

AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

EXPLORER

APRIL 2009

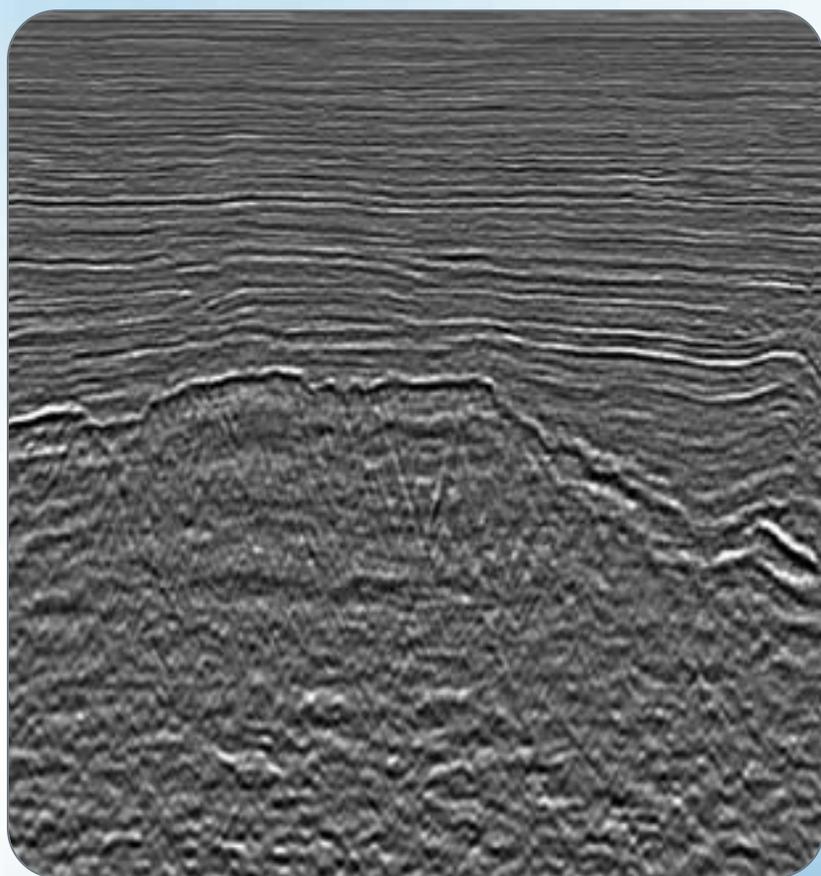


Chapter Two

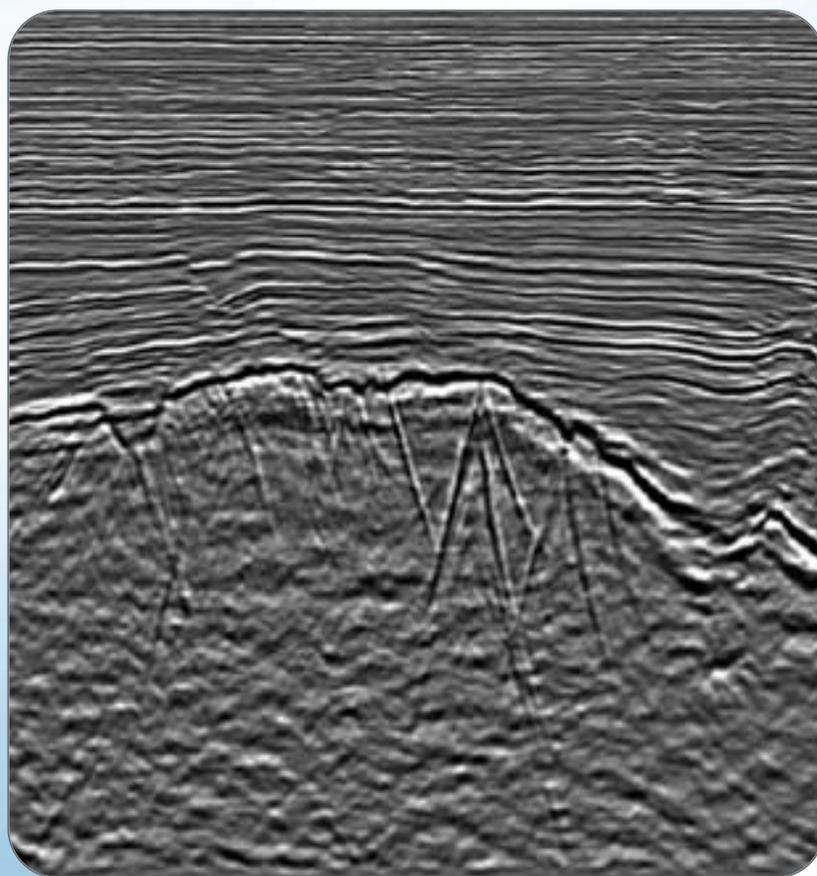
Is Utah's next play a gift of Providence?



