at Global.

"Soon after we loaded the equipment on the boat in Houston, all the border skirmishes between Turkey and Kurdistan flared up," Flynn said. "Based upon its destination, we weren't sure if the equipment would be discharged at the Turkish port, and if it was whether it could get through to the border and then pass through into Kurdistan.

"As it worked out, we were in Iraq in less than seven days after landing in Turkey and had the crew working two weeks later."

Northern Iraq: 'A Different World'

Kurdistan is in a 2-D phase today, given that much of the seismic work in the region is being conducted for exploration purposes.

This is the mindset at WesternZagros Resources, which contracted Global to implement a 500-kilometer 2-D survey in Kurdistan. The project is a mixed source program using vibroseis supplemented with dynamite infill where necessary.

"Our objective is to get as much 2-D seismic coverage as we can to evaluate the potential for hydrocarbon accumulations on our acreage," said Ke Lovan, staff geophysicist at WesternZagros. The company was spun off from Western Oil Sands (WOS) along with the Kurdistan acreage upon Marathon's purchase of WOS.

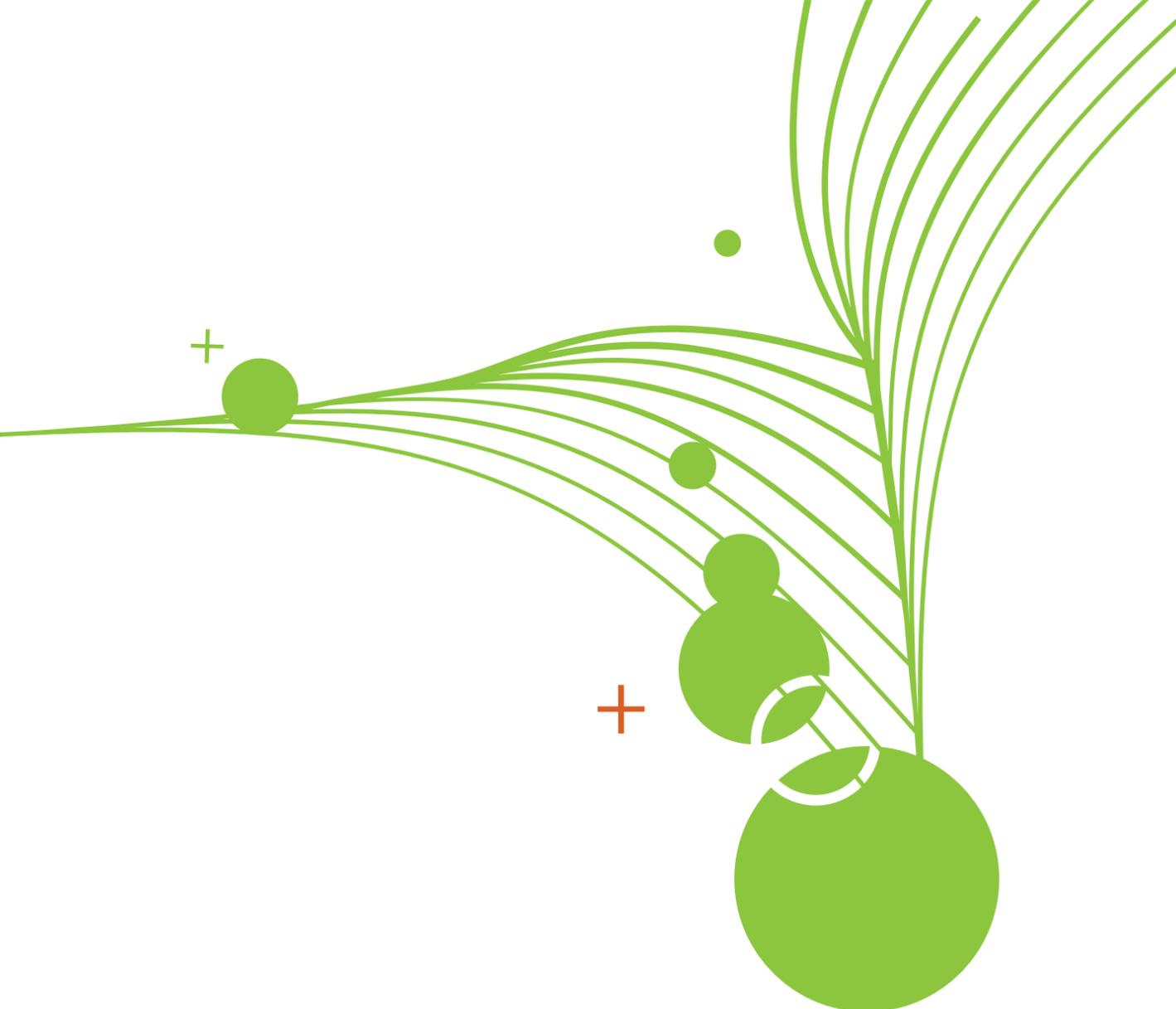
"We hope to identify large features and structures," Lovan noted. "They'll be primarily structural traps, with a major stratigraphic component.

"The reservoirs in this region are primarily Tertiary and Cretaceous, and reservoir targets are all over the board as we're in a fold and thrust belt," Lovan said. "You have surface seeps of both oil and gas.

"Existing wells have both shallow and deep pay zones," he said, "with some drilled beyond 5,000 meters."

The seismic survey kicked off last

See **Challenges**, page 24



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Headed for international duty: The 60-foot *Global Quest* (left) was transported to India for a challenging shallow marine program in the Gulf of Khambhat; the 60,000 pound vibrators spent their time in Algeria.



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Challenges

from page 22

November and is anticipated to require as much as five months.

Despite the widespread turmoil in Iraq, the oil industry folks are showing increasing interest in operating in this country known to harbor huge oil reserves.

"Before 2007, there were only three oil companies operating there," Lovan said. "Now there are over 20."

Security remains a challenge for oil industry personnel in the country as a whole, yet the Kurdistan region itself is not particularly off-putting.

"The northern part of Iraq is quite a different world," Lovan noted. "Kurdistan itself is a peaceful region that has been semi-autonomous since the early 1990s. Prior to Global, only one seismic company was willing to set up shop in northern Iraq to run a seismic program."

For anyone contemplating a seismic project there, it may be reassuring that Degner refers to Iraq as a "piece of cake" compared to some other international surveys they've done.

Degner gives kudos to Oman as well, where Global is ramping up a brand new crew for a 2,800-square-kilometer 3-D program for BP.

"Oman being in the Arabian Peninsula with proximity to Dubai provides the ability for support within the Gulf Emirates," Degner said. "So it's a pretty easy place to execute into and operate in."

"This is a very large channel count survey, a 10,000 channel Sercel 428 shoot," he noted. "The crew has 12 80,000-pound vibrators with the new Sercel 464 vibe electronics, all shipped over from Houston. This project is one of the new ultra-progressive Vibroseis applications."

It's a survey with a very high trace density, Flynn said – and the largest single 3-D survey recorded in Oman.

Preparation is Crucial

The multitudinous pieces that must come together to make one of these international crews a reality can be a bit mind-boggling.

In fact, Degner cautions that if you want to pursue work a year from now, it's prudent to begin preparations today.

"It takes that long to manufacture, build and deploy all those assets," he said. "When these deployments happen, we have the group in Houston that gets all the recording gear, the huge vibrators and other technology together."

"Then it's the local guys – like for Oman, our Dubai-based group – who build the camps locally and purchase the trucks."

"In fact, for both the Middle East and North Africa, we typically build our camps for several hundred people out of Dubai, purchase the trucks in Dubai and build the trailers," he said. "There may be a hundred pieces of trucks and camps, including rolling stock, that goes into these big vibroseis jobs especially."

"For Iraq there may be only 50 or 60 pieces, like camp trailers and trucks," Degner said. "For our survey in the Nuequen Basin in Argentina, we have about 80 or 90 pieces of camp and rolling stock."

"When these mobilizations occur, we buy all new equipment – including the support equipment – locally," he noted. "This includes trucks ranging in size from big semi-trucks to pickups, each with a different application such as hauling water, food, personnel."

"It's more cost-efficient, and you can support the equipment better if it's purchased in the local economy," Degner noted.

"The tax regime usually requires it, anyway." □

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Geology drives changes in geophysics

Salt Stymied GOM Progress

By DAVID BROWN
EXPLORER Correspondent

In the early 1990s, exploration success began to dry up in the deeper waters of the Gulf of Mexico.

"We knew there was a world-class working source system and well-developed reservoir. We knew the basin was structured. But we weren't finding new fields," recalled Cindy Yeilding.

Yeilding, an AAPG member and former Distinguished Lecturer, is exploration performance unit leader for BP in Houston. She describes her job as exploration manager in the Gulf of Mexico.

At that time, the oil industry considered the Gulf a promising province for deepwater fields, so the lack of progress was even more disappointing.

A series of discoveries in the 1980s, as drilling stepped further offshore, had raised explorers' hopes.

"The first really big, exciting deepwater discovery was Ram-Powell in 1985. Then Shell and BP made the discovery at Mars (in 1989). Next Ursa followed, along with some other discoveries.

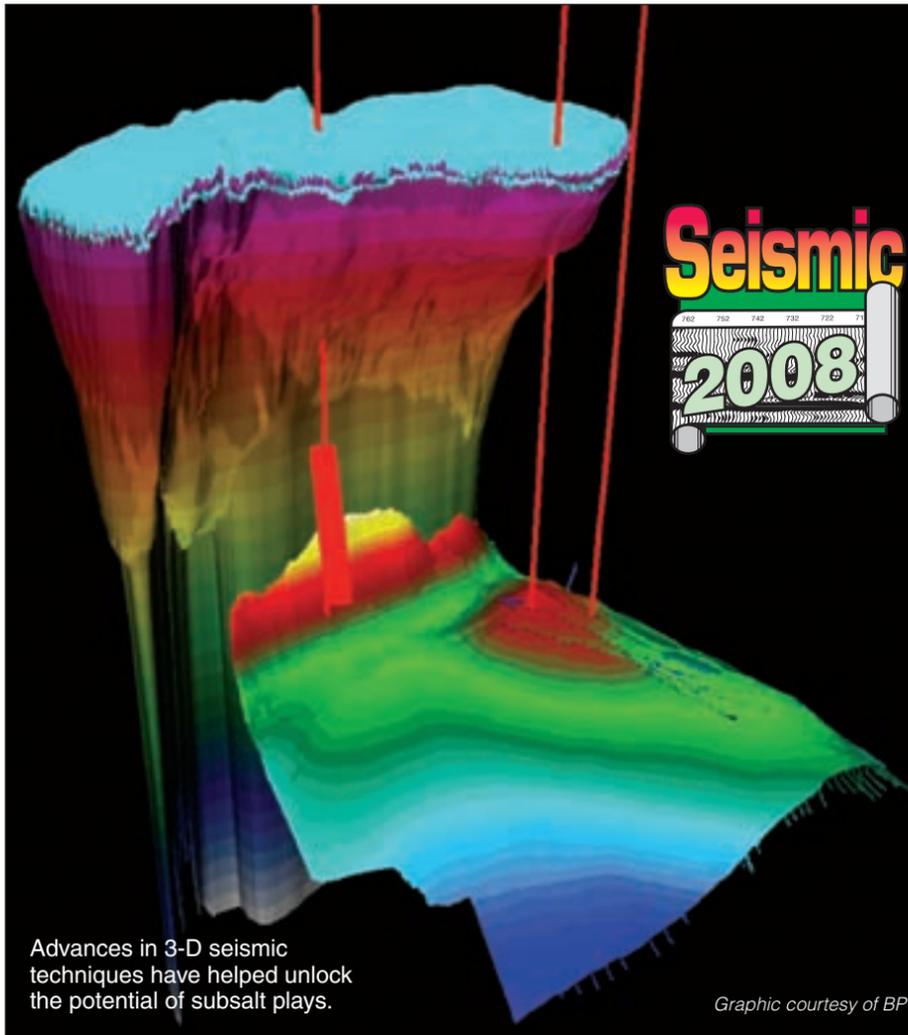
"Then they tapered off right after that," Yeilding said.

In brief, the prospect evaluation problem could be summed up in one word:

Salt.

Exploration had progressed far enough offshore to be stymied by the extensive salt bodies that dominate the Texas-Louisiana Outer Continental Shelf (OCS) and slope.

Present-day Gulf salt bodies were once part of the deeper, Jurassic Louann salt, or



Graphic courtesy of BP



Yeilding

mother salt. According to the U.S. Minerals Management Service, allochthonous tabular salt in the Gulf of Mexico characterizes subsalt plays there. The salt can appear in sheets, tongues, nappes or canopies.

Exxon hit on a Gulf subsalt play in 1990, when it found oil and gas on its Mississippi Canyon Mica prospect. But seismic work for the industry began to stumble.

"Going back to the late '80s and early '90s, it was very difficult to see anything under the salt," said AAPG member Jerry Kapoor, WesternGeco imaging group manager in Houston.

"It was pretty much like a blurry, snowy TV picture."

Subsalt in the Spotlight

As we all know now, this story has the happiest of endings.

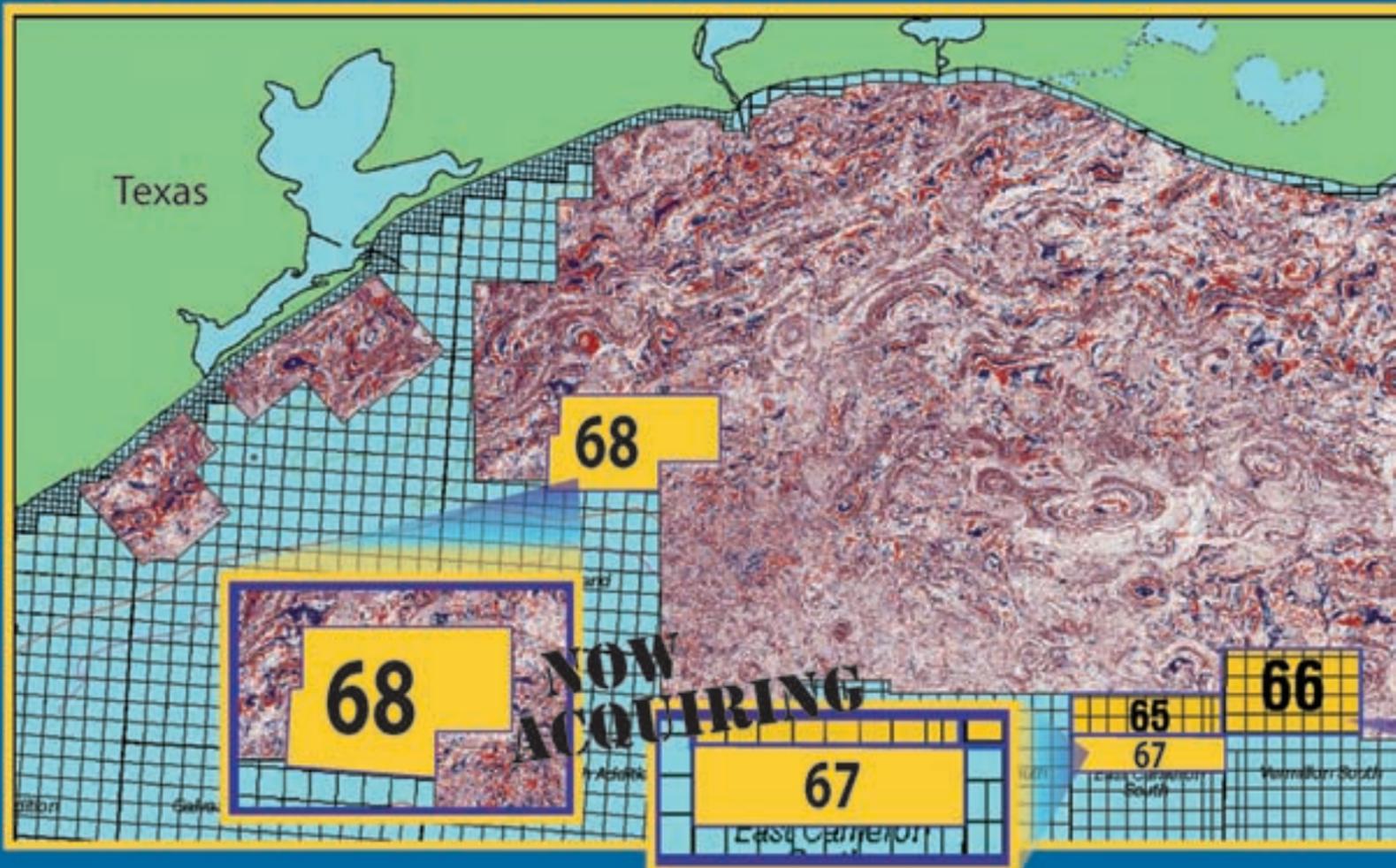
BP was about to begin the work leading directly to its discoveries at Atlantis, Mad Dog and Thunder Horse.

Along the way, the industry would find Gulf hydrocarbons at Mahogany, Fuji, Enchilada and Gemini.

Those would presage other, major deepwater and ultra-deepwater discoveries in the new century's first

continued on next page

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High Island (68) & E. Cameron S. (67)
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continued from previous page

decade, including names like Marco Polo and Tahiti and Great White and Tobago and Jack.

Developing the ability to image, evaluate and explore subsalt prospects offshore is one of the truly great success stories of the modern oil and gas industry.

AAPG's Annual Convention in San Antonio in April will offer abundant opportunities for insight into the industry's current understanding of salt and subsalt exploration.

Yeilding and Holly Harrison of BP will serve as co-chairs for a poster session on Subsalt Plays of the World on Tuesday afternoon, April 22.

Harrison is a veteran Gulf of Mexico geologist who like Yeilding has been on the cutting edge of salt and subsalt exploration – including a crucial role in the important Mahogany discovery.

Overviews and updates, ranging from the Gulf of Mexico to Australia to Morocco, will include the current and highly publicized subsalt exploration taking place in the Santos Basin offshore Brazil.

Presentations on Monday, April 21, include the sessions New Insights into Allochthonous Salt Tectonics in the morning and Salt Tectonics at Active and Passive Margins in the afternoon.

Salt tectonics also will be the subject of a Tuesday afternoon poster session, and several other papers and posters throughout the meeting will touch on salt-influenced exploration and development.

Challenges to Overcome

In fact, most presentations will deal with subsalt success stories. But 15 years ago, the industry was losing headway in the Gulf

See **Subsalt**, next page

Salt's shroud a tough obstacle

Until the mid-1980s, once the drillbit tasted salt, it was time to stop drilling – because everyone “knew” there were no hydrocarbons any deeper.

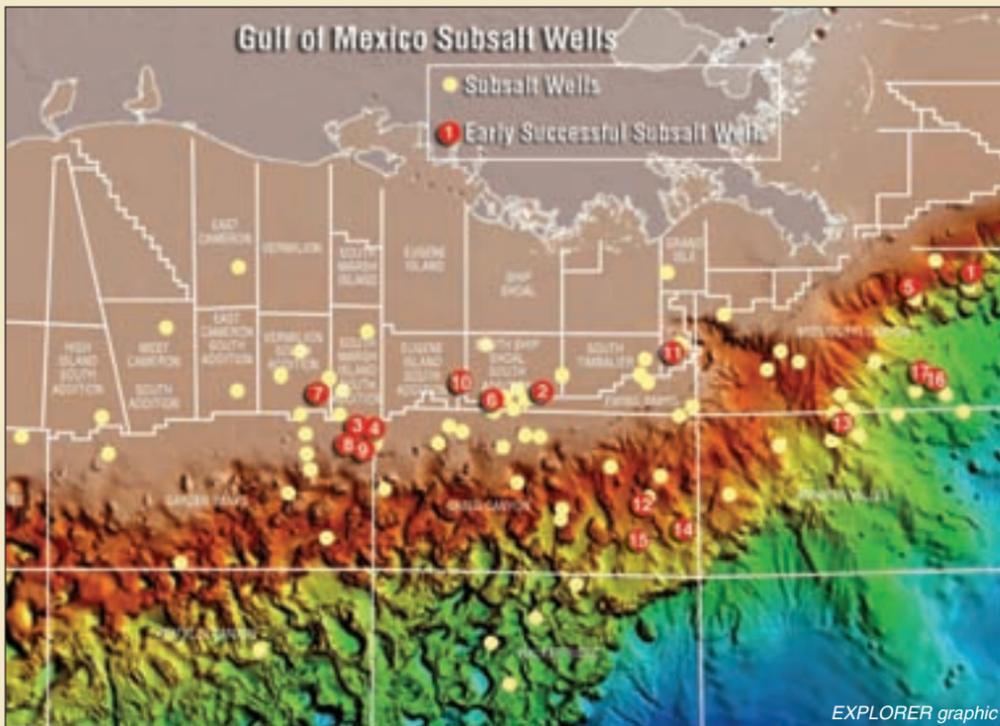
There were some subsalt penetrations, including drilling to test anomalous seismic reflections when hydrocarbons were expected.

According to the U.S. Minerals Management Service, an important 1986 well by Diamond Shamrock drilled through a 990-foot sheet of salt to find 1,000 feet of reservoir-quality sandstone below the salt. The well was not commercial, but the potential was apparent.

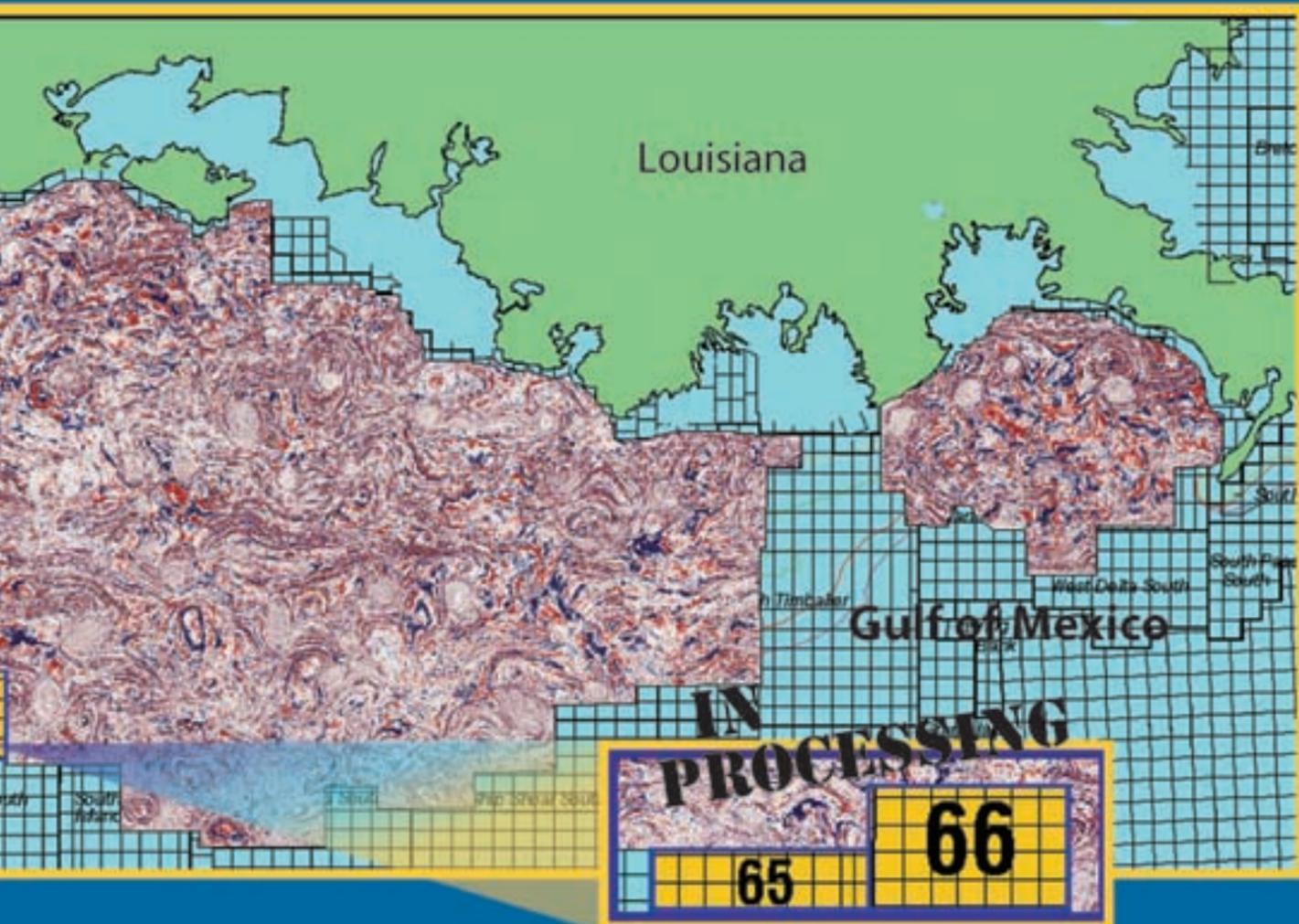
Efforts to “see” below the salt and tap the hidden potential began in earnest.

Early subsalt successful efforts and year of discovery included:

- | | | |
|---|--|---|
| 1. Mica – Mississippi Canyon, 1990 (began producing in 2002). | 7. Monazite – Vermilion 375, 1996. | 13. Champlain – Atwater Valley 63, 2000. |
| 2. Mahogany – Ship Shoal 349, 1993 (first commercial production in 1997). | 8. Conger – Garden Banks 215, 1997. | 14. Atlantis – Green Canyon 699, 1998. |
| 3. Enchilada – Garden Banks 128, 1994. | 9. Penn State – Garden Banks 216, 1997. | 15. Mad Dog – Green Canyon 826, 1999. |
| 4. Chimichanga – Garden Banks 127, 1995. | 10. Tanzanite – Eugene Island 346, 1998. | 16. Thunder Horse – Mississippi Canyon 778, 1999. |
| 5. Gemini – Mississippi Canyon 292, 1995. | 11. Hickory – Grand Isle 116, 1998. | 17. North Thunder Horse – Mississippi Canyon 776, 2000. □ |
| 6. Agate – Ship Shoal 361, 1996. | 12. K2/Timon – Green Canyon 562/563, 1999. | |



EXPLORER graphic



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Subsalt In Meeting Spotlight

The poster session "Subsalt Plays of the World," chaired by Holly Harrison and Cindy Yeilding, will be offered Tuesday afternoon, April 22, during the AAPG Annual Convention in San Antonio.

The session begins at 1:15 p.m. Posters will include:

✓ The Double Edged Sword: The Impact of the Interaction Between Salt and Sediment on Subsalt Exploration Risk in Deep Water.

✓ Lithospheric Stretching and South Atlantic Pre-Salt Petroleum Systems - Important Insights from the Espirito Santo Basin.

✓ Subsalt Structures In the Officer Basin, Australia.

✓ Diachronous Growth of Fold Limbs on the Mad Dog Anticline: Implications for Base-Salt Deformation in the Atwater Fold Belt.

✓ Subsalt Exploration Potential of the Moroccan Salt Basin.

✓ Extended Families: Predicting and Correlating Lacustrine Sourced Oils in a Pre-Salt Play, Santos Basin, Brazil and Along the Eastern Brazil Margin.

✓ Pre-Salt Structures in Offshore Southeast Brazil: Risk and Sensitivity Modeling of Critical Factors for Economic Feasibility.

Details and abstracts can be found online at <http://aapg2008ace.abstractcentral.com/planner>. □

Subsalt from previous page

of Mexico's waters.

BP ruminated on to make sense of its Gulf prospects, "then the logic moved to thinking the updip part of those structures was below salt," Yeilding said.

In regard to seismic, "most of the water was regional 2-D and subregional 3-D, but it was all time migration," she noted.

Time-migration imaging conventionally assumes that seismic waves are propagated in straight rays. For the complex subsalt targets in the Gulf, a better method was needed.

In particular, datapoints had to be migrated to or near their actual coordinate positions before traces were gathered into each seismic stack.

The concept of prestack depth migration already existed and had been used for subsalt imaging. However, it had never been applied to 3-D imaging of the complexity and scale necessary for offshore Gulf subsalt.

Yeilding said "a lot of innovation" was needed to meet the challenges of depth migration and velocity modeling for subsalt prospects. Also, acquisition, processing and interpretation proved time-consuming, complicated and very expensive.

"Initially we did work with Western over Mica," she recalled. "We did a 10 OCS block prestack depth migration. That was really cutting edge."

Fortunately, advances in computer technology enhanced the handling of very large datasets. Improved processing algorithms developed, and geophysicists continually refined their techniques for subsalt imaging.

"It's a very leaky industry," Yeilding observed. "One person will figure out how to do something and then the next person will learn to do it better."

The 21st Century Breakthrough

While the new approach led to a number of significant discoveries in the Gulf, by 2000 the industry had just about exhausted the possibilities of what began to look like limited data.

"We'd gotten to the point where we'd pretty much processed everything we could get out of narrow-azimuth seismic," Yeilding said.

"At BP we ran kind of parallel thought processes. First we looked at seafloor acquisition. Then we eventually got to a place where doing wide-azimuth streamer (see page 16) looked reasonable," she added.

As it turned out, both were feasible. Ocean-bottom cable or seafloor nodes could be used for broader seismic surveys, especially in shallow water.

But for deeper waters and extensive areas, BP turned to acquisition of wide-azimuth seismic using multiple vessels.

"Initially, the biggest challenge we had was logistical. Technically the concepts had always been there. The comment was that you needed a flotilla of vessels to run a wide-azimuth survey," Yeilding said.

Key to designing a wide-azimuth survey was a solid geological understanding of salt history, subsalt deposition, prospect environment, likely structure and potential geometries – not to mention the nature of the play itself.

"This is one of the places where the geological concepts drove the changes in geophysics," Yeilding said.

In only a few years, wide-azimuth and multi-azimuth seismic surveys have become the leading edge of geophysical work in the Gulf of Mexico.

"The uptake and the application has been incredibly fast," Yeilding noted.

"It's a step-change, but it's not perfect. We're still struggling with reservoir-scale imaging with subsalt," she said.

Anyone attending the AAPG Annual Convention can draw lessons and concepts from the descriptions of subsalt imaging and exploration, according to Yeilding.

It's a matter of visualizing a process developed to see what had never before been visualized.

"How do I take the concepts that have evolved in the subsalt and apply that to my area? What lies in the unimageable?" she said.

The development of offshore wide-azimuth seismic has taken subsalt imaging to a new level in the Gulf. New breakthroughs could bring further progress.

Yeilding knows that story isn't over. "Every month, every week almost," she said, "there's a big surprise." □

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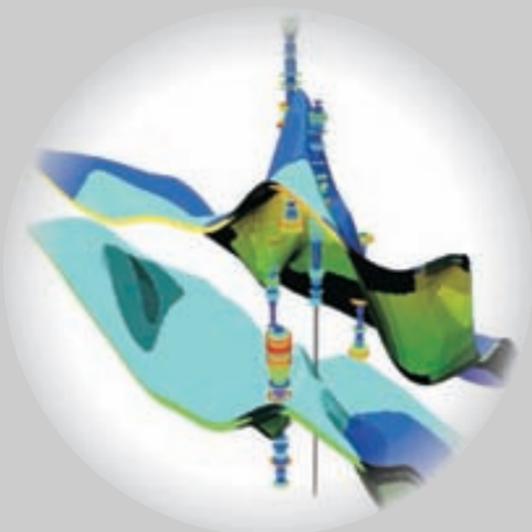
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Midland Valley Structure World

Welcome to this month's Structure World column from Midland Valley, we have lots to fill you in on. Along with new members to the team, we have created a new Knowledge Centre in Glasgow to meet the growing demands of our user base and help them get the best out of our software. To help you along your way we've included another interpreter tip for choosing the correct restoration technique.

We'd also like to draw your attention to our 25th Anniversary user meeting in September - please reserve your place now to avoid disappointment as spaces are limited.

For more information on anything in this column please contact us at help@mve.com

Midland Valley Knowledge Centre



Introducing Midland Valley's new Knowledge Centre. A dedicated client focussed team with a mission to provide you with the knowledge you need to get the best value from us and our software. Midland Valley client support has traditionally been solely related to Software IT and Geological Help. However with the Knowledge Centre, we are expanding this remit to enable our clients to get the best use out of Midland Valley Products.

Throughout 2008 we will be introducing a number of new initiatives to help improve our client services. Watch this space...

New recruit in the Glasgow office

Midland Valley would like to welcome our new geologist Dr Cecille Allanic, a recent Structural Geology PhD graduate from the Institute of Geology, Neuchatel, Switzerland, with extensive knowledge in fault analysis. Cecille has joined our expanding group of consulting geologists in the Glasgow office.

Silver Anniversary Events

To help celebrate our 25th anniversary this year we'll be attending the following events.

- GEO Bahrain, March 3 - 5 2008 Booth #660
- AAPG San Antonio, April 20 - 23 Booth #1326
- Midland Valley Silver Anniversary User Meeting Sept 30 - 2 Oct, 2008

More info? E-mail Sarah events@mve.com

For more info on our software and consulting or anything in this column call +44 (0)141 332 2681 or email help@mve.com



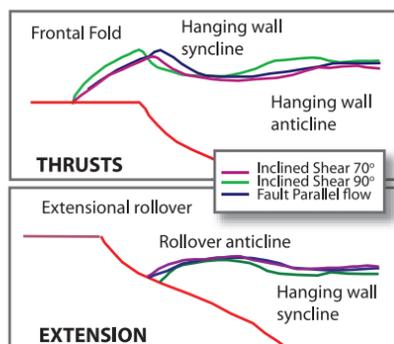
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Interpreter Tips: Choosing the correct restoration technique

How do I choose which construction or restoration algorithm to use and what's the difference?

The two simplest algorithms to use are inclined shear and fault parallel flow. Both can easily be done by hand drawn construction techniques to give good results. In poorly consolidated sediment, particularly in extension, you would usually assume inclined shear. You can think of this as a fence of inclined pencils moving down, or up a fault plane. If you are dealing with layered consolidated rocks in thrusting you'd choose to use fault parallel flow. Fault parallel flow assumes that deformation is accommodated on bed surfaces. This means that thickness at right angles to the beds and the lengths of beds are kept constant. Both techniques assume that you are working a section parallel to the direction the rocks are moving (transport direction) so that cross sectional area is constant.

Depending on which technique you choose you will get different amplitudes and shapes of the folds in the hanging wall. But as an interpretation tool, the important thing to realise is that there is a direct relationship between the folds and the fault shape. So once you are comfortable with this concept you can look at dip changes on say a seismic section and relate the dip change to an underlying fault geometry.



You can see the differences in the diagram above. By using these techniques you can add and remove layers to model growth or erosion.

More info? E-mail Louise at help@mve.com

Midland Valley Silver Anniversary User Meeting - Sept 30 - Oct 2, 2008

We are planning a special User Meeting to show clients our latest technology with presentations from Midland Valley and some of our users. The meeting will take place in Glasgow, Scotland on the 30th of September - 2nd of October, so make sure you have it marked in your diary. To close the meeting we are planning a ceilidh with traditional Scottish dancing (and whisky!) and a geological fieldtrip to show you some of Scotland's fantastic geology.

We are very keen for our users to participate in the event, if you would like to take part please contact us. Registration and hotel information is all on our website www.mve.com please check for details and let us know if you would like us to reserve you a place.

Contact Sarah at events@mve.com



Photos courtesy of Ascend Geo

Geographic challenges, technological demands and economic realities are making cableless seismic systems an increasingly prominent segment of today's seismic world.

Systems coupled

Seismic Crews Eye Cable-less Future

By LOUISE S. DURHAM
EXPLORER Correspondent

Mention land seismic acquisition to most any data acquiring contractor, and the ensuing conversation is likely to focus on the escalating trend toward increased channel counts - and the need for accommodating systems.

Cables have long been the mainstay of seismic data gathering programs. Yet the industry appears to be on the cusp of morphing from cables to cableless systems given the general consensus that mega-channel crews of 30,000 channels and much more are on the horizon.

As the channel count increases, it will become untenable at some point to connect them with cable.

A number of cableless systems already are available, e.g., FireFly at ION, UNlite at Sercel and Ultra at Ascend Geo. In addition, completely cable-free land nodes are a work in progress at Fairfield Industries, following on the success of its deepwater Z3000 node system.

The business drivers for cableless systems can be pretty straightforward.

"Our main goal has been to keep it as small, low power and flexible as possible," said Larry Denver, chairman and CEO at Ascend Geo. "This drops not only the operational cost for a crew via fewer people and trucks, it also makes the box simpler and less expensive to manufacture.

"We're trying to drive the price of the system down so you can increase the number of channels on the ground without increasing the crew," Denver said. "This is the key to the future of seismic."

"Every oil company we talk to wants more channels on the ground - they're after hi-def TV, if you will - but they're not going to triple the budgets," he said. "So we have to give them something that eliminates a lot of crew and trucks and is something these service companies can afford to pick up."

Laying the Foundation

But don't look for anyone to toss existing systems into the trash.

Adding channels via coupling a current cable system with the cableless product is a logical bridge between today's cable crews and the cable-free future.



"They're not going to just get rid of working systems," Denver said. "You have to be able to add to those and give them a way to manage that set of combined equipment going forward until they say 'well, that cable stuff is already depreciated so we're done with that and going to move forward cable-free with this crew.'

"This limits everyone's risk," Denver continued, "and that's the strategy behind our product."

The early adopters of the cableless approach to seismic are using it generally for one of three reasons, according to Denver:

- ✓ They want to lower costs.
- ✓ They need flexibility, e.g., ability to shoot passive seismic, 4-D, combine multi-component and standard arrays.
- ✓ They are confronted with environmentally sensitive issues, such as taking cables through a town or a protected environment.

"What we expect this year is that as our early clients go out and use cable-free for various jobs and find out they're easier to shoot with," Denver said, "then I think there will be broader acceptance."

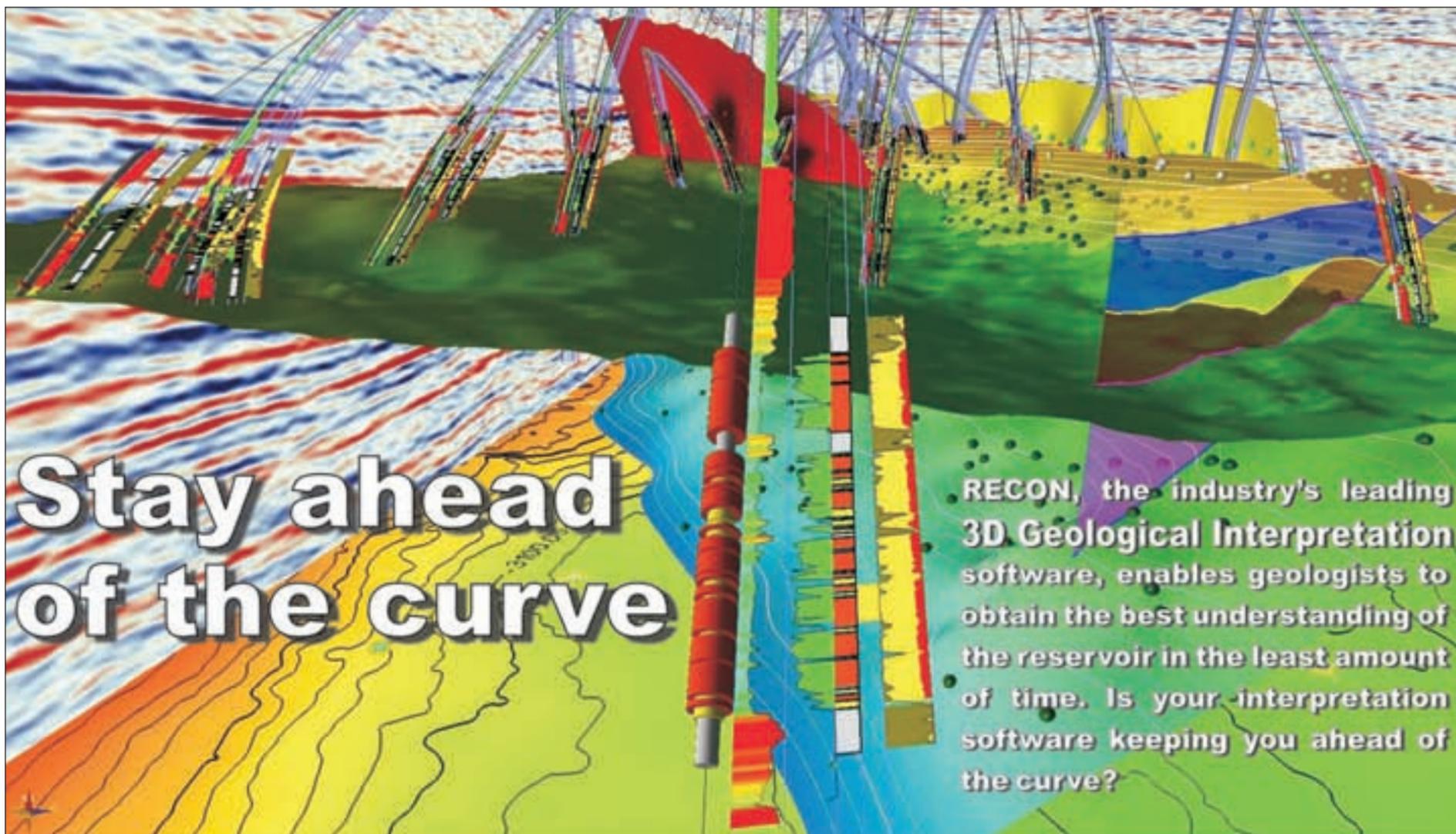
"Five years from now, we'll see an enormous uptake in cable-free, and new crews probably will buy just cable-free channels," he said.

"Right before that happens we'll see these channels filling in niche or specialty applications."

I Hear the Train a-Comin'

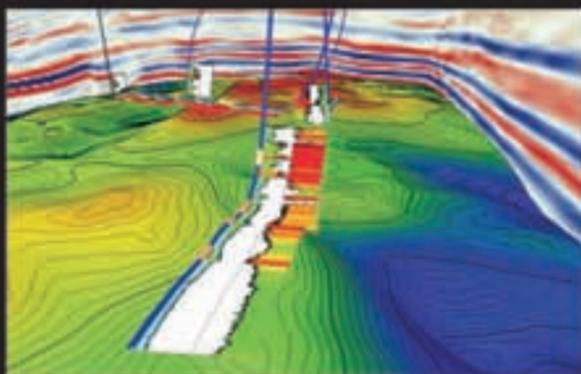
Passive seismic, which uses various natural sources such as the ever-present creaking in the subsurface, has been garnering increased attention the last

See **Cableless**, page 32



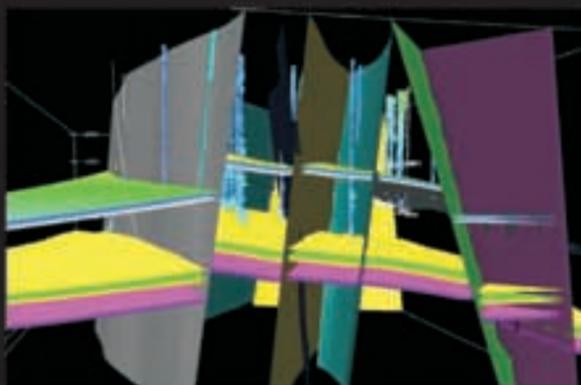
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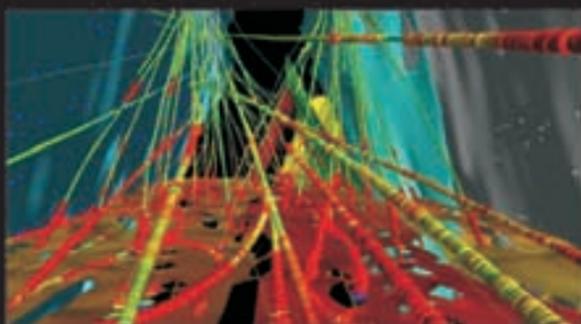
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Cableless seismic, for those hard to reach locations – and sometimes there's nothing like the sound of a train when you need a good source.

Cableless

from page 30

few years.

Ascend Geo has demonstrated a new twist on natural sources by using sound generated by an actual train as the source for a 2-D field trial in a culturally-intense area in the Barnett Shale play. Locales congested with ambient noise and culture make poor targets for conventional seismic acquisition and processing.

"Because our box is a passive box, it's always collecting data – it sits there and listens all the time," Denver said, "and we noticed data coming from the train was interesting."

The next step was to place boxes along the railroad tracks and let them sit and run for a couple of days and then

perform some processing. It was obvious there was an enormous amount of energy generated by the trains passing through the area every 15 minutes or so.

"There's a wide range of frequencies that this source brings in," Denver noted. "Permitting in these urban areas is difficult and expensive, and if we can get a handle on this as a source, it opens up a wide door to not only trains but other sorts of natural 'trains' of noise we could use to try to process seismic data."

The train noise itself is very promising as a source, according to Denver. He noted that after seeing some pretty good data, it's now a matter of trying to figure out processing issues to see if they can sort through and get some clear images.

"In March, we'll go back and collect an eight-to-ten-mile stretch of data where we'll run the boxes essentially for three-to-four days and collect data constantly," Denver said. "We think we can get enough data and a long enough stretch so we can cipher through where this source is at any particular moment, how fast it's moving and what that means to the processing."

"You don't typically have a source that's moving."

Problem Solving Options

It's not unusual to see challenges addressed via complex solutions using advanced technology. Yet it's the simplicity of the cableless system that's allowed folks to begin to look at some unconventional sources and surveys not possible with a standard system, according to Roger Haston, chief operating officer at Ascend Geo.



Haston

The technology conceivably could have a significant impact on 4-D programs.

"If you find a natural source you can use and you always listen, you could change the economics

substantially and learn a lot about the field," Haston said. "Even reservoirs creak and groan as they're produced and drained."

The new dynamic afforded via cableless systems goes right to the heart of data acquisition.

"Traditionally, interpreters and processors basically had to cope with surveys designed around what was practical and affordable," Haston noted. "Now that equation is starting to turn around a little bit to where you can start with the geophysical problem you're trying to solve and design surveys to do that without nearly the level of constraints in the past."

For example, Haston noted he might want to use 80 of the company's cableless boxes where he thinks he needs the resolution, then make a change as the survey moves beyond a specific geologic feature.

"It doesn't have to be any particular preconceived layout," he said. "So you start to solve problems in a very different way."

This is particularly advantageous for a survey using the Ultra system in the jungle in Belize.

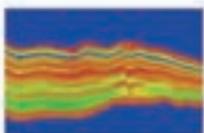
"You come up to a river and change the box to be one channel and the box on the other side to be one channel," Haston said. "Then you go back to doing three channels per box where you have no problems – it's very flexible and speeds up shooting substantially."

"Besides, when you're walking through the jungle you don't want to drag cables around," he noted. "Sometimes it's hard to tell which is the cable and which is a snake." □

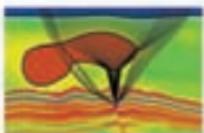


Solving the 3D puzzle

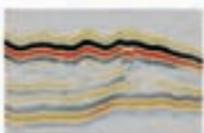
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Background Model: accounts for the seismic wave propagation effects down to and up from the target reflectors, including survey geometry, source, and overburden.

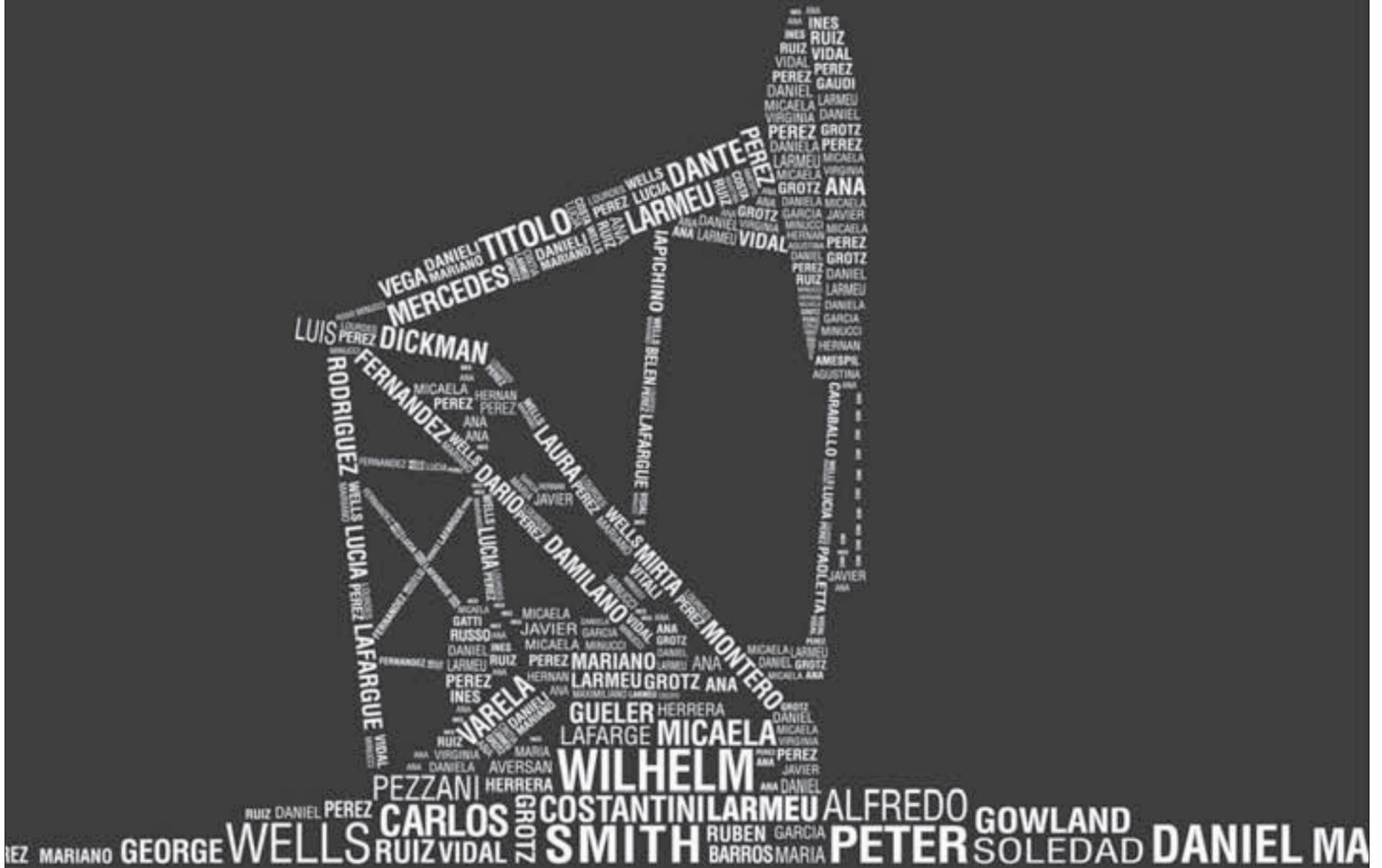


SimPLI: is a new methodology which enables the user to take the output of the multi-domain model and combine it with the illumination information generated by the background model and rapidly simulate accurate 3D PSDM images. The speed at which the images are created enables the user to perturb the properties within the multi-domain model and instantly see the effect on the seismic image.