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- ➔ To image the oil-bearing fracture zones in a complex granite basement reservoir offshore Vietnam where conventional methods fail to produce convincing results.

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RESULTS

- ➔ Based on the new CBM images, the operator was able to confidently carry out a successful drilling campaign to develop the reservoir.



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On the cover: First came the Covenant, now comes the Providence: Utah continues to attract geologists' interest and industry headlines with oil discoveries that seem destined to overcome its challenging geologic structure. The latest update on what's been a busy – and so far, successful – exploration effort in Utah can be found on page 10. Our cover photo shows the discovery well at the Providence Field, a play that could be Utah's "next big thing." Photo courtesy of Wolverine Oil and Gas.

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It's prime time for field trip season, and AAPG has just what you may be looking for – including the "Submarine Canyon and Deepwater Sandstones" field trip (pictured here) that gives geologists a chance to study cross-cutting channels in Eocene Torrey Submarine Canyon, La Jolla, Calif. Information on this and all education department events is available online at www.aapg.org.

PRESIDENT'S column

Should I Stay Or Should I Go?

By SCOTT W. TINKER

Last month I was in Denver for a Town Hall meeting sponsored jointly by the AAPG Foundation and Association. Over 200 people attended a reception made possible by the generosity of Bill Barrett, Ray Thomasson and Steve Sonnenberg (see related story, page 38).

For my part, I spoke briefly to those convened and then opened the floor for questions, which were thoughtful, probing, insightful and revealing. I was at once proud and honored to be president of AAPG!

I stayed for quite a while after the formal Q and A, talking in small groups to AAPG members; I anticipated questions about the AAPG, challenges to some of my global tenets, thanks to me for serving and the like.

On this night, however, I was approached by a woman in her 30s, obviously bright and passionate about being a geologist. She asked, "Tell me why I should stay in this industry! Why should I not leave it for environmental or some other industry entirely? Tell me why!"

The question threw me back nearly 25 years: I first worked in the industry for Bob Sneider 1982-83, went back to



Tinker

graduate school and in 1986 was with Champlin Petroleum in Denver. Layoffs hit our industry hard and repeatedly for a few years. I never lost my job, but many of my friends did and many were asking, "Why should I stay in this industry? Why should I

not leave it for some other industry entirely?"

And many left.

The world cannot afford for that to happen again.

* * *

Oil price cycles have been around since the industry began. Prices stabilized in the 1950s and '60s, but hit their volatility stride again in the '70s. Following the greatest inflation-adjusted rise in oil price in the modern era in 1982, hiring slowed dramatically and layoffs were rampant, except for one or

See **President**, next page

AAPG Voting Continues Online

Balloting for AAPG officer candidates for the 2009-10 term continues to be available online until the voting deadline May 15, at 11:59 p.m. CDT.

While electronic balloting is available to all members a paper ballot also will be sent.

Survey and Ballot Systems, which handles the AAPG election, has a coded system where only one ballot per person is counted, with the paper ballot taking precedent if both are submitted.

Candidate biographies and individual information continue to be available online at www.aapg.org.