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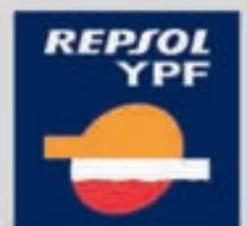
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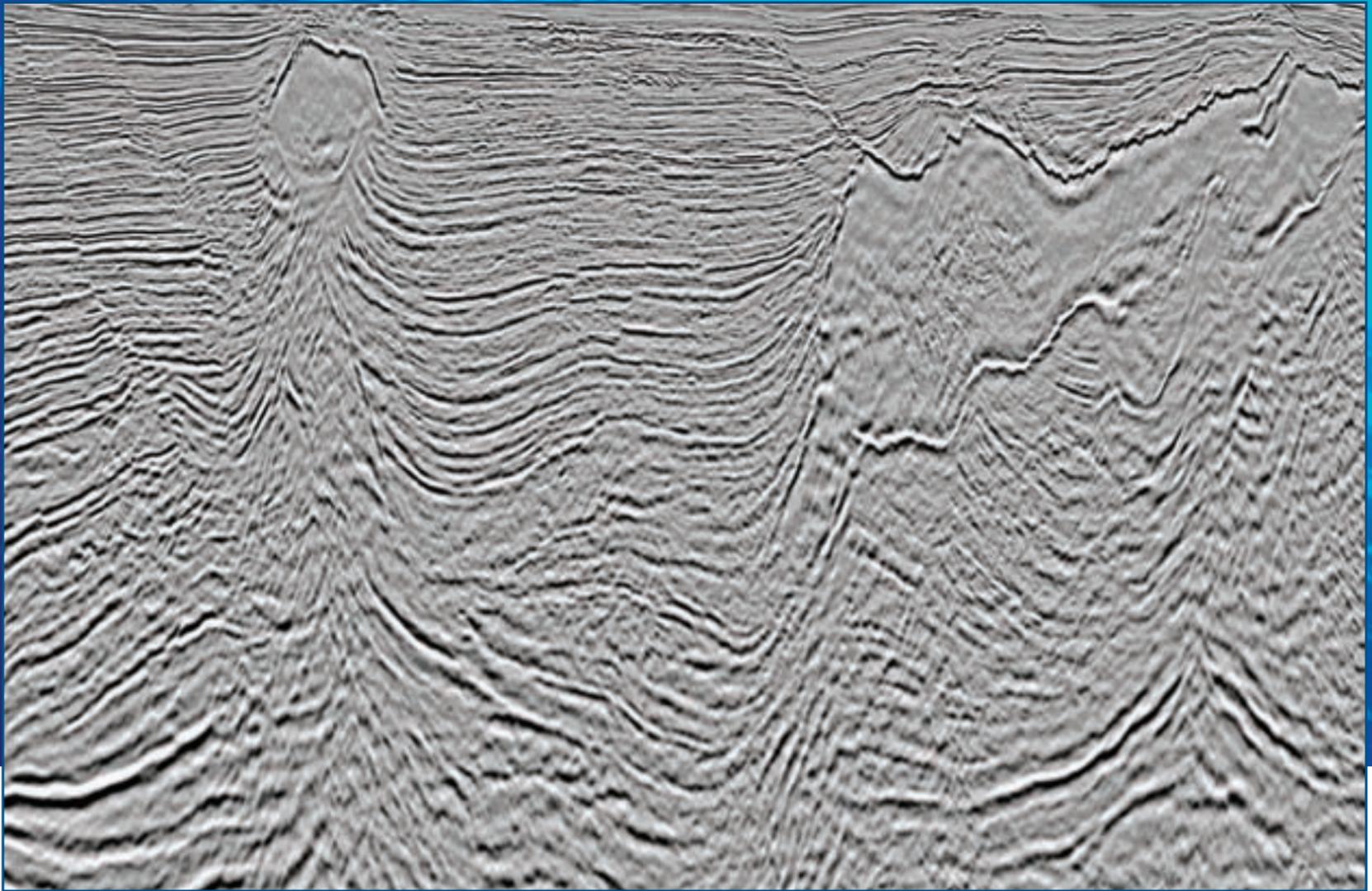
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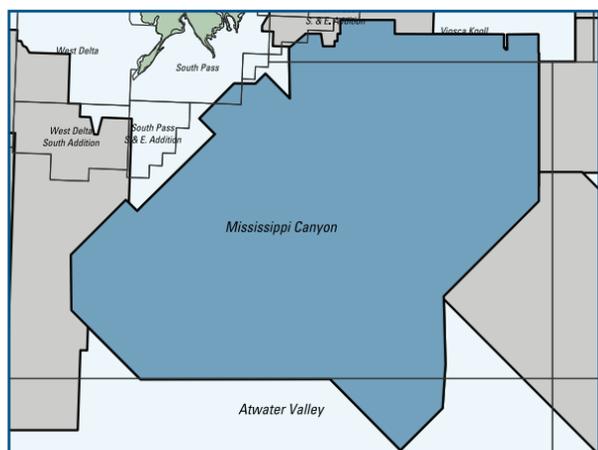
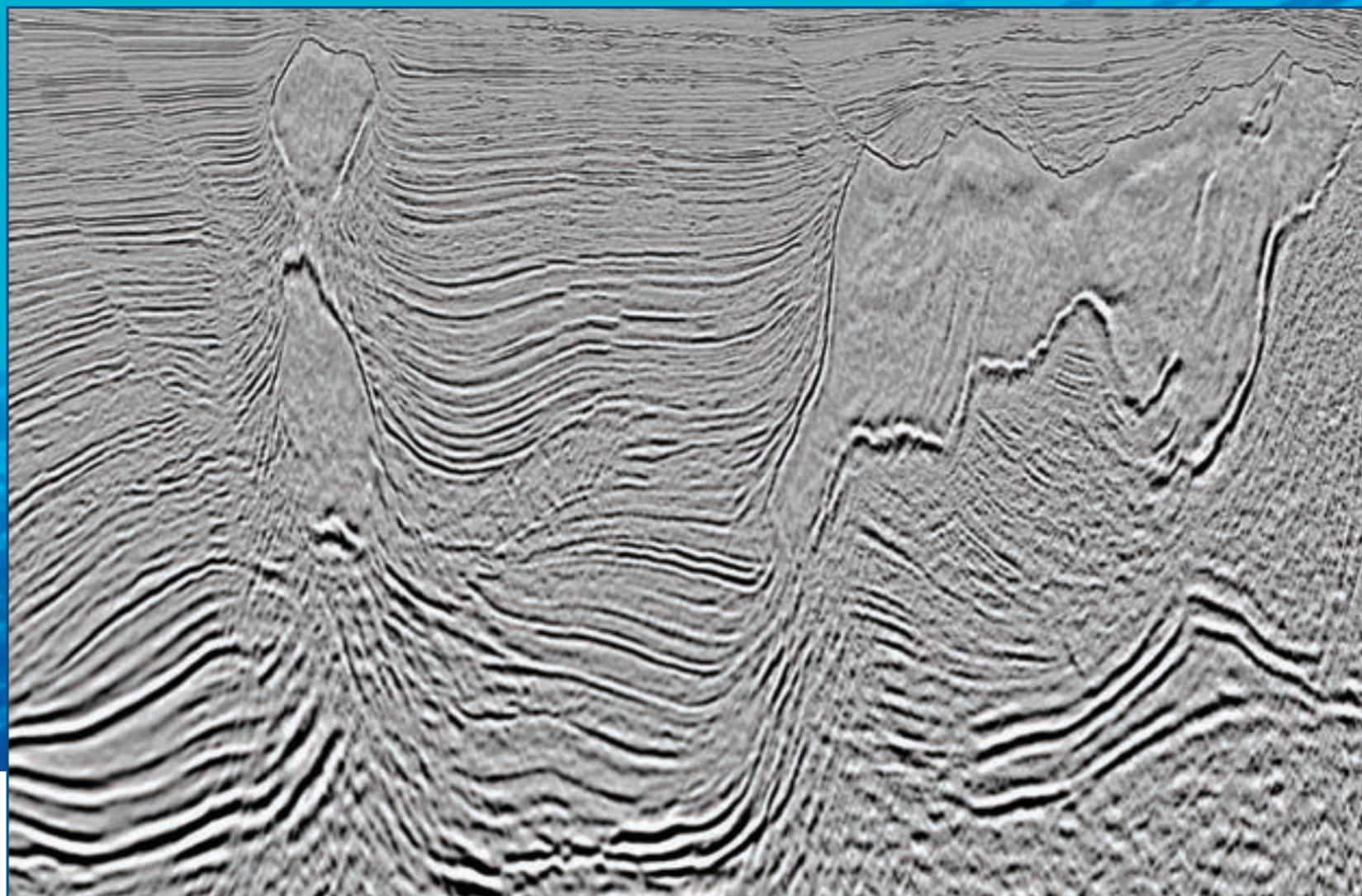
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Canada research initiative launched

Future to be 'Unconventional'

By BARRY FRIEDMAN
EXPLORER Correspondent

The Alberta Research Council (ARC) and Schlumberger have begun a research initiative in unconventional gas resource recovery and technology development, specifically targeting future gas production from immature shales in northwest Canada.

The reason is simple: Canada is running out of finding natural gas, as the late actor John Houseman might say, *in the old fashioned way*.

"The future for Alberta's gas production lies in unconventional gas resources,"

said Ian Potter, vice president energy at ARC.

And that resource, most agree, is the immature shale reservoirs in northwestern Canada.

Alberta provides much of Canada's natural gas, but little comes from shale or other unconventional reserves. And as the opportunities in conventional gas reservoirs decrease, these alternative arenas are becoming increasingly crucial to meet market demands.

Estimates vary as to how much shale gas is in the Western Canada Sedimentary Basin, but it is believed to be

anywhere from 86 to 1,000 trillion cubic feet (Tcf). At the present time, there's only five to six trillion cubic feet being extracted.

Immature shale reservoirs may pose the best opportunity for high yields, but they also provide substantial technical and financial challenges – which is why ARC formed the alliance with Schlumberger, through its TerraTek Geomechanics Laboratory Center of Excellence.

"Our expansion into the Alberta unconventional gas sector is strategic as we seek to develop new services to tap

unconventional gas. This research collaboration will grow Alberta's unconventional gas play and is a natural fit for Schlumberger," said Derek Normore, president of Schlumberger Canada.

"Additionally," he said, "Schlumberger will provide field and laboratory operations in Canada for core analysis related to unconventional gas recovery from shale and coal bed plays. This provides our clients with extended services related to the production optimization of unconventional gas."

Blaine Hawkins, principal engineer and technical manager, Enhanced Gas and Oil Recovery for ARC, says the council works with both industry and government – regionally, nationally and internationally.

"We deliver innovative science and technology solutions to meet the priorities of industry and government in Alberta and beyond," Hawkins said. "We do this by supporting the growth of innovative companies by extending an organization's technical services and research and development capabilities."

Immediate Obstacles

As for the shale project, there are some immediate obstacles: While the price of oil is up, the price of natural gas is not, which could be a potential problem in finding companies to invest the kind of money and resources on a long-term basis necessary to extract the natural gas.

Hawkins believes, even now, with natural gas prices around \$7 mcf, it's still doable. Ideally, though, he thinks the price of natural gas probably has to reach \$10 mcf for it to make total economic sense.

When asked what will happen if the price doesn't increase, Hawkins said he could imagine a scenario where the project is scaled back, but is convinced it will begin and move forward regardless.

The reality, though, even if prices stay low, is that Canada will have to look for natural gas in new and often more expensive places than before, and this project is recognition of that fact.

The initial research program will focus on improving gas production from immature shale reservoirs by applying advanced rock characterization and non-damaging fluids fracturing technology.

The potential is great, but so is the risk, which is why the ARC targets companies, then establishes and coordinates consortia that will share the risk and accompanying rewards.

"We provide a way to leverage the technological funds," Hawkins said. "Lower their risk and give them the highest probability of success. Royalty-free technology. It gives them a leg up (on non-consortium companies)."

As for the specific project, Hawkins knows it will not be easy.

"Shale is tricky." □

The Alberta Research Council, established in 1921, is wholly owned by the government of Alberta and incorporated as a not-for-profit corporation.

Its mission is to deliver innovative science and technology solutions that meet the priorities of industry and government in Alberta and beyond.

The council operates in five facilities throughout Alberta, serving the energy; life sciences, including agriculture; environment; forestry; and health and wellness sectors.

ARC works with many companies – such as Schlumberger in this initiative – to find solutions to energy problems. □

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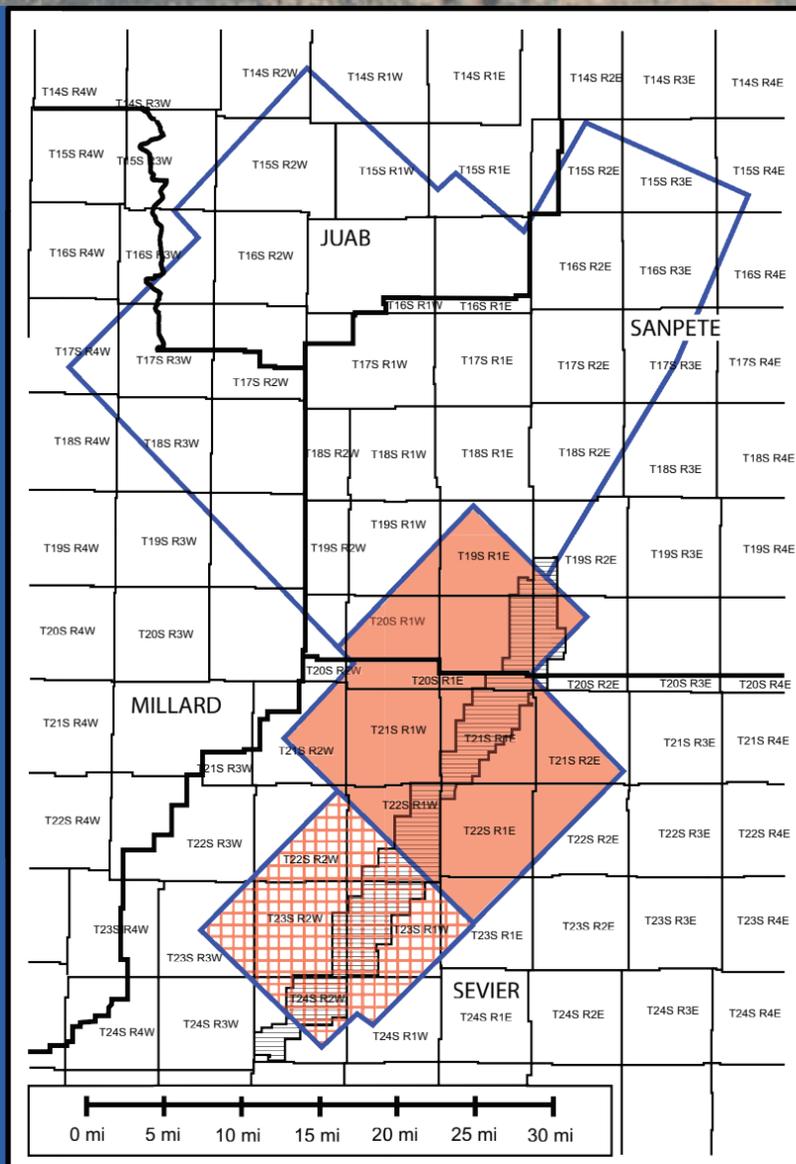
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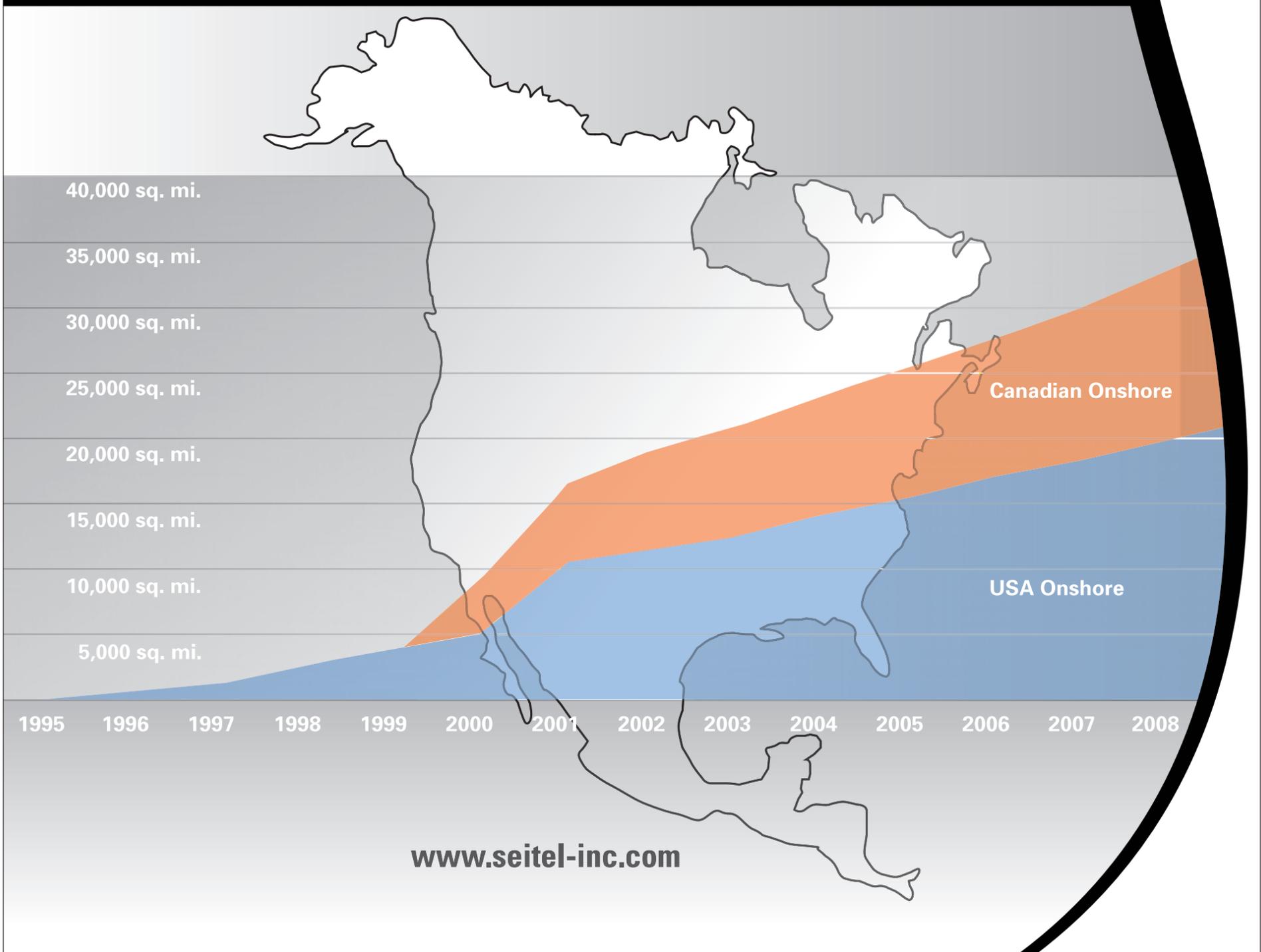
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GEOPHYSICALcorner

'Instantaneous' an Ideal Indicator

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

By **BOB HARDAGE**

The numerous seismic attributes that can be calculated with various interpretation software packages are based on three fundamental wiggle-trace attributes: amplitude, phase and frequency. Because these attributes are calculated at every time sample of a seismic trace, they are referred to as "instantaneous" attributes.

Constructing attributes as instantaneous functions is important, because interpreters then have more flexibility in how they use the attributes.

For example, a time-based attribute can be analyzed along an interpreted horizon (only one data point thick); within a thin data window (three or four data points thick) that conforms to a reference surface; or averaged throughout an extensive data window (several tens of data points thick) that spans some portion of seismic image space.

Most seismic interpreters, including

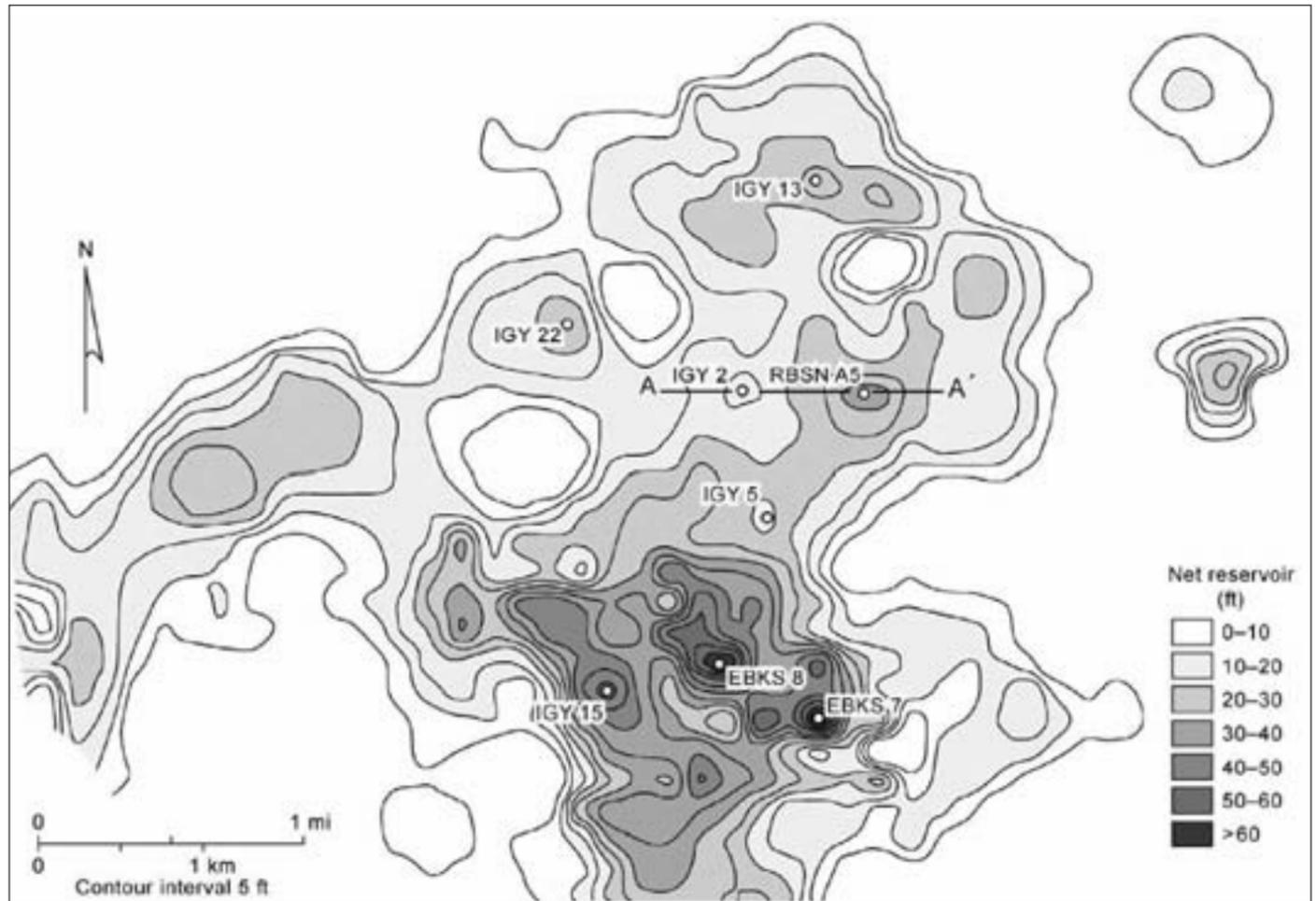
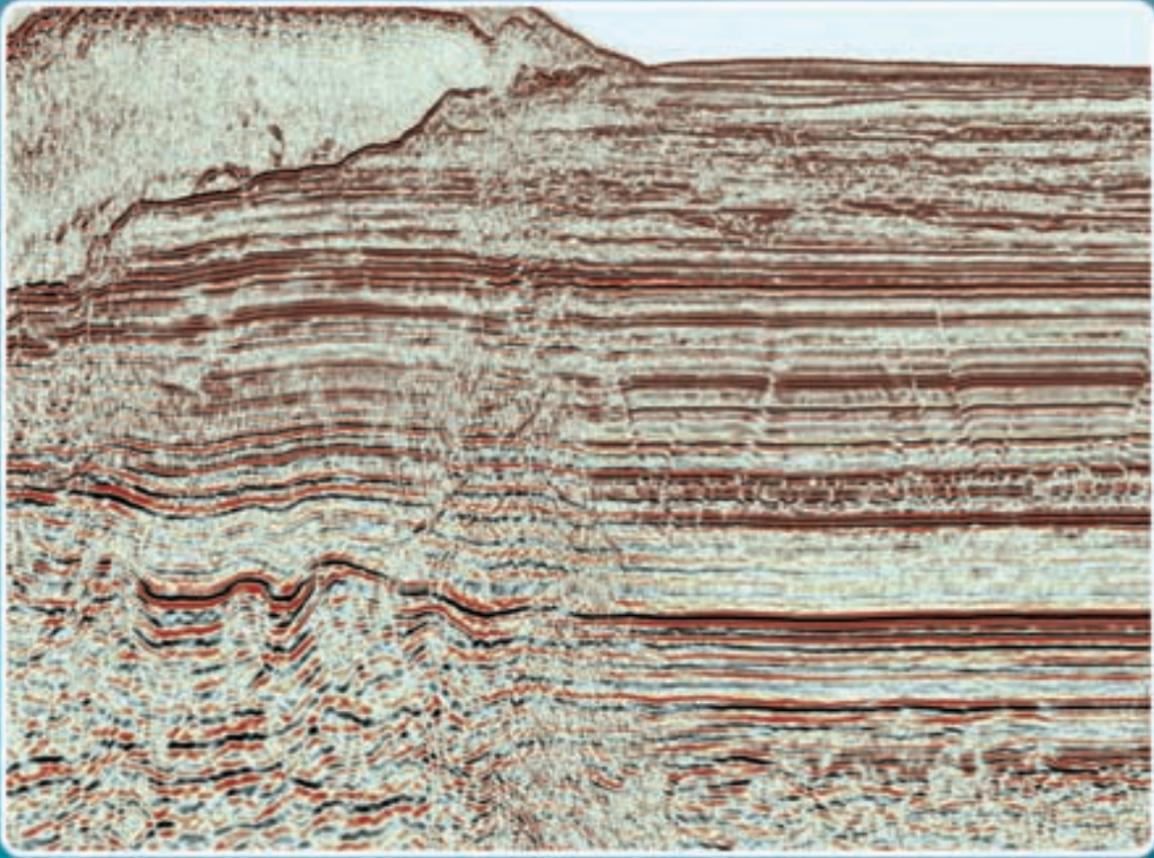


Figure 1 – Net thickness of a Caddo sandstone defined by well logs from numerous wells across a small area of the Fort Worth Basin. Locations of only a few wells of particular interest in a research study are labeled.

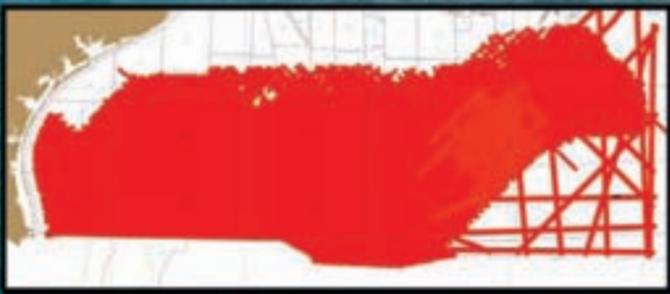
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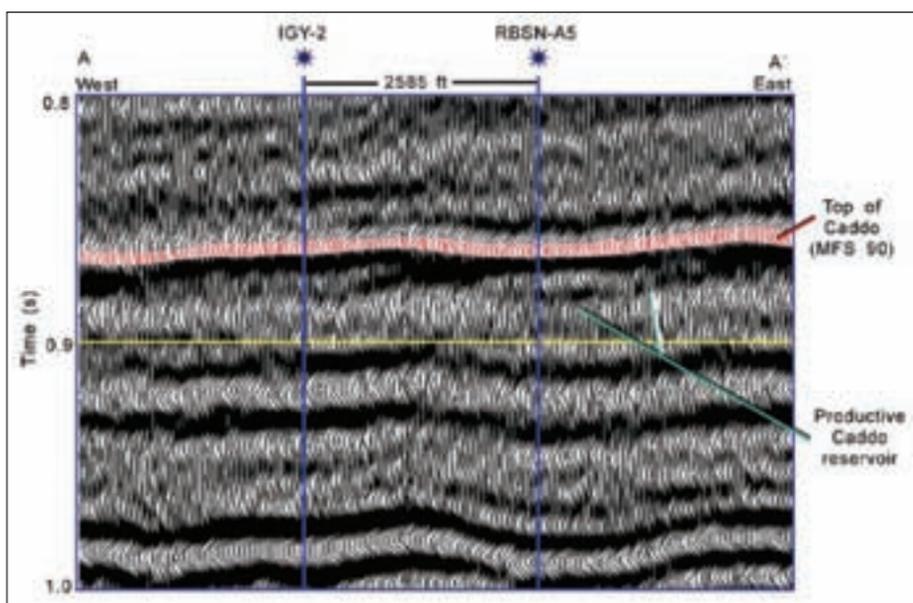


Figure 2 – Seismic section along profile AA' labeled in figure 1 that identifies the unique reflection response of the Caddo sandstone.

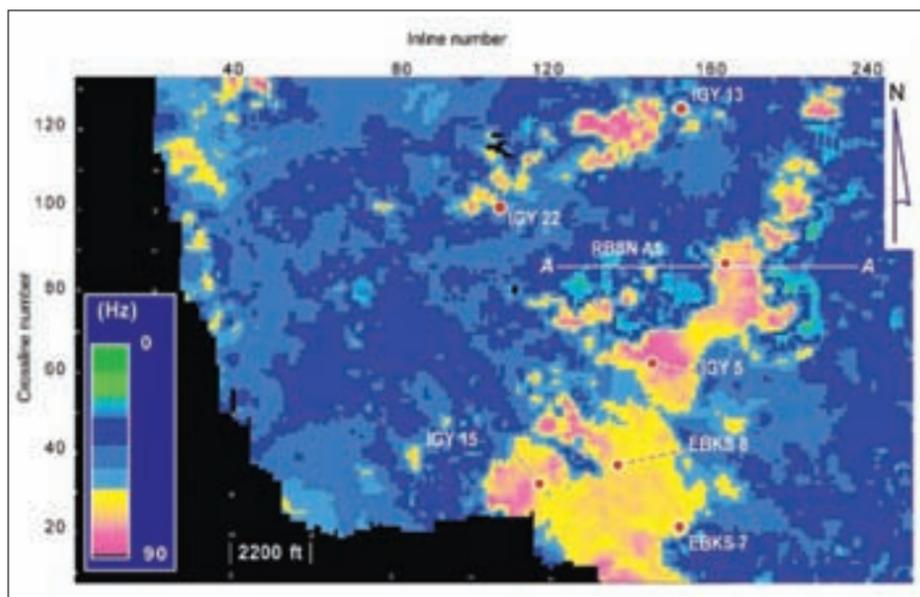


Figure 3 – Map of average instantaneous frequency in a 10-ms window positioned 10 to 20 ms below the Caddo horizon. The trend of 60- to 75-Hz average-frequency attributes on this map is a close approximation to the log-based map in figure 1 and identifies both new drilling locations and locations to avoid.

continued from previous page

the author, tend to focus on amplitude-based attributes as they search a 3-D seismic volume for geologic information. However, phase-based and frequency-based attributes are valuable for depicting subtle targets in many instances.

This article illustrates an application in which instantaneous frequency was used to define a stratigraphic trend of a productive thin-bed sandstone.

* * *

The net-sand-thickness map in figure 1 illustrates the distribution of a productive Caddo sandstone in the Bend Conglomerate interval of the Fort Worth Basin.

Considerable contour detail is shown on the map because reservoir thickness was defined from logs acquired in about 30 wells across the mapped area. Only a few of these well locations are labeled on the figure.

A vertical seismic section along profile AA' is shown in figure 2. The labeled feature shows the reflection character across the thin-bed sandstone and illustrates that the sandstone target is stratigraphically trapped and is not a structural feature.

Several seismic attributes were calculated and analyzed in an attempt to follow the trend of this productive

Caddo target through 3-D seismic image space. Of all the attributes that responded to the presence of this thin-bed unit, the attribute that produced the optimal stratigraphic trap image was instantaneous frequency.

For example, the instantaneous-frequency map in figure 3 is a close match to the log-based map in figure 1 because:

- ✓ The frequency of the reflection signal reacts to the presence of this thin-bed unit.

- ✓ An appropriate color bar is used to display this frequency behavior.

Selection of the color bar used to display a seismic attribute is often the key to attribute interpretation. The correspondence between a seismic attribute value and a targeted geologic condition can be enhanced by the proper choice of color bar that displays the attribute – and, unfortunately, attribute-to-geology relationships can be obliterated by a poor choice of color bar.

Some interpreters justifiably take as much time creating an appropriate color bar for attribute maps as they do creating the attribute that is being mapped.

* * *

The fundamental message from this example is that frequency-based attributes at times can be ideal indicators of stratigraphic-trap conditions. □



Call for Papers

For its 78th Annual Meeting in 2008, the SEG will head to Las Vegas for the first time since 1983. Do not miss this opportunity to present your case histories, latest techniques, and/or research results to your geoscience colleagues assembled from around the world.

Technical Program Chairman Tracy Stark and his committee officially invite you to submit expanded abstracts for oral or poster presentations at the 78th Annual SEG Meeting and Exposition. Contributions from all geophysical disciplines and from all parts of the world are desired. High-quality contributions, particularly those concerning case histories, new techniques, new uses of old techniques, or submissions to special sessions will receive preferential consideration.

It is the intent of the technical committee to accept only the best contributions in each portion of the discipline spectrum and to limit the number of concurrent technical sessions. Submissions must contain relevant technical information, have good-quality graphics, be written in easily understandable English, and conform to standard SEG formats. Please note that submissions received after the deadline, with deliberate commercialism, unclear text or figures, or formatting problems may be rejected.

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WASHINGTONwatch

Energy Bill and Funding Recapped

By DAVID CURTISS
GEO-DC Director

The first session of the 110th Congress finished in December with few results. Partisan squabbling and the distraction of a presidential election cycle seemed to bring the legislative process to a halt.

Voters took note and registered their displeasure by handing Congress approval ratings even lower than the president's. That got their attention.

So as lawmakers returned to Washington, D.C., after the Thanksgiving holiday – with oil prices at record levels and 11 of 12 appropriations bills unfinished – they decided to work on energy and appropriations, hoping to achieve something before Christmas.

And in fact, they did.

Energy Independence And Security Act of 2007

Congress has a habit of choosing titles for bills that promise more than any piece of legislation could ever deliver, such as the Energy Independence and Security Act of 2007. The odds are slim that this law will deliver either energy independence or energy security.

Even so, it does contain several provisions that could move the nation toward those goals.

Energy efficiency measures are a major part of the bill. It requires significant improvements in vehicle fuel economy by increasing the Corporate Average Fuel Economy to at least 35 miles per gallon between 2011 and 2020.

Electric appliances and light bulbs must



Curtiss

use less energy. The bill requires increased energy efficiency in industry and buildings, including federal buildings, and encourages broad scale energy efficiency improvements in federal government operations.

In addition to increased efficiency standards, this bill mandates large increases in renewable biofuel production, ramping up to 36 billion gallons by 2022.

Initially, much of this fuel will be derived from corn (i.e., maize). There are, however, provisions to boost biofuel production from non-corn sources and generate biomass-based diesel by 2022.

There are several accelerated development programs for renewable energy sources in the bill, including geothermal energy. The bill directs the Department of Energy (DOE) to conduct geothermal R&D on a broad array of geothermal systems, including the recovery of geothermal energy in oil and gas fields, and from geo-pressured resources.

The bill further directs the U.S. Geological Survey to conduct a national assessment of geothermal resources.

Carbon capture and sequestration (CCS) also received strong support. The bill directs DOE to conduct R&D and large-scale demonstration projects. It includes provisions for the National Academies to conduct a work force study for CCS and directs the USGS to conduct a national assessment of carbon storage capacity.

The final bill does not include major tax

revisions included in the House version – but it does revise the Internal Revenue Code to extend the amortization term from five to seven years for geological and geophysical expenditures incurred by certain major integrated oil companies as defined in the code.

Fiscal Year 2008 Appropriations

One thing Congress has to do annually is pass appropriations for federal spending in the coming fiscal year. The federal fiscal year runs from October 1 to September 30. Thus, ideally, Congress finishes its appropriations process by September 30.

Reality rarely matches the ideal.

This year the first of 12 appropriations bills was signed into law in mid-November.

See **Washington**, page 42

AAPG Prepares Response to SEC Request

The AAPG Executive Committee has approved a response to the Security Exchange Commission's Concept Release on possible revision to the disclosure requirement relating to oil and gas reserves (February 2008 EXPLORER).

The disclosure rule, first released in 1978, has drawn concern that the current requirements do not reflect the technological and investment realities of today's market place.

The approved response was composed by an ad hoc committee

chaired by past AAPG president Peter R. Rose that included Ken Mallon, Rusty Riese, John Ritter, Dan Tearpock, Creties Jenkins and Don Juckett.

All the committee members were involved in a June 2007 International Multidisciplinary Conference on Oil and Gas Reserves and Resources held in Washington, D.C., sponsored by AAPG and the Society of Petroleum Engineers with support of the World Petroleum Council, the Society of Petroleum Evaluation Engineers and the United Nations Economic Commission for

Europe.

The SEC had requested specific comments to 15 questions.

"Based on public input, we expect that the SEC will develop a formal rule proposal, outlining the provisions of a new rule," said GEO-DC director David Curtiss.

This final rule will be available for public comment and will be voted on by the Commission. If approved it will become part of SEC's formal rules.

For the AAPG comments see the GEO-DC area of the AAPG Web site. □



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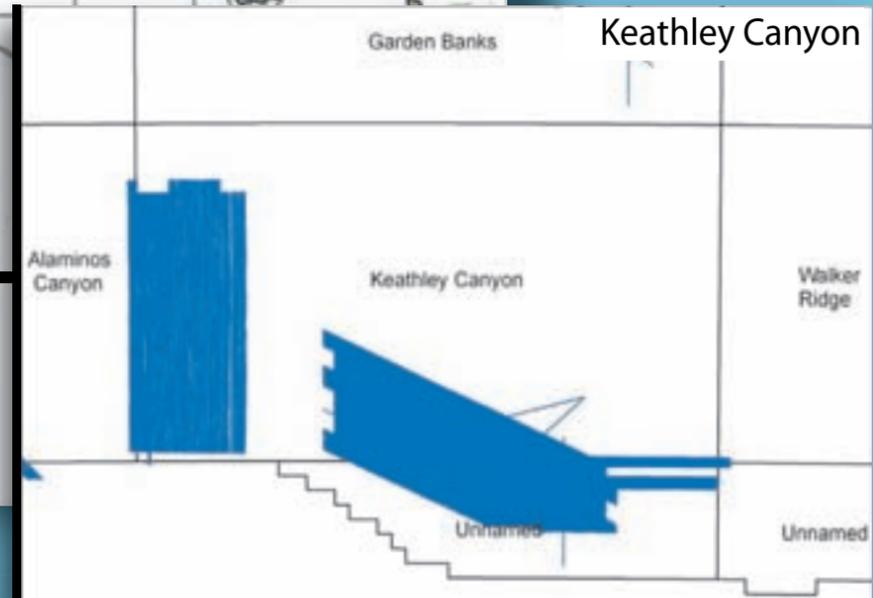
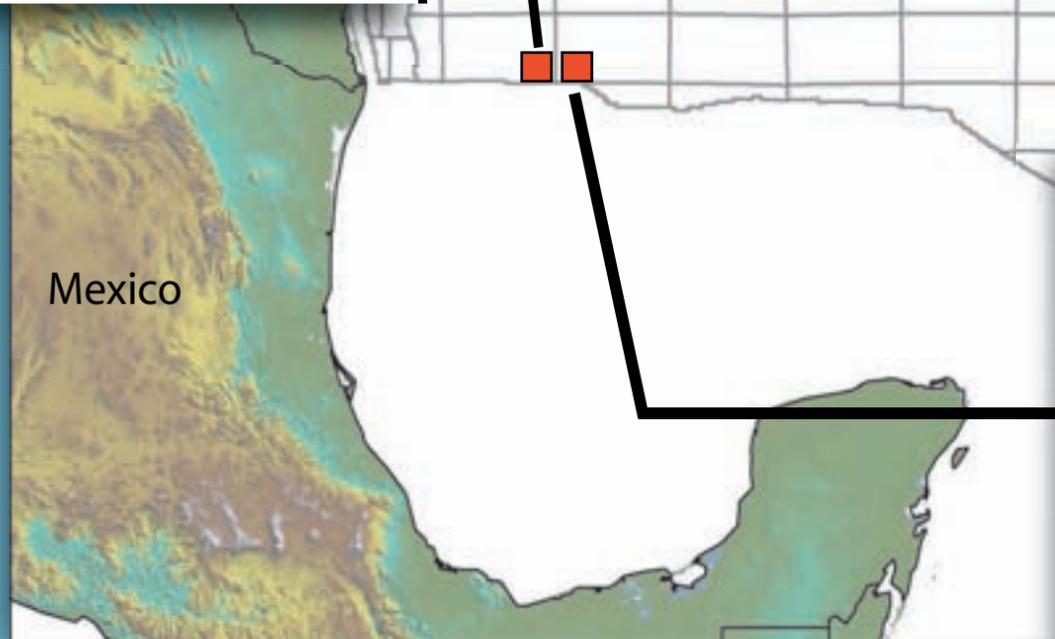
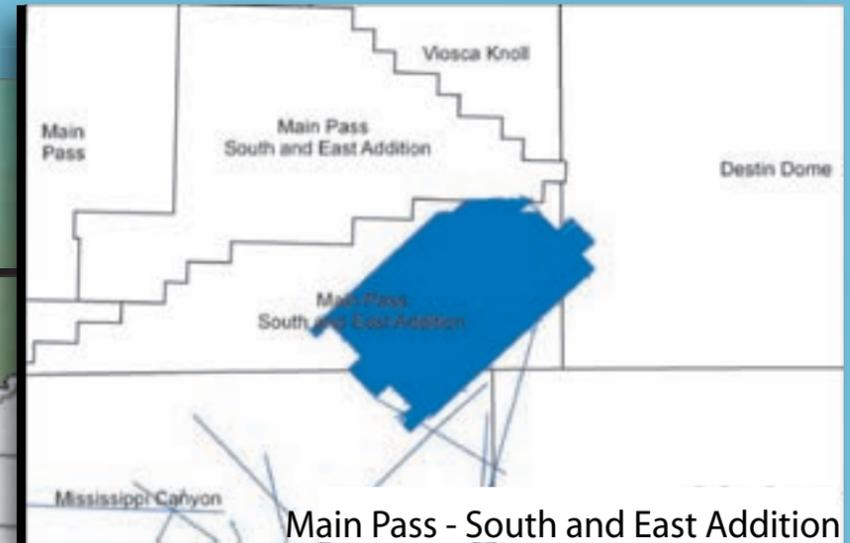
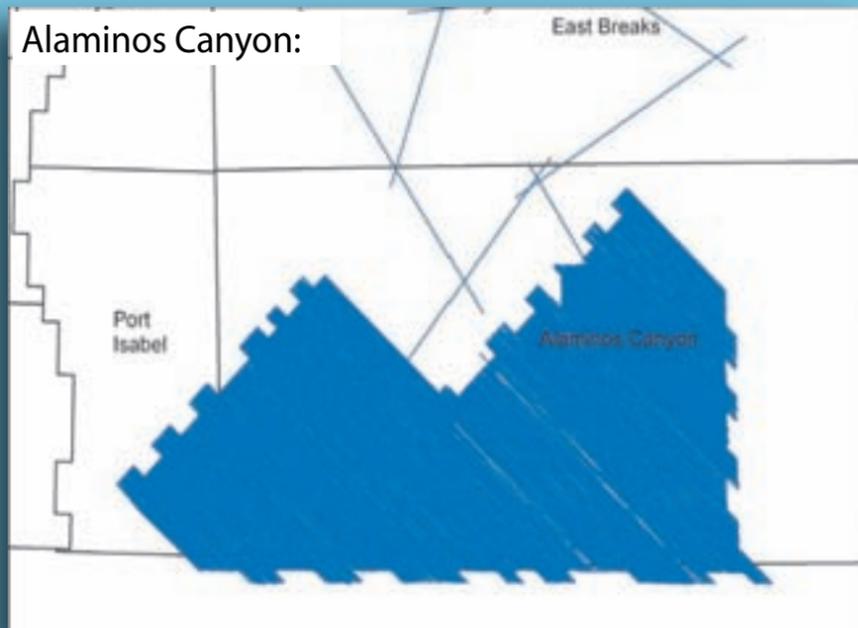
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Agenda Portends Busy Session

By ALLYSON ANDERSON

With the recent passage of the historic Energy Independence and Security Act of 2007, one might think the Congress does not have much more to tackle in the second session of the 110th Congress.

That is exactly what I thought when I reported in to work after the holiday recess in January – that we, the energy committee staff, had worked very hard in 2007 and were due for some down time.

I couldn't have been more incorrect. The first topic to take center stage in 2008 was the discussion around passing a carbon reduction climate bill. The Environment and Public Works Committee reported out a controversial cap and trade carbon emissions reduction bill from



Allyson

their committee late in 2007.

It is quite possible that this bill will be debated on the floor of the Senate as early as April.

A major event that has been evolving over the past several months was the announcement of the "restructuring" of

FutureGen, the near-zero emission coal project. The program is commonly cited as being one of the cornerstone programs of the DOE's coal research program and one of President Bush's

premier energy initiatives.

The announcement of that cancellation has created a flurry of congressional activity, primarily from the Illinois Congressional delegation. The FutureGen Alliance announced that Illinois would receive the project, and within days of that announcement the Department of Energy headquarters announced that the program would be restructured.

The topic has been brought up at two recent hearings and likely will be a subject of much consternation in the coming months until the program design is resolved.

Carbon capture and storage continues to be a key issue as one possible solution for continued coal usage. With much

attention focused on reducing carbon dioxide emissions while continuing to develop our abundant coal resources, this topic will be a top agenda item throughout this year and beyond.

In the president's State of the Union address he identified the need for carbon solutions and cited continued commitment to CCS deployment.

Other areas of continued interest include a host of important topics, including:

- ✓ High energy prices.
- ✓ American competitiveness (the America COMPETES Act).
- ✓ Economic incentives for implementing advanced energy technologies.
- ✓ Strategic energy security.
- ✓ The Agricultural bill.
- ✓ Energy infrastructure.

These are among many areas for possible oversight and/or legislation, but as the year unfolds, I suspect there will be many other surprises that will keep Congressional staff busy into the wee hours of the night. □

(Editor's note: Allyson Anderson is an AAPG member and a staff member of the U.S. Senate Committee on Energy and Natural Resources in Washington, D.C.)

Washington

from page 40

The others were rolled into a massive "omnibus" bill and signed into law by the president the day after Christmas.

The omnibus bill contained support for several programs of interest to AAPG members. For example:

- ✓ The DOE's petroleum-oil technologies program received \$5 million. The administration had sought to terminate this program.
- ✓ The natural gas technologies program received \$20 million, much of that to fund methane hydrates research. The administration had sought to terminate this program, too.
- ✓ The ultra-deepwater and unconventional onshore natural gas and other petroleum research and development program created by the Energy Policy Act of 2005 continues at a level of \$50 million. These funds are not appropriated, but rather come directly from the U.S. Treasury.
- ✓ Carbon sequestration received a strong boost with funding at \$120 million.
- ✓ The USGS received full funding for its mineral resources programs. Among other things, this program conducts the world petroleum assessments widely used in the industry.

The program faced significant cuts in the president's budget, but both the House and Senate affirmed strong support for the work of the USGS mineral resources program.

✓ DOE's geothermal technologies program faced elimination in the president's budget, but Congress provided funding at \$20 million.

Having just finished FY2008 appropriations, it is hard to believe that the appropriations season for FY2009 is already under way – it began Feb. 4, with the president's budget release.

Here we go again. □

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

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*Potential Supply of Natural Gas in the U.S., Golden, CO, Sept. 2007; Canadian Potential Gas Agency, Dec. 2006

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*U.S. Dept. of Energy, EIA, Oct. 31, 2007; "Natural Gas Consumption by End Use" Nov. 6, 2007



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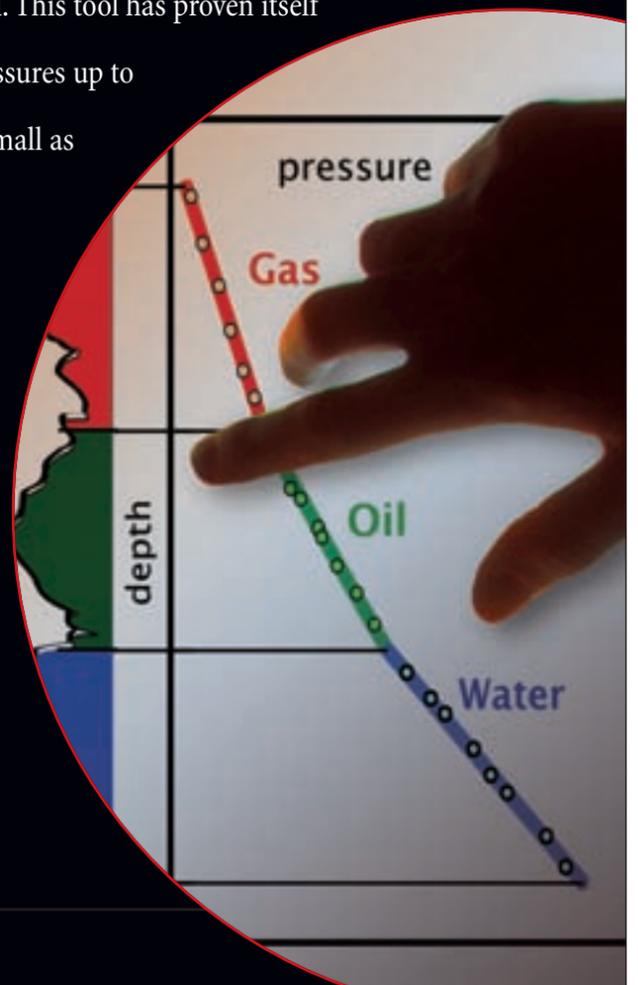
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76 Workshops Set For PTTC Schedule

The newly constituted Petroleum Technology Transfer Council is off and running with up to 76 workshops planned this year through September.

Initiated in 1994 and funded primarily by the U.S. Department of Energy with funds matched by the states and industry, PTTC has been a recognized force for transferring exploration and production technology to the domestic U.S. producer.

PTTC was geared for industry funding at the rate of US \$2-4 million per year; however, industry funding did not

materialize due to low product prices, so the DOE continued funding until recent cuts.

Recognizing the value of PTTC activities to the industry and profession, AAPG assumed management responsibilities in October 2007.

In early February, the first full PTTC board meeting was held, the new bylaws were approved and the board installed.

Voting members are:

□ **Gene Ames III**, independent, San Antonio, AAPG member.

Ames, current general chair of the AAPG Annual Convention in San Antonio and a past PTTC chairman, agreed to continue in the role of PTTC chairman.

□ **Fletcher Lewis**, consultant/producer, Oklahoma City, SPE and AAPG member, and chairman of the PTTC Mid-Continent Producer Advisory Group (PAG).

□ **Tom Williams**, retired from Noble Drilling as vice president-technology, and Texas Gulf Coast member of Texas PAG; SPE member.

□ **Chris Hall**, producer, Torrance, Calif. Hall has been longtime active in PTTC and is currently chair of the West Coast Region PAG for PTTC; SPE member.

□ **Terry Hollrah**, independent, Oklahoma City; AAPG member.

□ **Barry H. (Nick) Tew**, Alabama state geologist and oil and gas supervisor; AAPG member.

□ **Randi S. Martinsen**, University of Wyoming and current AAPG treasurer.

A non-voting board member is **Rick Fritz**, AAPG executive director, Tulsa.

Lance Cole, who has been with PTTC since 1996, was appointed PTTC operations manager; **David Lange**, AAPG business director, was named treasurer; and **Kathy Chapman**, of the PTTC staff, was named secretary.

"Budgets were approved for both headquarters and, more importantly, for the Regional Lead Organizations (RLO) to operate for the remainder of this fiscal year," said AAPG Geosciences Director Jim Blankenship, who has piloted the formation of the new AAPG/PTTC relationship.

"This is operating for the most part under DOE transition funds," he said. "However, new fundraising efforts will continue."

The 76 workshops that will receive funding will be managed by the RLOs, which develop the sessions and are managed through universities and state surveys or bureaus.

Each RLO is advised by a regional Producer Advisory Group, comprising local producers and others involved in the E&P industry.

The board also approved funding for a new RLO in California.

Meanwhile, the board also received favorable results of some recent workshops, including a well-attended course on "The Role of Fractures in Devonian Gas Shale Plays" in West Virginia and a Rocky Mountain workshop on "Putting It All Together, Optimizing Fracture Design."

For PTTC course offerings, see www.pttc.org or connect from the AAPG Web site at www.aapg.org. □

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Ahead of the Curve™



Photo courtesy of Chevron

Chevron is now an award-winning supporter of the Global Fund's fight against tuberculosis, malaria and AIDS.

MAKING a difference

Noble 'Investment' Tackles Scourges

By **BARRY FRIEDMAN**
EXPLORER Correspondent
Chevron Corporation is investing \$30 million in something its chairman, Dave O'Reilly, says, makes "clear business sense" for the company.
And it's not an investment in educational or university geology programs, lobbying efforts, long-term financial commitments to machinery or manpower, or even money earmarked for environmental issues or clean energy.



It is something more basic. It's the fight against TB, malaria and AIDS. As such, Chevron is working with The Global Fund, an organization

that finds innovative ways for multinational corporations, like Chevron, to invest in the fight against the world's diseases. The partnership has been so successful that Chevron has been named the inaugural Corporate Champion by the fund.

"These diseases are a humanitarian issue, an economic issue, a political issue and a business issue," said Chevron spokesperson Alexander Yelland.

And it's an issue that the company believes affects not only the communities in which it operates, but also the company's own bottom line.

Yelland says Chevron is convinced those diseases, along with other scourges around the world, "pose a significant threat to our people and our operations across the globe – particularly in the developing nations that are important to the company's continued growth and success."

Taking Care of Business

The Global Fund was created to finance the fight against AIDS, tuberculosis and malaria – diseases that kill over six million people each year, and the numbers are growing.

To date, the fund has committed \$10 billion in 136 countries to support aggressive interventions against all three – and has done so by coordinating the efforts of many multi-national corporations.

Additionally, the fund, according to the Los Angeles Times, has guided the strategies of the newly established Bill and Melinda Gates Foundation and international investments through the GAVI Alliance, which provides support for vaccination programs in least-developed countries.

Yelland says the connection between the debilitating effects of these diseases and Chevron's overall business model and efficacy is clear.

"Typically striking people between the ages of 20 and 40, HIV/AIDS threatens the sustainability of our work force by attacking one of the most productive segments of society," Yelland said. "Therefore with more than 58,000 employees, and business operations in 180 countries, fighting diseases like HIV/AIDS, TB and Malaria makes clear business sense."

Chevron, obviously, gets good press for doing so, but Yelland says that Global Fund is the kind of organization with which Chevron felt most comfortable because it is where the company could do the most good.

In short, it was a smart business move.

Valuable Partnerships

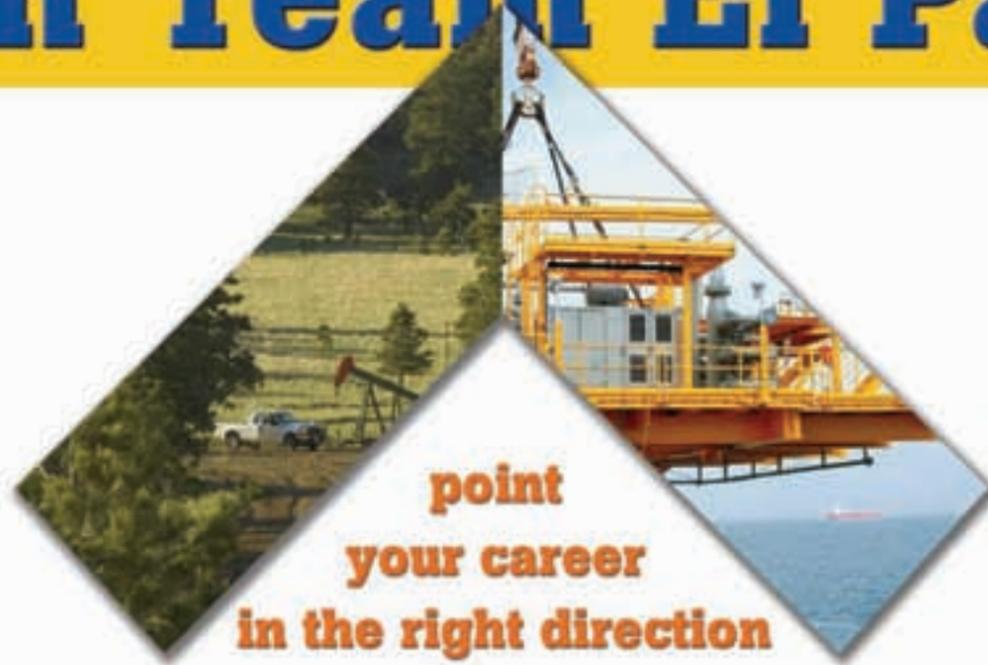
But there was something else, too, about Global Fund that attracted Chevron – one that will not come as a surprise.

"It (Global Fund) has a sound and proven funding process that ensures strong governance and capital



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Students from the Universidad Industrial de Santander at the Colombian conference.

REGIONS§ions

Enthusiasm Shared At Colombia Meeting

(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.)

By CAROL MCGOWEN
Regions and Sections Manager
"Colombia is open for business!"

This unmistakable message permeated every aspect of the recent Colombian Oil & Gas Investment Conference and the Conventional and Unconventional Hydrocarbon Resources International Congress.

The back-to-back week-long event in early February, organized and hosted by the Agencia Nacional de Hidrocarburos (ANH) and the Colombian Association of Petroleum Geologists and Geophysicists, combined both commercial and technical programs.

Professional societies supporting the conference included AAPG, along with USGS, SEG, EAGE and the Latin American Geophysical Union (ULG).

The conference benefited from strong governmental and corporate support plus strong university and student involvement – over 1,800 attendees came from over 28 countries worldwide.

✓ Strong government support.

The III Colombian Oil and Gas Investment Conference opened with remarks provided by Hernan Martinex, minister of Mines and Energy; Joaco Berrio, governor, Department of Bolivar; and Armando Zamora, director general of ANH. Simultaneous workshops offered the latest perspectives on heavy oil, coal bed methane, gas and management of the operations environment.

The conference highlight was the launching of Colombian Round 2008, opening 43 blocks of acreage in four Colombian basins for foreign investment.

Zamora encouraged "investment with confidence" by assuring that perceptions of doing business in Colombia, especially in the area of security, are delayed when compared to reality.

An appearance and presentation by Republic of Colombia President Alvaro Uribe Velez marked the closing of the investment conference and opening of the Conventional and Unconventional Hydrocarbon Resources International Congress.

Uribe Velez's intelligent and extemporaneous remarks emphasized the country's desire to convey an atmosphere of confidence, trustworthiness and respect for human rights. He described the "macro-economic healing of the Colombian economy" and a desire to "connect the Colombian economy with the world economy."

✓ Strong corporate support.

Over 50 companies from around the world supported and attended the conference as sponsors, exhibitors, technical presenters or attendees – a clear demonstration of recent interest in Colombia and its economic potential.

✓ Strong university involvement.

Over 130 students from six Colombian universities participated along with students and faculty from universities in Mexico, Puerto Rico and Argentina.

The technical program included basin prospectivity talks given by the Universidad de Caldas, Universidad Nacional and Universidad Industrial de Santander, from among Colombia's six universities offering geoscience degree programs.

In addition, nearly 20 geoscience students served an indispensable role assisting with conference logistics, along

See **Cartagena**, page 50



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AAPG Bulletin
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 Ardmore Geological Society
 Canadian Society of Petroleum Geologists
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 Fort Worth Geological Society
 Gulf Coast Association of Geological Societies
 Houston Geological Society Bulletin
 Houston Geological Society Special Publications
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 Kansas Geological Society
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- **Deepwater Reservoirs: An Integrated Course and Field Seminar**
- October 6-10, 2008
- Tabernas and Sorbas Basins, Spain
- \$2,950.00 per person
- Includes tuition, guidebook, ground transport, some meals

Chevron

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stewardship," Yelland said. "The strength of Global Fund is its partnership model that encourages participation between communities, government, civil society and businesses. This approach helps develop needs-based sustainable programs that engage the local community and have a measurable impact."

For its part, Global Fund, which has attracted such luminaries as Bill Clinton and Bono in its efforts, believes these corporate champions can achieve much by lending their management skills and business infrastructure to the development and national strategies in the fight against these diseases.

"Global Fund was looking for corporate

partners with a demonstrable track record and a history of engagement to develop their Corporate Champions Program," said former Ambassador Richard Holbrooke, Global Business Coalition president and CEO, "and given the natural fit of our strategies it made perfect sense."

"The Chevron-Global Fund partnership," Holbrooke added, "will enhance already strong programs in hard-hit regions, strengthen local communities and bring Chevron's business skills and human resources to bear on some of the most daunting challenges of our time."

'A Strategic Stake'

Since its creation in 2002, The Global Fund has coordinated over 20 percent of all international corporate financing for AIDS research and approximately two-thirds of that for TB and malaria, so it has experience in pulling off these partnerships.

Most importantly, millions of people have been treated and helped by the program, including those who have benefited from some of the Fund's less "glamorous" endeavors, like the purchase of almost 50 million insecticide-treated bed nets that have helped prevent the spread of malaria.

Global Fund's programs are designed as an integrated platform for public-private partnerships, giving corporations the opportunities to make a substantial contribution to world health and to know that its donations will be used in an effective and efficient way.

Yelland sees that as a good fit.

"Our global HIV/AIDS policy is founded on a decade of best practice developed from our operations in countries such as Angola, Nigeria and South Africa," Yelland said. "The policy was developed in conjunction with independent experts and agencies, such as the United Nations Development Program and Pangea Global AIDS Foundation. We have had a long-term commitment to fight AIDS/HIV and malaria."

"We have a strategic stake in the fight." □



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Cartagena

from page 48

with three students from Universidad Industrial de Santander who gave their time to assist in the AAPG booth.

AAPG was represented at the conference by several members, including Latin American Region President Nilo Azambuja; luncheon speaker G. Warfield "Skip" Hobbs; AAPG Technical Program Committee chair Pinar Yilmaz; and Carol McGowen, AAPG Sections and Regions manager.

Hobbs delivered the keynote luncheon speech in Spanish on "The Future of the Global Oil Industry: Resources, Challenges and the Geoscience Work Force," and also joined others on a panel discussion of "Exploratory and Technical Perspectives in Latin America."

An evening student reception hosted by AAPG resulted in over 100 new AAPG student members, renewed relationships with existing AAPG student chapters and their faculty advisers, and sparked interest in starting new AAPG student chapters.

The warmth and generous hospitality of the Colombian people, along with many invitations for future collaboration with AAPG from the local societies, leaves no doubt for productive future relationships in AAPG's Latin American Region. □

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SHORT COURSES

Practical Salt Tectonics

Date: May 5-6, 2008
Location: London, England
Instructor: Mark G. Rowan, Consultant, Boulder, CO
<http://www.aapg.org/education/shortcourse/details.cfm?ID=67>

Basic Well Log Analysis

Date: May 13-16, 2008
Locations: Austin, TX
Instructors: George B. Asquith, Texas Tech University, Lubbock, TX; Daniel A. Krygowski, The Discovery Group, Denver, CO
<http://www.aapg.org/education/shortcourse/details.cfm?ID=109>

Essentials of Subsurface Mapping

Date: May 19-20, 2008
Location: Dallas, TX
Instructor: Richard Banks, Scientific Computing Applications, Inc., Tulsa, OK
<http://www.aapg.org/education/shortcourse/details.cfm?ID=29>

Deep-Water Sands - Integrated Stratigraphic Analysis: A Workshop Using Multiple Data Sets

Date: May 26-28, 2008
Location: London, England
Instructor: John M. Armentrout, Cascade Stratigraphics, Damascus, OR
<http://www.aapg.org/education/shortcourse/details.cfm?ID=52>

Reservoir Engineering for Petroleum Geologists

Date: May 28-29, 2008
Location: Houston, TX
Instructor: Richard G. Green, Saxon Oil, Dallas, TX
<http://www.aapg.org/education/shortcourse/details.cfm?ID=71>

Exploring for Stratigraphic Traps Using Pressure/Depth Plots & Salinities

Date: June 2-4, 2008
Location: Denver, CO
Instructor: Hugh Reid, Hugh W. Reid & Associates, Calgary, AB, Canada
<http://www.aapg.org/education/shortcourse/details.cfm?ID=49>

Multi-Component Seismic Stratigraphy

Date: June 11-12, 2008
Location: Houston, TX
Instructor: Bob Hardage, Bureau of Economic Geology, Austin, TX
<http://www.aapg.org/education/shortcourse/details.cfm?ID=42>

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

Date: June 17-20
Location: Denver, CO
Instructor: John Shaw, Harvard University, Cambridge, MA

FIELD SEMINARS

Modern Terrigenous Clastic Depositional Systems

Dates: May 1 - 8; June 14 - 21, 2008
Location: Begins in Columbia and ends in Charleston, South Carolina
Leader: Walter J. Sexton, Athena Technologies, Inc., Columbia, SC
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=6>

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

Date: May 4-7, 2008 (beginning at noon on the 4th, ending late afternoon on the 7th)
Location: La Jolla, San Diego County, California
Leader: John E. Warme, Colorado School of Mines, Golden, CO
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=63>

Controls On Porosity Types and Distribution in Carbonate Reservoirs

Date: May 18-23, 2008
Location: Almeria Region, SE Spain, begins and ends in Las Negras, Spain. Fly from London/Barcelona/Madrid
Leaders: Evan K. Franseen, Kansas Geological Survey, Lawrence, KS; Robert H. Goldstein, University of Kansas, Lawrence, KS; Mateu Esteban, REPSOL-YPF, Mallorca, Spain
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=2>

Complex Carbonate Reservoirs: The Role of Fracturing, Facies and Tectonics

Date: May 24-30, 2008 (begins the afternoon of May 24 and finishes the afternoon of May 30)
Location: Begins in Naples and ends at Rome International Airport (Italy)
Leaders: Raffaele Di Cuia, G.E. Plan Consulting, Ferrara, Italy; Davide Casabianca, BP plc, Aberdeen, UK
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=79>

GEOTOUR! Geological Tour Through Alaska: A Trans-Alaskan Transect - Gulf of Alaska to Prudhoe Bay on the Arctic Ocean

Date: May 31 - June 10, 2008
Location: Trip begins in Homer and ends in Fairbanks, Alaska
Leaders: Tom Plawman, BP, Anchorage, AK, and David Hite, Consultant, Anchorage, AK, for south-central Alaskan segment; Gil Mull, Santa Fe, N.M., Tom Plawman and David Hite for Brooks Range and northern Alaska segment
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=113>

Predicting Clastic Reservoirs Using Applied Sequence Stratigraphy

Date: June 7-14, 2008
Location: Begins and ends in Salt Lake City, UT
Leaders: Lee F. Krystinik, Fossil Creek Resources, Fort Worth, TX and Beverly Blakeney De-Jarnett, Bureau of Economic Geology, The University of Texas, Houston, TX
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=11>

Folding, Thrusting & Syntectonic Sedimentation: Perspectives from Classic Localities of the Central Pyrenees

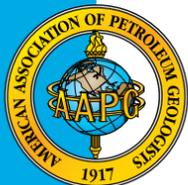
Date: June 16-20, 2008
Location: Begins and ends in Barcelona, Spain
Leaders: Antonio Teixell, Universitat Autònoma de Barcelona, Spain, and Antonio Barnolas, Instituto Geológico y Minero de España, Madrid, Spain
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=24>

Sequence Stratigraphy and Reservoir Distribution in a Modern Carbonate Platform, Bahamas

Date: June 16-20, 2008
Location: Begins and ends in Miami, Florida. Four days are spent on a chartered boat in the Bahamas.
Leaders: Gregor P. Eberli, Comparative Sedimentology Laboratory, University of Miami, Miami, FL; G. Michael Grammer, Department of Geosciences, Western Michigan University, Kalamazoo, MI; Paul M. (Mitch) Harris, Chevron Energy Technology Company, San Ramon, CA
<http://www.aapg.org/education/fieldseminars/details.cfm?ID=4>



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AAPG 2008 Annual Convention and Exhibition

April 20-23
San Antonio, Texas

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Still Time to Save on SA

There's a good way for you to save up to \$120 on your registration fee for this year's AAPG Annual Convention.

All you have to do is register by April 1 – the last time reduced fees will be available for this year's meeting.

Registering is as easy as going to the AAPG Web site, where you can register online in a matter of minutes. Once you complete your registration link you can go directly to the housing site to make a hotel registration.

Not sure if you're attending the meeting, you say?

Cancellations and refunds are available through March 20. In other words – you have little to lose by registering now.

This year's convention will be held April 20-23 at the Henry B. Gonzalez Convention Center.

The meeting's theme is "Deliver the Conventional; Pursue the

Unconventional," which will be covered by 100-plus technical sessions, nine special forums, 25-plus field trips and short courses, a variety of luncheons and career-building opportunities.

Complementing the technical program will be an exhibition hall filled with more than 200 companies displaying the latest in technology and information.

And adding to the excitement of this year's meeting will be San Antonio's famous "Fiesta" celebration, which will be going on during the AAPG meeting and promises to turn the entire city into a colorful celebration.

Complete information can be found in the official announcement that was mailed with the January EXPLORER, and is available online at www.aapg.org.

Remember, the clock is ticking – don't put off registering until the last minute. Register before April 1 and save up to \$120. □

Cape Town Program Advances

The abstracts are in hand and the final technical program for this year's AAPG International Conference and Exhibition is being finalized for posting within the next several weeks.

More than 700 abstracts were received for this year's conference, to be held Oct. 26-29 in Cape Town, South Africa.

This year's theme is "African Energy – Global Impact."

Organizers expect the technical program to have more than 70 sessions, all built around "the big five" symbols of Africa's animal kingdom. They are:

✓ The Elephant – A Steady Advance: "Deepwater: Ancient Analogues, Current

Technologies, Future Opportunities."

✓ The Leopard – Unraveling Secrets: "Advances in Geoscience and Allied Disciplines."

✓ The Black Rhino – Turned Around From Near Extinction: "Next Generation Tools and Technologies."

✓ The Lion King – Roar of the Future: "The New Business of Energy."

✓ Cape Buffalo – Beauty and the Beast: "Gondwana and Pangean Petroleum Systems: Exploration, Development and Production – Emerging Plays, Lessons and Analogs."

More information available on line at www.aapg.org/capetown/. □

International Conference On Coal and Organic
Petrology ICCP - TSOP
2008 - Oviedo, SPAIN

International Committee for Coal
and Organic Petrology (ICCP)
The Society for Organic Petrology (TSOP)

**JOINT ANNUAL MEETING ANNOUNCEMENT
AND CALL FOR PAPERS**

Oviedo (Asturias), Spain
September 21-27, 2008

Conference Themes:

Advances in organic petrology and organic geochemistry
Application of organic petrology to coal utilization and coal by-products
Organic petrology in the context of clean coal technologies
Organic petrology and the environment

Field Trip to the Asturian Coast Jurassic section

TECHNICAL PROGRAM AND ABSTRACTS:
Isabel Suárez-Ruiz
E-mail: isruiz@incar.csic.es

GENERAL INQUIRIES AND REGISTRATION:
Begoña Ruiz Bobes
E-mail: begorb@incar.csic.es

ABSTRACT SUBMISSION DEADLINE: APRIL 15, 2008

Meeting and abstract submission details:

http://www.incar.csic.es/iccp_tsop

ICCP: www.iccop.org
TSOP: www.tsop.org

TSOP student research grant
(deadline May 15, 2008)

Meeting organized by Instituto Nacional del Carbón National Council for Scientific Research

Meeting Challenges... **ASSURING SUCCESS**

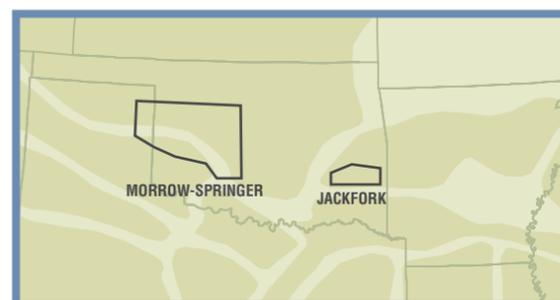
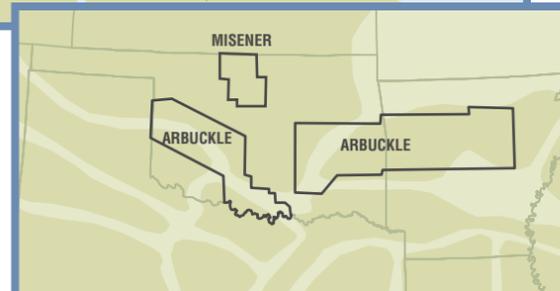
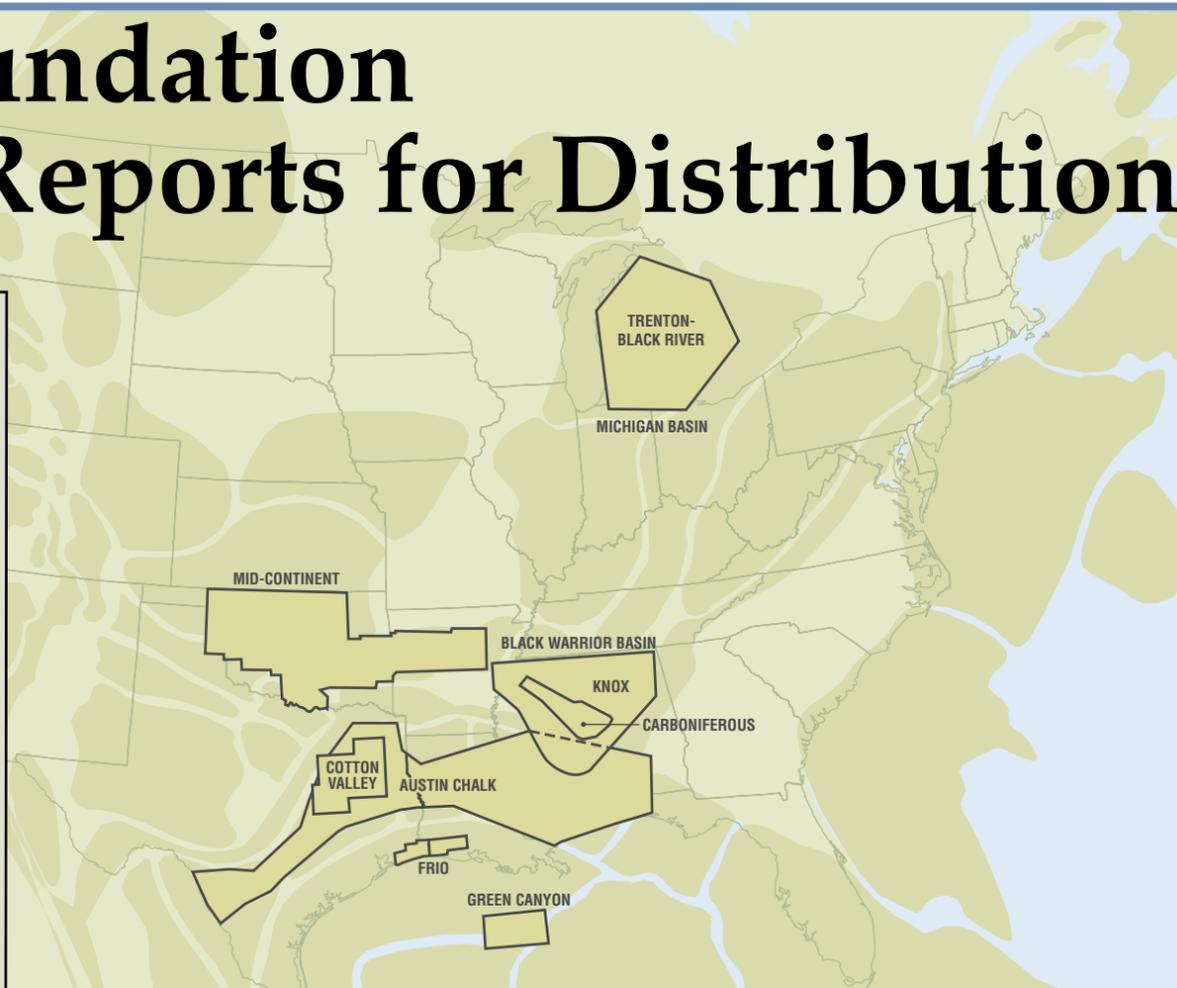
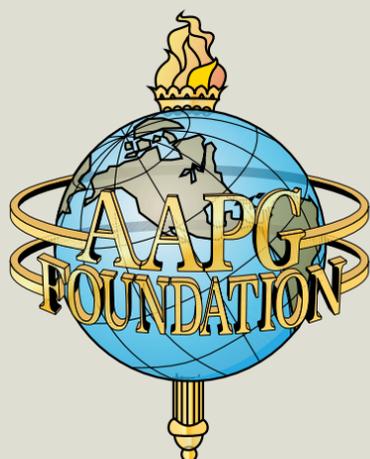
AAPG Foundation Research Reports for Distribution

AAPG Foundation has received from the estate of Paul N. McDaniel and AAPG member Larry Gerken research reports prepared by Masera Corporation. These reports are available for distribution to interested companies or individuals at prices less than 10 percent of the original prices. All proceeds go to the AAPG Foundation.

These domestic reports are almost entirely petro-stratigraphic studies of reservoirs and are regional to sub-regional in scope. Yet, they have detail information, most commonly as core description and/or outcrop description, including petrographic analyses with interpretation of depositional environments and diagenesis. Isopach maps at a scale of 1 inch = 8,000 feet are common elements of the studies. The oldest study was completed in 1983; the most recent, in 1996.

Each report is to be distributed in digital format, generally TIF for oversized maps, cross-sections, and diagrams and PDF for text and page-sized illustrations, including core photographs and photomicrographs.

For additional information and price structure for individual reports, please contact AAPG Foundation library (library@aapg.org; 918-560-2620).



The more regional map (top) shows the areas of the reports. The maps primarily of Oklahoma (above) show the areal extents of the individual Mid-Continent studies. The list of the studies follows:

Mid-Continent

- Red Fork Sandstone, Anadarko Basin and Platform
- Spiro Sandstone, Arkoma Basin
- Morrow-Springer Groups of the Anadarko Basin
- Jackfork Sandstone, Ouachita Mountains
- Misener Sandstone, North-Central Oklahoma
- Hunton Group of Anadarko and Arkoma Basins (3 phases)
- Arbuckle Supergroup, Southern Oklahoma, part of Anadarko Basin, and Arkoma Basin (2 phases)

Michigan Basin

- Trenton-Black River Groups

Black Warrior Basin

- Carboniferous
- Knox Group and Devonian Chert

Gulf Coast Region

- Upper Frio Southwest Louisiana – Southeast Texas (2 phases)
- Austin Chalk, Southeast Texas - Alabama (2 phases)
- Cotton Valley Lime, East Texas

Gulf of Mexico

- Pressure Regimes, Green Canyon area

FOUNDATIONupdate

Foundation (General)

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In memory of Richard Boebel
 Richard S. Bishop
In memory of Amos Salvador and Ed Roy; In honor of John Amoroso and Jim Gibbs
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In memory of Gifford Kessler
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In memory of Amos Salvador
 Miguel Alfredo Quintana
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In memory of Eugene F. Reid
 Carlos Rivero
 James Arnold Seglund
 Earl V. Tessem
In memory of Robert Segar

Awards Fund

Robert Berg

Outstanding Research Award
 Lee Travis Billingsley
 Ernest A. Mancini

Daniel A. Busch Library Fund

Patrick Marion Tolson
In memory of Daniel Busch

Distinguished Lecture Fund

Paul H. Dudley Jr.
In honor of Earl Bescher

New Award Honors Weeks

The AAPG Foundation has established a new award – the Foundation's highest honor – to recognize "extraordinary philanthropy and service directed to advance the mission of the AAPG Foundation."

It is the L. Austin Weeks Memorial Medal, created and named in honor of one of the most generous benefactors of the Association and the scion of an AAPG giant who was himself a generous benefactor to the Foundation and the Association.

And, the first recipient of the honor is **Marta Sutton Weeks**, Austin Weeks' widow, who epitomizes the model of philanthropic endeavors.

She will receive the honor on April 20 in a special presentation at the opening session of the AAPG Annual Convention in San Antonio.

"Although the selection of Marta as the first recipient of the Weeks Medal was clear and obvious to all involved, Marta's first reaction was surprise and a genuine insistence that she did not deserve the recognition," said William L. Fisher, chairman of the Trustees of the AAPG Foundation. "She is as modest as she is generous."

Marta Weeks, who in 2005 with the



Marta and L. Austin Weeks

then- late L. Austin Weeks, as instructed by terms of his will, made a \$10 million unrestricted grant to the Foundation, also has an AAPG Foundation named grant established in her honor.

Together, the Week's family provided funding for the Frederick A. Sutton (Marta's father) Memorial Grant-in-Aid; Marta S. Weeks Grant-in-Aid; L. Austin Weeks Memorial Grant-in-Aid; and the L. Austin Weeks Undergraduate Grant Program for AAPG Student Chapters.

Marta provided funding to establish Digital Products University Subscriptions for the University of Wisconsin, University of Utah, Columbia University, University of Miami and Beloit College. She also made an additional unrestricted gift of \$500,000 in July 2007.

Marta currently serves the Foundation as a Member of the Foundation Corporation, Trustee Associate and Campaign Team Leader.

Executive Director Rick Fritz was pleased at the Board's decision to choose Marta.

"She sets a high standard for future recipients, and her dedication and generosity will benefit many people in the year's to come," Fritz said.

"The Weeks family has left a heritage of philanthropy unparalleled in the history of AAPG that has formed the bedrock for the Association to flourish and propel it into the 21st century," he added.

The late Fred A. Dix, former AAPG executive director and friend of the Weeks family, noted many times that without the Weeks family's generosity the Association would not be the leader for the profession it is today.

Included in the support of AAPG, Lewis Weeks, Austin's father, in the early 1970s provided the money for the headquarters addition in Tulsa that bears his name: the Weeks Tower.

His son, geologist L. Austin Weeks, continued as a major, generous contributor to the AAPG Foundation. □

Grants-In-Aid Fund

Charlyne Dodge
In memory of Thomas Mairs
 Jeffrey A. May

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J. Ben Carsey Sr. Memorial Grant

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John D. "Jack" Edwards Memorial Grant

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continued on next page

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Diversity Seminar Planned During Annual Convention

By CAROL McGOWEN

Regions and Sections Manager

AAPG will offer a special workshop at the Annual Convention in San Antonio designed to heighten awareness and skills for effectively managing diversity in the workplace. Members of AAPG's Professional Women in Earth Science's Committee, Susan Nissen and Sunday Shepherd, will co-chair the event.

"Embracing Diversity in a Global Work Force: How Do We Respond to Age, Gender and Global Cultural Differences?" will be held during the Annual Convention on Tuesday, April 22, 5:15-7:00 p.m.

As anyone who is following the current U.S. presidential race can attest, age, gender, ethnicity and religion are hot topics – and in the petroleum industry it is becoming more common for people of different generations, genders, ethnicities and/or national origins to find themselves working together.

How do we respond to these differences? Do we view cultural differences as a hindrance? Do we see cultural diversity as an opportunity for bringing other viewpoints and insights into our work? How do we adapt?

The seminar will explore these and other questions in an attempt to help participants understand some of the cultural differences we face in the workplace.

The seminar will feature three speakers:

✓ **Tom Roberts**, assistant dean, Recruitment and Leadership Development, College of Engineering, Kansas State University.

✓ **Lee Allison**, state geologist and director of the Arizona Geological Survey.

✓ **Emily Oatney**, an earth scientist with Chevron with a vast experience of

dealing with diverse cultural backgrounds.

Following the presentations, there will be time for questions/answers and informal discussion among the seminar participants.

The seminar is hosted by the AAPG Professional Women in Earth Sciences Committee and the Association for Women Geoscientists. □

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



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MV Geo Celtic

continued from previous page

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Haas-Pratt Distinguished Lecture Fund
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PROFESSIONALnewsbriefs

Allan J. Baxter, to vice president-exploration and development, Glenogle Energy, Calgary, Canada. Previously president, ExAlta Energy, Calgary, Canada.

Bruce J. Bilodeau, to petrophysicist/geologist-formation evaluation services, Chevron Energy Technology, San Ramon, Calif. Previously petrophysicist-ES adviser, Chevron Pacific Indonesia, Duri, Indonesia.

Kim R. Butler, technical expert, Southwestern Energy, Fayetteville, Ark. Previously senior staff geologist, Southwestern Energy, Fayetteville, Ark.

Angel Callejon, to geochemist, Gulf of Mexico regional team, StatoilHydro, Houston. Previously senior geologist, ExxonMobil Exploration, Houston.

Michael F. Conlon, to president and chief operating officer, Yuma Exploration and Production, Houston. Previously vice president-exploration, Yuma Exploration, Houston.

Martin Dubois, to manager/consultant, Improved Hydrocarbon Recovery, Lawrence, Kan. Previously research geologist, Kansas Geological Survey, Lawrence.

Charles F. "Charlie" Garvey, to manager of risk and resource assessment, Noble Energy, Houston. Previously geoscience manager, Noble Energy, Denver.

R.P. "Dick" George, to senior geological adviser, geoscience technology group, Noble Energy,

Houston. Previously geological associate, Middle East regional/database group, ExxonMobil Exploration, Houston.

Paul Hunt, to vice president-exploration, Denali Oil & Gas, Houston. Previously senior geophysical consultant, Denali Oil & Gas, Houston.

Walter Kennedy, to associate geologist, Chesapeake Energy, Oklahoma City. Previously graduate student, University of Texas at Arlington, Arlington, Texas.

Jack Kramberger, to chief geologist, Tauber Exploration and Production, Houston. Previously chief geologist, Nearburg Producing, The Woodlands, Texas.

Tom LaHouse, to geoscience manager, Meridian Resource, Houston. Previously president, Berean Consulting, Houston.

Louis Mazzullo, to president, Mazzullo Energy, Midland, Texas. Previously

senior geologist, Brigham Exploration, Austin, Texas.

John McLeod, to senior geologist, Chesapeake Energy, Oklahoma City. Previously senior geologist, EOG Resources, Oklahoma City.

Thomas R. Moore, chief geoscientist-unconventional plays, North Coast Energy, Cranberry, Pa. Previously exploration manager-Northeast and senior geologist, CDX Gas, Charleston, W.Va.

James C. Peterson, to geological consultant, Orion Energy Partners, Denver. Previously geological adviser, EOG Resources, Denver.

Claudia Rassi, to geoscientist NOJV, Chevron Brasileira, Rio de Janeiro, Brazil. Previously geologist, Chevron, Houston.

Peter Rushworth, to GIS workflow specialist, IHS, Houston. Previously senior GIS analyst, Gulf South Pipeline, Houston.

Hayet Serradji, to associate geologist, Chesapeake Energy, Oklahoma City. Previously graduate student, University of Kansas, Lawrence, Kan.

Leta K. Smith, to director, E&P Trends forum, Cambridge Energy Research Associates, Houston. Previously principal consultant, IHS Consulting, Houston.

Pete Sullivan, to vice president-exploration, Energy Corporation of America, Charleston, W.Va. Previously exploration manager, Energy Corporation of America, Charleston, W.Va.

Mark J. Wojna, exploration manager-eastern Gulf of Mexico, Century Exploration New Orleans, Metairie, La. Previously senior geologist, Century Exploration New Orleans, Metairie, La.

Stuart Wright, to vice president-applied geophysics, Dawson Geophysical, Denver. Previously manager of geophysics, Dawson Geophysical, Denver.

Andrew Zolnai, to consultant, GeoSolveIT, Letherhead, England. Previously consultant, Petris Technology, London, England. □

Ettensohn Wins Eastern Levorsen Award

Frank R. Ettensohn, of Lexington, Ky., has won the A.I. Levorsen Award for presenting the best paper at last year's Eastern Section meeting.

His paper was titled "Horses, Kentucky Bluegrass and the Origin of Upper Ordovician, Trenton-Age



Ettensohn

Carbonate Reservoir and Source Rocks in the East-Central United States."

Ettensohn, a professor in the University of Kentucky's Department of Earth and Environmental Science, will receive his award at the next Eastern Section annual meeting, set Oct. 11-15 in Pittsburgh.

(Editor's note: "Professional News Briefs" includes items about members' career moves and the honors they receive. To be included, please 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, smoore@aapg.org; or submit directly from the AAPG Web site, www.aapg.org/explorer/pnb_forms.cfm.)

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EXPLORER ranks high in survey

Readers Tell What They Like

Every three years, the EXPLORER conducts a survey of the membership to find out what you like to read and how we can improve.

The latest survey was mailed last fall with extensive questionnaires sent to every seventh member gleaned from the membership list.

Of the 4,090 surveys that were mailed, 562 were returned – a 14 percent reply percentage, which is an excellent sampling in the world of survey-takers. The demographic breakdown of responses is remarkably close to the actual AAPG population.

Some of the findings include:

✓ 95 percent rated the EXPLORER “Good” or better; 44 percent rated it “Excellent.”

✓ 75 percent read 50 percent or more of the EXPLORER; 31 percent read 75-100 percent.

✓ 93 percent rated the EXPLORER a “Good,” “Very Good” or “Great” value to their membership; 33 percent rated it “Great.”

✓ 82 percent rated the EXPLORER as “Very Good” or “Excellent” in being easy to read.

The EXPLORER also outscored other publications dramatically on the question “What publications do you actually READ,

not just receive?” With multiple choices available, 78 percent chose the EXPLORER.

The BULLETIN was next with 52 percent. The third “most read” publication was chosen by 35 percent.

Those findings are in line with past readership surveys.

As far as monthly features in the EXPLORER, the following are the Top Five most popular:

- 1 – Professional News Briefs
- 2 – President’s Column
- 3 – Geophysical Corner
- 4 – Readers’ Forum
- 5 – In Memory

The survey findings are used to affirm

features that are popular with the readers and institute changes in response to reader preferences as appropriate.

So what would the readers like to see in the EXPLORER?

The results were clear: More personal interest, travel and history stories – as they relate to geology.

The EXPLORER always wants to know what the reader thinks about us – and you told us.

And, we want to continue to hear from you. For comments – or article ideas, feel free to contact lnation@aapg.org.

From the EXPLORER staff, we thank you.
– LARRY NATION

Once Again, NAPE Sets A Record

The 15th annual North American Prospect Expo (NAPE), held in Houston in early February, followed suit along with the rest of the industry by setting yet another attendance record.

NAPE brings state-of-the-art prospects and properties from the United States and around the world, advanced technology and energy capital formation all together in one location, creating a pure market place to establish strategic alliances for doing business and initiating purchases and trades.

A tally of 15,767 attendees continued the expo’s annual growth trend, topping the 2007 gathering by over 1,000 persons.

There were 958 companies that exhibited in 1,610 booths, with 2,163 companies represented at the meeting.

NAPE is presented by NAPE Expo LP, comprising the American Association of Petroleum Landmen, AAPG, IPAA and SEG.

Watch the April EXPLORER for a report from the meeting.

Registration Open In May



African Energy – Global Impact

Join thousands of top professionals and decision-makers at the AAPG International Conference and Exhibition in Cape Town. Look forward to a wide-ranging global program, world-class field trips, impressive short courses, a dedicated Core Poster Session, extensive exhibits, and enticing guest tours and safaris. Only Africa can offer such an intriguing experience!



Technical Program Themes

- **Theme A: Elephants – A Sturdy Advance**
Deep-water: Ancient Analogues, Current Technologies, Future Opportunities
- **Theme B: Leopard – Unraveling Secrets**
Advances in Geoscience and Allied Disciplines
- **Theme C: Black Rhino – Turned Around from Near Extinction**
Next Generation Tools and Technologies
- **Theme D: Lion King – Roar of the Future**
The New Business of Energy
- **Theme E: Cape Buffalo – Beauty and the Beast**
Gondwana and Pangean Petroleum Systems: Exploration, Development and Production—Emerging Plays, Lessons and Analogs

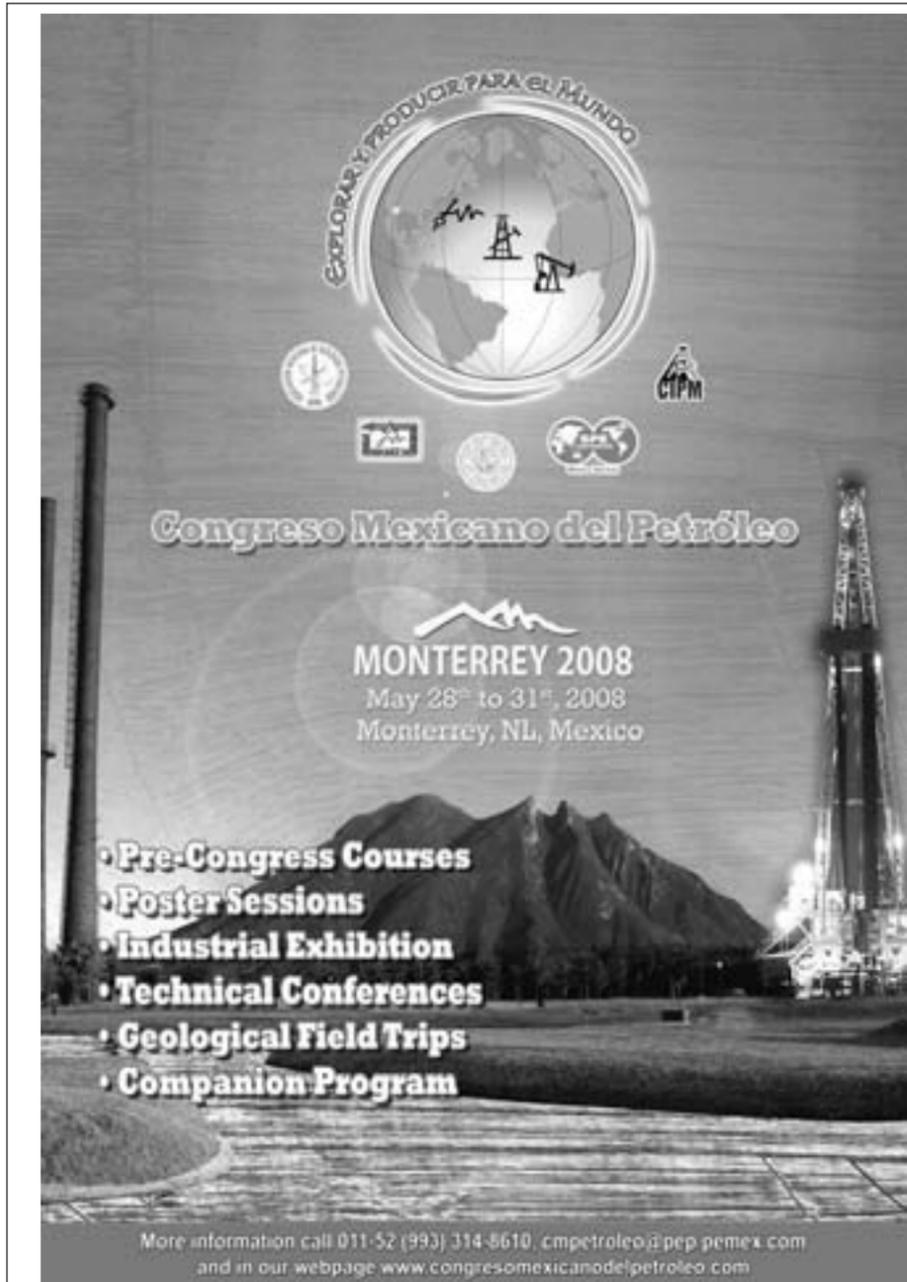
NAPE Attendance 1993-2008			
Year of Event	Attendance	Number of booths	Number of Companies
1993	781	121	88
1994	1,509	162	143
1995	2,559	243	202
1996	3,471	290	217
1997	4,608	325	288
1998	5,775	361	310
1999	6,319	611	436
2000	7,033	686	533
2001	8,030	799	554
2002	8,299	817	568
2003	8,689	799	561
2004	9,562	878	589
2005	10,777	1,038	664
2006	13,000	1,241	786
2007	14,460	1,454	885
2008	15,767	1,610	958



Track the Technical Program and Registration Announcement at www.aapg.org/capetown



AAPG INTERNATIONAL CONFERENCE AND EXHIBITION
26-29 October, 2008 • Cape Town, South Africa



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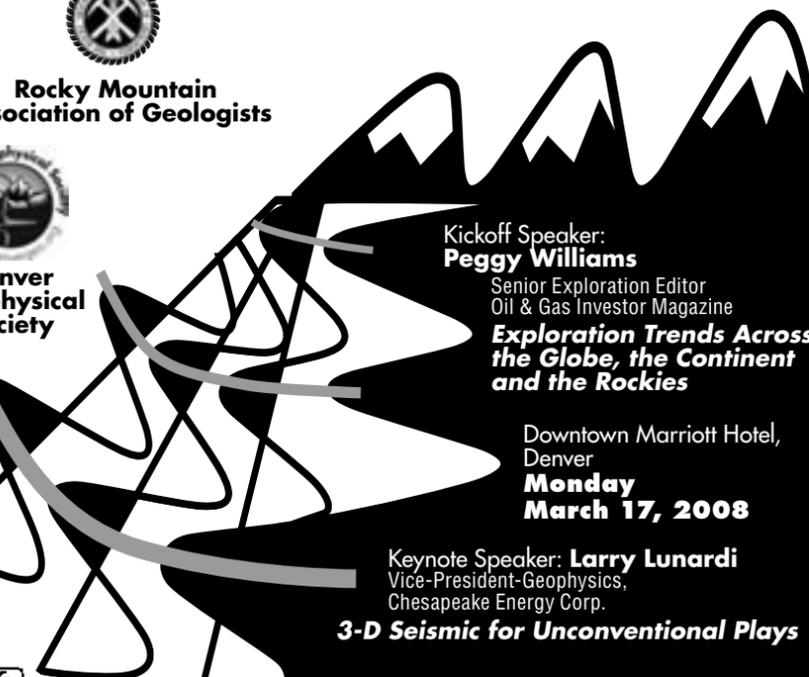
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Keynote Speaker: Larry Lunardi
Vice-President-Geophysics,
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Basin Petroleum Systems | Productive Fields & Analogues

IN ADDITION TO THE CONFERENCE SESSIONS, ALSO FEATURED WILL BE:

<p>FIELD TRIPS</p> <p>Nova Scotia (Pre-Meeting)</p> <ul style="list-style-type: none"> • Permian to Jurassic Rift Successions • Classic Carboniferous Sections • Onshore Cretaceous Reservoir Equivalents <p>Morocco (Post-Meeting)</p> <ul style="list-style-type: none"> • Triassic Synrift Reservoir Facies & Architecture <p>Portugal (Post-Meeting)</p> <ul style="list-style-type: none"> • Jurassic Carbonates & Fluvio-deltaic Successions 	<p>COURSES</p> <ul style="list-style-type: none"> • Practical Salt Tectonics • Petroleum Systems Modelling <p>CORE WORKSHOP</p> <ul style="list-style-type: none"> • Offshore Nova Scotia Reservoirs, Facies & Sequences <p>SEISMIC DATA ROOM</p> <ul style="list-style-type: none"> • Latest Central Atlantic Programs & Profiles <p>PROGRAM INFORMATION</p> <p>David E. Brown dbrown@cnsoppb.ns.ca</p> <p>Grant D. Wach grant.wach@dal.ca</p> <p>LOGISTICAL INFORMATION</p> <p>Trudy D. Lewis trudy.lewis@ns.sympatico.ca</p>
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ABSTRACT SUBMISSION DEADLINE
March 1, 2008
All abstracts must be submitted through the conference website

EXTENDED ABSTRACT DEADLINE
May 1, 2008
Extended abstracts for accepted papers must be submitted by this date

WEBSITE
www.conjugatemargins.com

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New Statement Reflects New Dues Options

As previously detailed in the January and February EXPLORER, your upcoming dues statement contains some changes.

Note the copy of the dues statement shown here: Categories of dues (as billed) will still be detailed in the box on the right (1), and the total amount the member owes will be printed on the top line on the left (2), along with the suggested Foundation contribution further down.

The most obvious change is the option for graduated dues (3), accessible to qualifying members. This is relevant only to members whose annual income is less than \$50,000.

The vast majority of AAPG members will qualify for Level 1 dues (\$80). If you do not have any changes to your publication options, you do not need to read the contents of the shaded area on the statement.

Those applying for reduced dues (Level 2 or Level 3), however, need to carefully read the entire statement and publication options, follow all instructions and remit appropriate fees by totaling the amount due at the bottom of the statement.

Remittance of lower dues means changes in how you will receive our monthly publications (excluding Emeritus and Students classifications).

Every member who wants to change their dues to Level 2 or 3 must initial (4) and return their statement to AAPG for verification. No other proof of income is required; this system is honor-based, as outlined in AAPG's code of ethics.

If you elect to pay Level 2 dues (\$40):

- ✓ You will continue to receive the print version of the EXPLORER.
- ✓ You will receive the BULLETIN online only.
- ✓ You can choose to receive the print version of the BULLETIN for an additional \$30.

If you elect to pay Level 3 dues (\$20):

- ✓ You will have access to the EXPLORER online.
- ✓ You will have access to the BULLETIN online.
- ✓ You can choose to receive the print version of the EXPLORER for an additional \$20.
- ✓ You can choose to receive the print version of the BULLETIN for an additional \$30.

As before, all members can choose to receive the BULLETIN in both formats (print and CD-ROMs) by paying an additional fee:

- ✓ For Level 1, the amount is \$34.
- ✓ For Levels 2 and 3, the amount is \$64 (because these members must pay an additional fee for print copy).

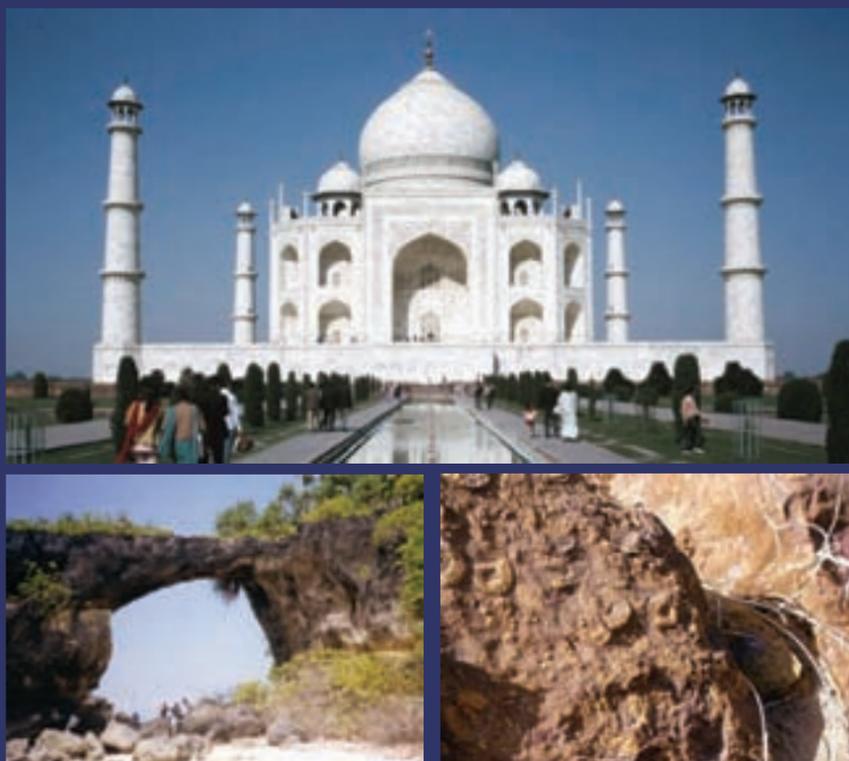
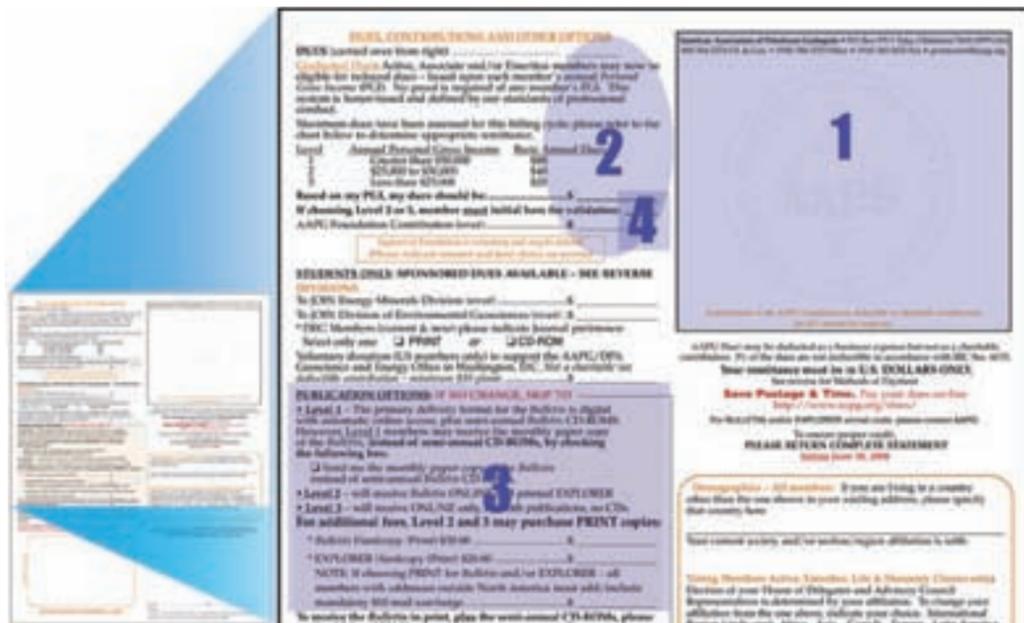
Level 3 members can choose to purchase the EXPLORER for an additional \$20 (plus an additional \$10 surcharge for addresses outside North America).

STUDENT MEMBERS: If you wish to have your dues paid by the Chevron-funded Corporate Sponsorship

Program, you must complete the back of the form and return to AAPG for processing.

Note: Division dues are not included in this program; those dues must be paid for by the individual.

Student members will continue to receive the BULLETIN in digital format only. □



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Overseas Exhibition Services
UK
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Asia
International Expo Management
Singapore
E: christine@iemallworld.com

India
Association of Petroleum Geologists (APG India)
E: apg_india@rediffmail.com

International
American Association of Petroleum Geologists (AAPG)
USA
E: ppryor@aapg.org

www.geo-india.com

...Better With Age

Question: How is AAPG membership like a fine wine?

Answer: It gets better – or certainly less expensive – with age.

Active members in good standing in the Association, with all dues paid to date, can become Emeritus members when they turn 65 years of age and have been members of AAPG (regardless of classification) for 30 years.

Emeritus members pay 50 percent of the amount of dues for Active members, including certification fees,

and are entitled to all privileges and advantages of Active membership.

They also receive a 50 percent discount on our annual convention registration – not only for themselves but for their registered spouse/guest too!

To change from Active to Emeritus status, all a member needs do is advise AAPG of their 65th birthday and request the classification change. To verify eligibility and request re-classification contact Jan Dorman in member services at jdorman@aapg.org, or call (918) 584-2555, ext. 623. □

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

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

For Active Membership

California

Carlsen, Ted, Venoco, Carpinteria (M.D. Wracher, M.J. Kamerling, K.W. Johnson);

Muter, Yakov, DHI Services, Carmichael (R.L. Pulley, K.E. Blake, V. M. Williams)

Kansas

Honas, Gerald D., self-employed, Wichita (reinstatement)

Louisiana

Josey, Angela G., Minerals Management Service, Hammond (F.A. Wiseman, J.W. Swaney, H.A. Karrigan); Walker, Donna M., Security Exploration, Shreveport (J.S. Comegys, T.W. Walker, K. Byram)

Maryland

Windolph, John Francis Jr., U.S. Geological Survey (retired), Knoxville (reinstatement)

Oklahoma

McCain, Greg Lee, Beacon Environmental Assistance, Edmond (W.F. Dost Jr., J.A. Brett III, T.H. Conklin)

Texas

Berry, Adrian K., Anadarko Petroleum, The Woodlands (L.C. Meibos, M.E. Podell, M.J. Beattie); Frost, Edmund Locke, ConocoPhillips, Houston (C. Kerans, S.L. Bachtel, S.W. Tinker); Long, Zach Ryan, Netherland, Sewell & Associates, Houston (M.K. Norton, D.E. Nice, P.L. Higgs); Ullrich, Julie Anne, Peyton Smith Petroleum Consultants, Houston (G.H. Coffey, G.D. Hatcher, M.S. Ullrich); Ye, Hongzhuan, Hyperion Resources, Plano (J.R. Davis, W. Beauchamp, R.G. Green); Zhumagulova, Akmaral, Chevron, Houston (D. Dull, D. Fischer, S. Jenkins)

Australia

Pagnozzi, Silvano Aldo, Tap Oil, West Perth (J. Jong, R. Hall, R. Cassie)

Austria

Knauthe, Ulrich Matthias, Fronterra Integrated Geosciences, Vienna (K. Blomenkamp, H. Homann, J. Hustedt)

Brunei

Al-Lawati, Mohamed Hassan Ali, Brunei Shell Petroleum, Seria (J. Tromp, P.A. Taylor, E. Arochukwu)

Canada

Kaminski, Richard, Apache Canada, Calgary (B.J. McKenzie, P.K. Pedersen, G.T. Hassler); Karri, Suryanarayana, Sproule International, Calgary (D.J. Carsted, J. Barrie, J.L. Chipperfield); McIntyre, Judith, Husky Energy, St. John's (I. Sinclair, L. Ennis, C.F. Lamb); Williams, Charles S., EOG Resources Canada, Cochrane (D.F. Minken, G.I. Pearson, B. McIntyre); Zhao, Mengwei, Bering Exploration, Calgary (J.F. Mueller, H. Qing, X. Luo)

Greece

Maltezos, Fotini, Hellenic Petroleum, Athens (N. Roussos, P.K. Papazis, K.A. Nicolaou)

Indonesia

Salahuddin, Andi AB, ConocoPhillips, South Jakarta (C.A. Caughey, R. Hall, C.F. Elders)

Kuwait

Obaid, Shams, LMKR, Ahmadi (P.H. Mock, J.R. Weston, E.C. De La Pena)

Malaysia

Pranata, Haruji Muda, Sarawak Shell Berhad, Miri (H. Darman, H. Semimbar, J.E. Laing); Pujiyono, Pujiyono, HESS, Kuala Lumpur (Y.H. Setiawan, R. Putrohari, G.B. Sulistyono)

continued on next page

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Certification

The following are candidates for certification by the Division of Professional Affairs.

Petroleum Geologist

Kansas

Totten, Matthew Wayne, Kansas State University, Manhattan (reinstatement)

Maryland

Mandell, Wayne Alan, the Army Environmental Center, Pasadena (reinstatement)

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The GeoCare International Plan. With Comprehensive Benefits, Affordable Rates and Exceptional Service, it Gives You the Confidence You Need When You're Working Overseas.

Inmemory

Mildred Armor Frizzell, pioneer geologist and longtime AAPG member, died January 14 in Oklahoma City. She was 101.

One of the first three women to receive a master's in geology from the University of Oklahoma, Frizzell taught geology at Oklahoma City University and was one of the first editors of the Oklahoma City Geological Society's *Shale Shaker* magazine.

She and her late husband, John, also a geologist, were active in numerous social, political and geological organizations.

* * *

John Clancy Barnes, 82
Sarasota, Fla., Dec. 15, 2007
James Bruce Coffman, 82
Houston, Jan. 19, 2008
Mildred Armor Frizzell, 101
Oklahoma City, Jan. 14, 2008

Kenneth James Fulton, 60
Aberdeen, Ohio, July 5, 2007
Marvin Earl Harges, 83
Midland, Texas, Jan. 9, 2008
William Carl Krafve, 81
Tyler, Texas, Dec. 15, 2007
Curtis V. Pennington, 51
Houston, Aug. 16, 2007
Robert Louis Segar, 68
Allen, Texas, Dec. 16, 2007
* M.O. Turner, 83
San Antonio, Aug. 24, 2007
Percival Walter James Wood, 82
Houston, Jan. 2, 2008
Edman R. Zink, 81
San Antonio, Nov. 23, 2007

(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. Asterisk denotes AAPG Honorary Member.)

continued from previous page

Morocco
El Baghdadi, Mohamed, Faculty of Science and Technology, Beni Mellal (A. Demnati, H. Jabour, A. Morabet)

Myanmar
Aung, Htun Hla, Schlumberger Logelco, Yangon (G.M. Gillis, Z. Wynn, J.G. Lingley)

Nigeria
Ajayi, Olakunle Augustine, Nigerian Agip Oil, Port Harcourt (O. Babatope, A.A. Carim, H. Mukoro); Imomoh, Victor Bello, Baker Hughes Inteq, Port Harcourt (E. Imomoh, E.G. Odior, S.O. Olabode); Oifoghe, Stanley, Schlumberger Nigeria, Port Harcourt (G.M. Gillis, M.G. Garber, R.J. Broetz)

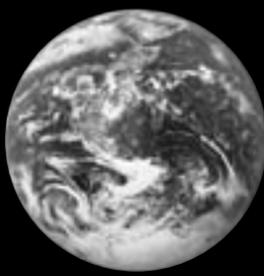
Norway
Hansen, Tore, StatoilHydro, Oslo (K.H. Jakobsson, K.J. Skaar, A. Spencer)

People's Republic of China
Qin, Zongchao, KerrMcGee China Petroleum, Beijing (D.W. Clark, F.C. Chang, S.J. Algranti)

Portugal
Pereira, Ricardo, Partex Services Portugal, Lisbon (T. Alves, J.E. Matos, H. Matias)

Romania
Toth, Peter, Schlumberger Data and Consulting Services, Ploiesti (K. Shaw, E.P. Malim, C. Shrivastva)

Scotland
Taylor, Helen Jane, Lacus Exploration, Aberdeen (A.D. Milne, P.W. Whiteley, J.R.V. Brooks) □



EGI Energy & Geoscience Institute
at the University of Utah

**Imperial College
London**

**EGI Professor in Petroleum Geosciences
at Imperial College London**

A new senior research appointment in petroleum geoscience is offered in the Department of Earth Science and Engineering that is part of the Royal School of Mines and the Faculty of Engineering at Imperial College, London, UK. The position is sponsored by the Energy & Geoscience Institute (EGI) at the University of Utah, Salt Lake City, as part of the EGI/IC research alliance.

We are seeking an enthusiastic earth scientist/petroleum geoscientist with proven experience in research, preferably with an established publications record. The position could include any branch of the petroleum geosciences, including structural geology, petroleum systems/basin analysis, reservoir sedimentology, sequence stratigraphy, 3D seismic interpretation and/or reservoir characterization/modeling. An established record in developing and managing petroleum industry-funded research projects would be advantageous.

The successful candidate will be the Director of the EGI/IC research alliance and based primarily at Imperial College in London. However, the position will involve establishing collaborative research links between EGI and IC, which will include time spent at EGI in Salt Lake City.

The level of the appointment will be subject to qualifications and experience, but will be at the Imperial College professorial level (minimum salary £59,430 pa).

A full curriculum vitae, application form and a recruitment monitoring form should be sent to:

Mrs. Maria A C Monteiro, Appointments Officer (Professors and Readers), Human Resources Division, Level 3 Faculty Building, Imperial College London, London SW7 2AZ, UK email: m.monteiro@imperial.ac.uk

www.egi.utah.edu

www.ic.ac.uk



SEPM Research Conference
Cliniform Sedimentary Deposits:
The processes producing them and the stratigraphy defining them.



Information, abstracts and registration at (www.sepm.org)

Conveners: Ron Steel (Jackson School of Geosciences, UT Austin) and Chuck Nittrouer (Earth and Space Sciences, Univ. of Washington)

CALL FOR ABSTRACTS
Registration Open Soon

**Abstract
Submission
—Deadline—
March 31, 2008**

**2008
August 15-18
Rock Springs
Wyoming, USA**

This conference brings together the modern, ancient and modeling communities who have an interest in clinoform deposits, specifically in their formation, character and significance. The focus will be on clinoforms found on continental shelves, in association with fluvial-deltaic systems, including the deeper water shelf margin.

Two days of invited keynote lectures and participant posters, plus two days of field seminar around Flaming Gorge (wave-dominated clinoform sets) and Rawlins areas (Haystack Mountains tide-influenced clinoforms; Fox Hills-Lewis river-dominated, shelf-edge clinoforms).

Keynote Speakers

- Alberto Figueiredo (Univ. Fed. Fluminense, Brazil) -- Amazon Clinoforms
- Carl Friedrichs (College of William & Mary, USA) -- Numerical Models
- Steve Goodbred (Vanderbilt University, USA) -- Ganges-Brahmaputra Clinoform
- Wojtek Nemec (University of Bergen, Norway) -- Delta-scale Clinoforms
- Ben Sheets (ExxonMobil Production Co., USA) -- Laboratory Simulations
- Ron Steel (University of Texas, USA) -- Margin-scale Clinoforms
- Fabio Trincardi (ISMAR-CNR, Italy) -- Apennine Clinoforms



SEPM Research Conference
Outcrops Revitalized:
Tools, techniques and applications.



Information, abstracts and registration at (www.sepm.org)

Conveners: Ole J. Martinsen (StatoilHydro), Morgan Sullivan (Chevron), Andy Pulham (Consultant) and Peter Haughton (University College, Dublin)

CALL FOR ABSTRACTS
Registration Open Soon

**Abstract
Submission
—Deadline—
March 15, 2008**

**2008
June 22-26
Kilkee,
County Claire,
Ireland**

New tools and methods used in outcrop geology over the last decade are a major breakthrough for the use and value of outcrop geology. The scientific gains from the new approaches will be addressed including the ability to integrate various data in completely new workflows.

Invited speakers include:

- | | |
|---|---|
| <p>Tools for Outcrop Data Collection</p> <ul style="list-style-type: none"> • John Thurmond, StatoilHydro, Norway • Neil Hurley, CSM, USA • Erik Monsen, Schlumberger, Norway • Mark Grasmueck, Univ. of Miami, USA | <p>Applications</p> <ul style="list-style-type: none"> • Mitch Harris, Chevron, USA • David Hodgetts, Univ. of Manchester, UK • Kirt Campion, ExxonMobil, USA • Julian Clark, Chevron, USA |
| <p>Outcrops for Modelling</p> <ul style="list-style-type: none"> • Xavier Janson, Univ. of Texas at Austin, USA • Didier Granjeon, IFP, France • Jeffrey Yarus, Houston, Texas • Paul Gillespie, StatoilHydro, Norway • David Hodgson, Univ. of Liverpool, UK | |

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READER'Sforum

Petition Candidates

As AAPG's annual officer elections approach with a petition candidate also on the ballot, it may be helpful to voting members to review the role of the Advisory Council (AC) in coming up with a slate of qualified competing candidates for AAPG office.

The AC consists of 17 elected representatives of "all the parts" of AAPG, including the three most recent past presidents. The present AC represents more than 400 years of accumulated AAPG experience and wisdom.

The AC is the first half of a "nominating tag-team," with AAPG's Executive Committee (EC) being the second half. The AC solicits widely among AAPG's various divisions, committees, Sections, Regions and affiliated societies for nominees to be considered. All members who have been formally nominated for office are considered by the AC – working from their official AAPG resumes and supporting letters – and evaluating them in relation to enumerated qualifications for each office.

Through open discussions, followed by a serial elimination process using secret ballots, the AC generates a final ranked list of candidates for each office – usually two candidates, but sometimes three or even four, if candidates are closely grouped.

The AC's list is then submitted to the EC for its approval. Ordinarily the EC accepts the AC's top two candidates, but may select a candidate ranked third, or even fourth if a supermajority of the EC approves.

The EC's final list then constitutes the official slate of officer candidates for the coming fiscal year.

The deliberations of the AC and EC are conducted in executive session – that

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.

is, in confidence. There is a very good reason for this: *It promotes full evaluation of all nominees' positive qualifications as well as their negative attributes in selecting the best candidates for office.*

If AAPG were a partisan political organization, the various negatives of the competing candidates would be revealed and dissected during political debates, trumpeted in local news releases and finally evaluated by AAPG voters. Most AAPG members agree that this would be unseemly for a professional association, so the membership has entrusted the AC and the EC to consider pertinent negatives and positives of all candidates – and any comparisons among them – in a private, confidential venue, on behalf of the membership.

I can assure all AAPG members that the AC and the EC take this responsibility very seriously indeed, devoting many days to the process, and neither group shrinks from objective consideration of negative qualities that might detract from a nominee's performance in office, if elected.

AAPG's bylaws also provide for petition candidacy, whereby a member who has not been officially nominated for an office may be placed on the ballot among those candidates who were. This is accomplished by presenting a petition signed by 50 active AAPG members.

The justification for petition candidacy is that it offers redress to members seeking:

✓ To bring positive change to an underperforming organization.

✓ To challenge a self-perpetuating leadership clique.

✓ To counter perceived personal bias against them on the part of AC or EC members.

I happen to believe that petition candidacy is a useful constitutional safeguard, *if used for such valid purposes.* Petition candidacy's drawback is that it bypasses, or ignores, the AC's vetting process.

AAPG's nomination process is open to all members. It draws on the diversity and experience of many elected AAPG leaders. It facilitates the objective evaluation of candidates' pertinent strengths and weaknesses and it allows our elections to proceed in a dignified, nonpartisan way.

Petition candidacy should not be necessary except in extraordinary circumstances.

Peter R. Rose
Austin, Texas

(Editor's note: Rose is a past president of AAPG and a current member of the Advisory Council.)

Work Force Déjà Vu

I read Rick Fritz' column "Work Force Is a Major Concern" (Director's Corner, January EXPLORER) and it was déjà vu on the flip side.

I remember (reading) in the late 1980s-early 1990s several columns warning of the drop in geology students, what it might bode for the future of the industry and what could be done to

encourage more students to study geology. And here we are nearly 20 years later and, yes, there is a problem.

However, what impressed me then and now is a near total disregard for the geologist in the proposed solutions.

In the '90s the goal was to keep students rolling through the academic mill even though there were few new jobs for petroleum geologists and their working counterparts were being laid off in large numbers. Today, even though Fritz sees that the current lack of available geoscientists is in part due to "past job security issues" (what about future job security issues?), his solution is to increase the number of geology students through public relations efforts in communication, support and recruitment and to increase the amount of foreign workers.

AAPG is an international organization – but regardless of one's perspective I do not believe that increasing immigration quotas, thereby increasing the candidate pool to hire and fire, is good for the professional or the profession in the long run, and I do not believe that the AAPG should lobby for this.

Regarding the "work force" issue, our effort should be in researching and lobbying for changes in business practices with the goal to stabilize to some degree the job market.

Everyone knows that the oil industry has been and probably will remain cyclic. Our industry prides itself in thinking long term.

Why not with employment?

John Hill
Raleigh, N.C.

continued on next page

Saadgeo

Enhanced Reservoir Characterization

Based Upon Borehole Images & Dipmeter Data

My Experience (I just celebrated the 94th finalized study) mainly built on reservoirs of Denmark, Irak, Iran, Italia, Kazakhstan, Norway, Qatar, UK & Saudi Arabia.

Using original data from several tools of most companies:

FMI, FMS, UBI, OBMI, GVR, ADN, HDT & SHDT (Schlumberger); CBIL, STAR & HEXDIP (Baker Hughes); CAST, ALD (Halliburton); EMI (XRMI) (CNLC).

Implementing the powerful software Recall (Petris) to determine/perform systematic analyses of surface populations & image fabric zonations showing up Sedimentologic Characteristics & Deformation Facies.

To help highlight key features of Clastic/Fractured Reservoirs: Structural Dips, Unconformities, Major/Minor Faults, PaleoHorizontal Dips, Paleocurrent Directions, Fracture Network In Situ Stress Field, Natural Draining Network, ...

In addition to particular topics such as potential/actual "Pipe-Channel" and "Pipe-Layer" (here an example).

Contact Dr. Abdelkader Saadallah

Tel.

+47 51526265 (office)

+47 51538382 (home)

+47 47270475 (mob.)

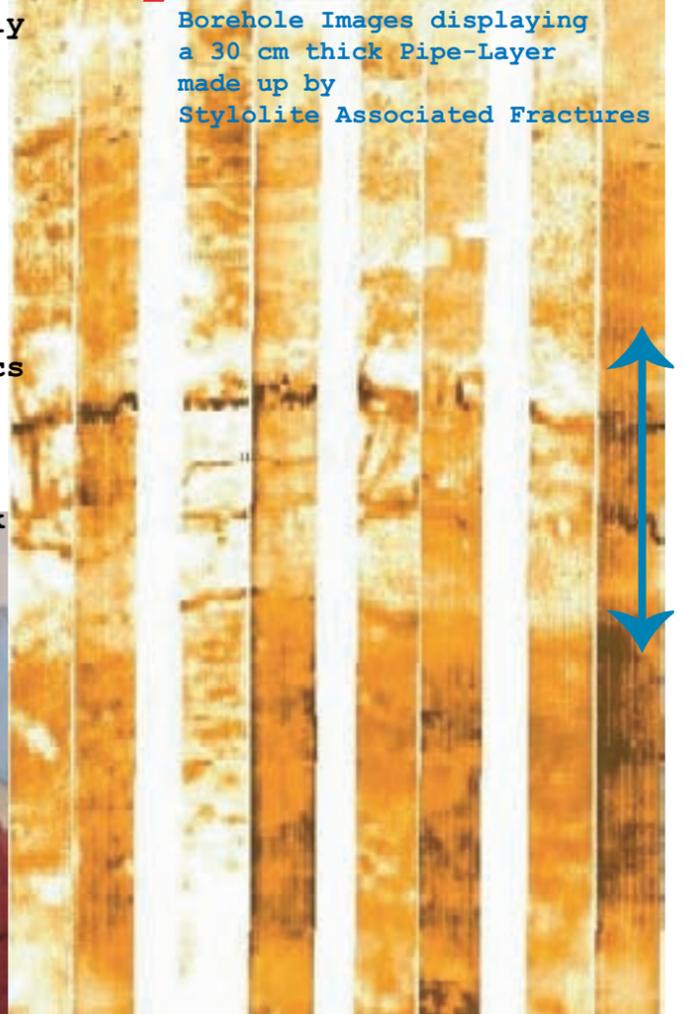
email: kader@saadgeo.com

website: www.saadgeo.com

Misjonsveien 39, 4024 Stavanger Norway



Borehole Images displaying a 30 cm thick Pipe-Layer made up by Stylolite Associated Fractures



continued from previous page

Hypewriters?

Regarding your story on the discovery at Brazil's Tupi Field (January EXPLORER), which included this information: "Eight billion BOE reserves indicated."

This is just the type of blah, blah, bad dog statement to mislead those who think there is plenty of oil out there and there will be no future shortages.

How much gas and how much oil? They have two wells drilled, apparently with great difficulty and at great expense in most challenging conditions. This field is PIIP, Discovery, probably commercial under the new guidelines.

There is no way that any reserves numbers being talked about have any validity. We weren't given flow rates, pressures, temperatures, BS&W, GOR, formation tops, G/O and O/W contacts in either of the wells. We haven't been provided with the sedimentary environment, diagenetic history, porosity, permeability, etc., etc.

This is a geologic publication. Let us get our act together and report like scientists and not some junior reporter who thinks oil is found in lakes under the earth and we have to suck it out and not have massive blowout preventers to keep it from putting the drilling rig and production facilities into orbit.

Conrad Maher
Newport Beach, Calif.

Backing the Barnett

I just read the letter about the Barnett Shale ("Misleading?" January EXPLORER) as I sit in our mudlogger's trailer waiting for the wireline-logging company to finish rigging up. And, yes, the well I'm sitting on is located in northeast Erath County, Texas, on the western edge of the Barnett Shale play.

The writer believes that fully two-thirds of the wells drilled in the Barnett are not only non-economic, but won't even pay out. Now, there have been many wells drilled in the play over the past 25 years that will not pay out, but not anywhere close to two-thirds of all Barnett wells fall into this category.

I invite the writer to publish his analysis of the economics of the Barnett play; I'm sure the management and stockholders of all the companies involved in the play would find it of great interest to see how they are wasting their capital investment in the largest "uneconomic" play the industry has ever seen.

Kent A. Bowker
The Woodlands, Texas

Hubbert

James E. Wilson's nice synopsis of King Hubbert's prediction – and the industry's reaction to him and his prediction – raises a warning for today (January and February EXPLORER).

I remember well the abuse heaped upon Hubbert for daring to predict something that most of the industry did not want to hear, and certainly didn't want in the public arena. The arrogance of industry was proven dead wrong and Hubbert was proven correct by history. Today the United States is producing 1.6 billion barrels less per year than we were producing at our peak.

It is a shame that those who seriously raise the possibility of near-term peaking of world oil are currently being subjected to the same sort of disgraceful treatment to which Hubbert was subjected.

I attended the 2005 and 2007 annual conferences of the Association for the Study of Peak Oil. The speakers were extremely knowledgeable, experienced and astute in their analysis of the world situation. I found their conclusions much more reasonable than the optimistic conclusions of Cambridge Energy Research Associates and the U.S. Geological Survey.

It would be nice to hold a truly open discussion of the possibility of near-term peaking. Let's also try and reduce the arrogant, dismissive rhetoric that many in the industry are showing toward those who seriously raise the possibility of near-term peaking of world oil production.

Vincent Matthews
Denver

Thanks for the interesting articles

on King Hubbert by James E. Wilson. I only wish the Hubbert curve published in the EXPLORER matched the written commentary of Mr. Wilson.

I was also surprised that the original article by King Hubbert wasn't more specifically identified so interested geologists could read that original for themselves.

Elroy P. Lehmann
Dallas

(Editor's note: King Hubbert's paper, "Nuclear Energy and Fossil Fuels," which included the famous "Hubbert Curve," was presented before the American Petroleum Institute's Southern District spring meeting in San Antonio in March 1956. It was then published in June 1956 in Shell Development's Publication Number 95.) □

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Knowledge of: Multiphase-flow reservoir simulation, reservoir characterization, pressure transient analysis, volumetric calculations, decline curve analysis, material balance methods, equation-of-state modeling and history matching. Demonstrated knowledge and experience in simulation of CO2 flooding or gas injection for EOR. Working knowledge of commercial reservoir simulators, pre- and post- processing software, Linux operating system and Microsoft Office software package.

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MEETINGSofnote

(* Denotes new or changed listing.)

2008 U.S. Meetings

April 20-23, AAPG Annual Convention, San Antonio.

May 5-8, Offshore Technology Conference, annual event, Houston.

* May 12-15, Society of Independent Earth Scientists, annual meeting, New Orleans.

July 9-11, AAPG Rocky Mountain Section, annual meeting, Denver.

* Aug. 22-24, AAPG Annual Leadership Conference, annual event, Tulsa.

Aug. 27-28, Summer NAPE (North American Prospect Expo), AAPL, annual event, Houston.

Sept. 3-7, AAPG Foundation Trustee Associates, annual meeting, Jackson Hole, Wyo.

Sept. 21-24, Society of Petroleum

Engineers, annual meeting, Denver.

* Oct. 5-9, Gulf Coast Association of Geological Societies, AAPG, annual meeting, Houston.

Oct. 5-9, Geological Society of America, annual meeting, Houston.

Oct. 11-15, AAPG Eastern Section, annual meeting, Pittsburgh.

Nov. 9-13, Society of Exploration Geophysicists, annual meeting, Las Vegas.

2008 International Meetings

March 24-26, AAPG Prospect & Property Expo-London, annual event, London, England.

*Sept. 17-19, GEO India, AAPG, New Delhi, India.

Oct. 26-29, AAPG International Conference and Exhibition, annual meeting, Cape Town, South Africa. □

Online registration is now open for the AAPG Pacific Section's annual meeting, set March 31-April 2 in Bakersfield, Calif.

The meeting will be held jointly with the SPE Western North American Region, with the theme "Adding Reserves Through Collaboration, Innovation and

Technology Transfer."

Keynote speakers will be AAPG President-Elect Scott Tinker and SPE President William Cobb.

Meeting details are available online via the AAPG Web site. Registration is available at www.regonline.com/SPEWR_PSAAP_G_2008.

continued from previous page

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Professor Alan Robson – Vice-Chancellor

A teaching and research centre for petroleum geoscience is being established within the School of Earth and Geographical Sciences at The University of Western Australia (UWA). Funding related to this initiative is being provided by Woodside Energy Ltd, Chevron Pty Ltd, the Western Australia Energy Research Alliance (WA:ERA) and UWA. The Centre is expected to begin operation early in 2008. The School of Earth and Geographical Sciences at UWA is one of the leading geoscience groups in the world with established strengths in resource industry teaching and research. The successful applicants will be joining a group with extensive experience in teaching and research designed for the needs of the local and international resource industry.

WOODSIDE-CHEVRON CHAIR IN PETROLEUM GEOSCIENCE (REF: 2107)

This position is funded by Woodside Energy, Chevron and UWA. The Chair's role calls for an outstanding geoscientist with a demonstrated record of achievement in petroleum geoscience. Applications are also encouraged from individuals early in their career who can demonstrate outstanding potential. The appointee will have primary responsibility for building and leading a unique and sustainable research and education enterprise and will also provide technical advice to the sponsoring companies. Experience of working in, or closely with, the petroleum industry is essential.

The appointment is initially for 5 years with extension of this term and the opportunity of a permanent appointment dependent on the success of the Centre and satisfactory performance reviews.

RESEARCH FELLOW/SENIOR RESEARCH FELLOW (REF: 2108)

This three year appointment is funded by the Western Australian Energy Research Alliance (WA:ERA). The appointee will play an active role within the petroleum geoscience discipline in the University and industry and will work closely with WA:ERA partners in particular the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Applications are sought from candidates with expertise in any field of petroleum geoscience but with preference given to geologically oriented interpretation of seismic reflection data. The successful applicant's expertise will complement the geophysical, petrophysical and reservoir-scale expertise available in UWA, CSIRO and Curtin University. Experience of working in, or closely with, the petroleum industry is highly desirable.

Closing date: Friday, 28 March 2008.

The University of Western Australia offers an attractive remuneration package including generous superannuation and leave provisions, fares to Perth (if applicable) for appointee and dependants along with a removals allowance.

For further information regarding the positions please contact Professor Mike Dentith, on 61 8 6488 2676 or email mdentith@cyllene.uwa.edu.au, School of Earth and Geographical Sciences

The Information for Candidates brochure which includes details to assist with your application may be found at <https://www.his.admin.uwa.edu.au/Advertising/2107-2108CandidateInformation.pdf> or via a link at <http://jobs.uwa.edu.au/> or contact Ms Toni Pilgrim, Human Resources on +61 8 6488 3533, email toni.pilgrim@uwa.edu.au. Written applications should be sent to Ms Toni Pilgrim, Human Resources, M350, The University of Western Australia, 35 Stirling Highway, Crawley, WA 6009 or to lodge an application electronically please refer to the Information for Candidates brochure for details.

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DIRECTOR'S CORNER

'Shape up!' It's Meeting Season

By RICK FRITZ

In an attempt to improve the health of our employees AAPG is looking at several programs this year to help staff eat and exercise better.

As part of the program several of AAPG's staff scheduled time at a nearby health center to play sports. We played volleyball the first week and it was a lot of fun and decent exercise.

The second week we played basketball. That's probably all I need to say.

We agreed that we would play an easy half-court basketball game. Of course, as soon as the game started it became competitive and by the end of it we were totally exhausted. It was the best exercise I have had in months. Of course, a day later we were all limping and commented about our bruises and sore muscles.

I'm not sure that it's really a "wellness" program.

* * *

AAPG is about to start its meeting "exercises" for the spring.

I have just reviewed all of the meetings in which AAPG operates, sponsors and/or exhibits. This spring and early summer we are involved in at least 14 conventions – and this does *not* include all of AAPG's educational offerings or meetings associated with the new operations of the Petroleum Technology Transfer Council.

Each year volunteers and staff focus on technical content of the meetings with quality educational and business opportunities. We also focus on trying to consolidate meetings to avoid duplication.



Fritz

Joint meetings with sister societies are key to keeping the number of meetings manageable each year.

When scheduling meetings, our staff here makes every effort to try to avoid overlap of key events – especially religious and secular holidays. This has become more difficult since 9/11, as advance booking of convention facilities and hotels is more critical and contracts tighter with greater penalties. Also, since AAPG does not return every year to a city we are often competing with major corporations or entities for the prime spots.

As I started writing this column we had staff and members attending the Colombia Oil and Gas Investment Conference/Oil and Gas Technical Conference in Cartagena, Colombia (see story, page 48). This is a very important conference for the South America Region.

Also, many staff and members were in Houston for the annual NAPE conference, which was shaping up as one of the largest in its history. For the first time this year the International Pavilion L.L.C. managed the international exhibits.

By the time you receive this EXPLORER we will be in the middle of or just finishing

Events such as the annual meeting are great places to do professional retraining.

the GEO (Bahrain) Middle East conference and the APPEX London prospect and property expo. The technical programs, exhibits and sponsorship for both meetings look good and we are expecting excellent participation.

There are two Section meetings this quarter: the AAPG Southwest Section Feb. 24-27 in Abilene, Texas, and the AAPG Pacific Section meeting in Bakersfield, Calif. is scheduled March 29-April 2.

This summer the AAPG Rocky Mountain Section will meet in Denver on July 9-11. (Please refer to the AAPG Web site if you need additional information or want to link to register for any meetings.)

Of course, the AAPG Annual Conference and Exhibition (ACE) is our big show for the spring, and this year ACE will be held in San Antonio (see story, page 52).

Incidentally, the initial registration numbers for San Antonio are among the highest for any recent AAPG ACE meeting except Calgary. Although we added extra hotel rooms this year, early registration is so high that many of the room blocks already are full.

Our convention staff has added more

rooms, so please let us know if you have any difficulty.

Under the leadership of general chairman Gene Ames III, the San Antonio program is full with many opportunities for networking, business and education.

This year the technical program is strong with a number of new topics including special sessions on global climate change and the future of women geoscientists.

* * *

I played basketball a lot when I was younger. It's funny how your instincts automatically tell you to do things based on old habits – things your body may not want to do or be capable of doing anymore.

For example, during the first staff basketball game the ball was going out of bounds and my sub-conscience told my body to dive for it. As I was flying through the air I was clearly thinking, "Why on earth am I doing this!?"

I hope I can retrain my sub-conscience before I do too much damage.

At AAPG we *think* a lot about operating and developing meetings for the benefit of our members and industry. Events such as the annual meeting are great places to do professional retraining.

I encourage you to make the most out of these opportunities.

It's the sediment, stupid

Coastal Plain All Out-Go, No In-Come

By CHARLES G. "Chip" GROAT
DEG President

This is my soapbox column.

I know I am preaching to the choir – but from an environmental geoscience perspective I am presenting thoughts about some basic geologic process understandings that should be having more influence on a potentially multi-billion dollar reconstruction effort than they are having.

I begin with some geologic facts about the most important delta in the United States.

* * *

The coastal Louisiana landscape was built from sediments supplied by the Mississippi River and deposited on its delta or along adjacent shorelines, carried there by longshore currents.

Since the supply of sediments has been reduced in a substantial way by engineered structures that dam and confine the river, very little sediment from the river reaches these environments.

The wasting of the coastal plain is due in large part to the absence of major influxes of sediment, leaving the destructive mechanisms of subsidence and wetland attrition as the dominant forces there. Thus the root of the current dominance of subsidence in the delta and resulting wetland loss is the cutting off of floodwaters – and their sediment load – to most parts of the system.

Over the many years that restoration of the Mississippi delta plain in south

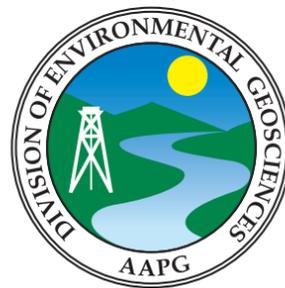


Groat

Louisiana has been under consideration by the state and the U.S. Army Corps of Engineers, the size of proposed restoration projects has been generally small consisting of small diversions – mostly of water to refresh marshes, not sediment to build land.

This has been accompanied by hand-wringing over the continued loss of delta-plain wetlands.

The fact is, there is no sustainable approach to preserving and growing land in the Mississippi delta that does not include restoring large-scale sediment delivery to distal wetlands. Available data



suggest that despite historical reductions in sediment load, the lower Mississippi River still transports sufficient sediment to meaningfully counteract current subsidence and sea level rise – if that sediment is effectively delivered to subsiding delta wetlands.

Accomplishing this will require creative, out-of-the-box approaches that go beyond

* * *

minor diversions over and through existing and planned engineered structures.

It will require major river diversions that distribute sediment currently channeled off the edge of the continental shelf into distal coastal wetland environments.

This will need to be accompanied by other measures, such as getting water and sediment currently moving down the Atchafalaya River into wetlands and perhaps pipelines to deliver sediment into some areas.

While past arguments in favor of coastal-plain habitat restoration have focused on natural system values and the economically important productivity of these systems, post-Hurricane Katrina planning – centered around the protection of lives and property from hurricane surges, waves and flooding – includes the natural landscape as an important component of a protection system.

With this human-centered rationale for restoring the delta plain, the substantial challenges related to the infrastructure and societal issues associated with large-scale sediment diversions should receive the creative attention that has been lacking in the past.

Without approaches that deliver quantities of sediment more on a scale of those that built the delta, meaningful restoration and protection of distal parts of the delta plain is not possible, and plans should be laid for abandonment of these areas. □

DEG Announces Candidate Slate

The AAPG Division of Environmental Geosciences has announced the following candidates for its next slate of officers:

Terms of office will begin July 1.

President-Elect
(2008-09; President 2009-10):

□ Michael A. Jacobs, Pioneer Natural Resources USA, Midland, Texas.
□ Chacko J. John, Louisiana Geological Survey, Baton Rouge, La.

Vice President (2008-09):

□ Mary K. Harris, Savannah River National Laboratory, Aiken, S.C.
□ Kevin S. Hopson, Daniel B. Stephens & Associates, Lubbock, Texas.

Editor (2008-10)

□ James W. Castle, Clemson University, Clemson, S.C.
□ Dibyendu Sarkar, University of Texas at San Antonio, San Antonio. □

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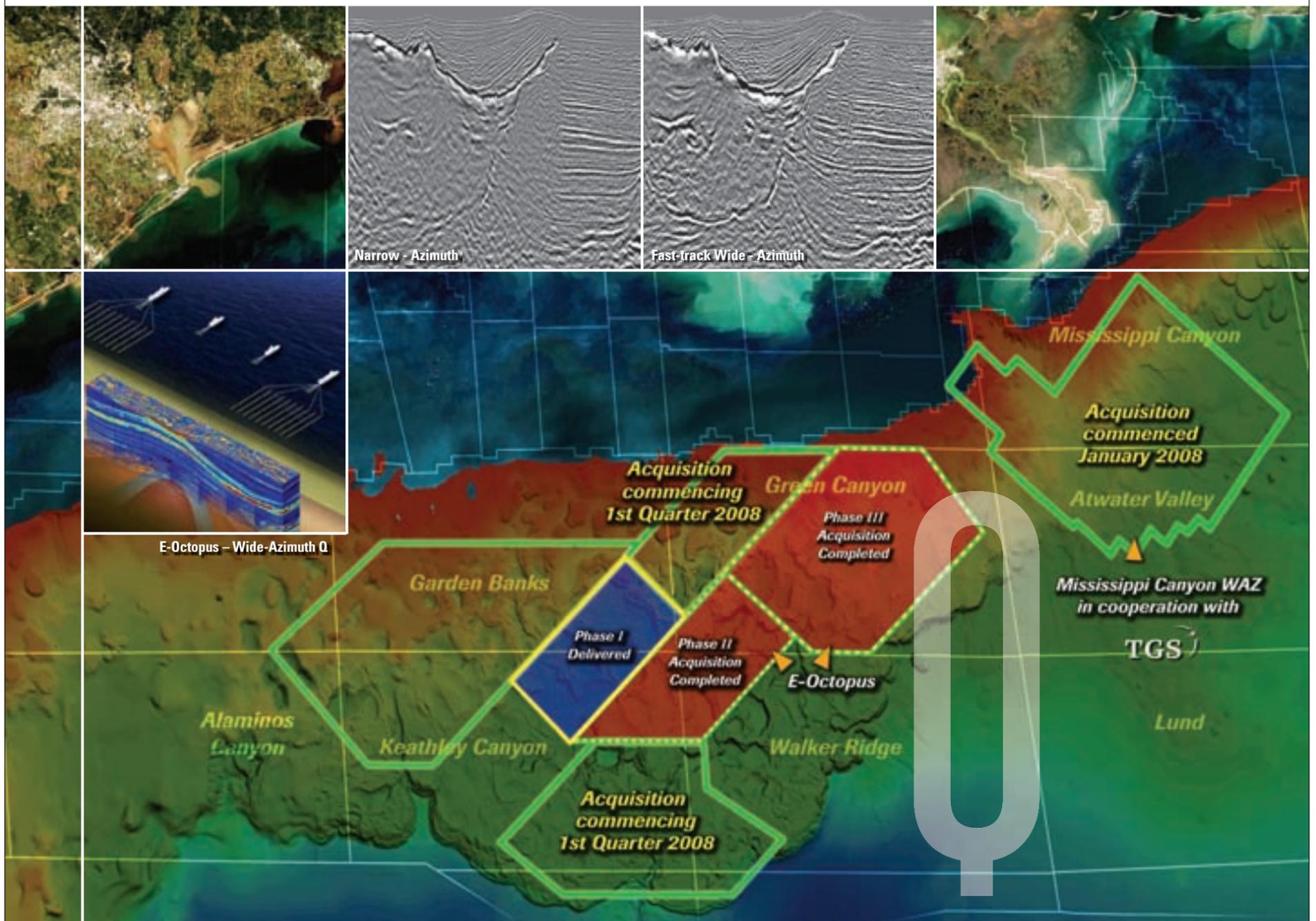
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