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

The slate is:

President-Elect

- Donald D. Clarke, geological consultant, Lakewood, Calif.
- David G. Rensink, Apache Corp., Houston.

Vice President-Regions

- Adekunle A. Adesida, Shell Petroleum Development, Nigeria.
- Alfredo E. Guzman, consultant, Veracruz, Mexico.

Secretary

- William S. Houston, Samson, Denver.
- Peter MacKenzie, MacKenzie Land & Exploration, Worthington, Ohio.

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President

from previous page

two visionary companies that did not overreact. College students began to choose other majors, often non-science, and geoscience professors began to focus on non-petroleum related subjects.

Thus, when oil prices began to rise again steeply in the early 21st century there were very few students to hire.

"Where are our students?" came the cry from industry.

"Where have you been?" was the reply from the hallowed halls of academe.

Companies began to compete fiercely for limited talent and cannibalized talent from one another. Signing bonuses were paid to grad students for summer jobs! The "good

times" were back.

Some of us beseeched companies not to make the same mistakes that were made in the 1980s. Be more moderate in the highs, and put some "money under the mattress" to keep people employed when the lows arrived.

The lows are here.

Did we learn from 1986? Are we learning today? (see page 6.)

If we mess it up this time, in certain parts of the world the trust of students will be lost for good.

* * *

To improve, we must first understand. At the risk of oversimplifying, here's a look at the latest cycle:

✓ Global oil demand in developing nations pressured supply.

✓ Speculators hedged and bought

oil to protect against a weak dollar.

✓ Demand and speculation drove up the price of oil.

✓ High price dampened demand.

✓ Mortgage and credit crises slammed global markets and the economy went into recession.

✓ Weak demand, tight credit, exiting speculators and recession drove oil price down dramatically in less than a year.

✓ OPEC cut oil production in an effort to stabilize oil price and producers have begun laying down rigs, which will drive production down further.

✓ Lower oil (and energy) prices will help bolster the economy and demand will begin to increase, especially in developing nations.

✓ Global oil demand will pressure tight supply, and the cycle will begin again.

It's no secret we are smack dab in the middle of a "low oil price" time,

which makes many E&P projects uneconomic. Combined with very tight capital markets, lingering high drilling and service costs, intentional production cuts by OPEC and recession demand for and production of oil and gas is declining globally.

* * *

Amidst all of this, the U.S. government has reached new levels of inexplicable. I half expect to see Mulder and Scully of "X-Files" fame make a guest appearance on C-Span, roaming the aisles of the Senate chamber with mystified looks on their faces ...

In fairness, President Obama inherited one heck of a messy economy. And some of the things he is doing I support. Not so, however, his proposed energy "policy."

Follow this:

In an effort to wean the American people from foreign oil, the president has asked Congress to remove vital tax incentives for high-risk exploration and add additional taxes onto the oil and gas industry.

Compounded with crushingly low energy prices, tight capital markets and lack of drilling access, this new "policy" likely will put many independent producers out of business, causing jobs to fall faster than oil rigs, accelerate U.S. production decline, decrease the federal tax base, expose U.S. resources to purchase by foreign interests and make the United States even more dependent on foreign sources of oil and natural gas further risking national security.

Low energy prices will eventually help the economy recover. Recovering economies need energy, which will be in even shorter supply if we pursue the proposed energy policies, and cause oil price to bounce up once again – likely way up.

Extreme highs and extreme lows are extremely unhealthy. Wise policy should work to mitigate volatility, not enhance it.

Wake up, Washington!

Just because the banking, housing and auto industries need to be bailed out doesn't mean you have to set policies that crush another major industry. The oil and gas industry is the bridge on which global economic recovery can be built.

Work with us for the benefit of everyone. We all are on the same team.

* * *

How did I respond to the woman in Denver?

I asked her if she was passionate about what she did. She said she loved drilling gas wells.

I challenged her to stay with it and counseled that it would not always be easy.

I suggested that hard work can be fun – which elicited a bit of a glare!

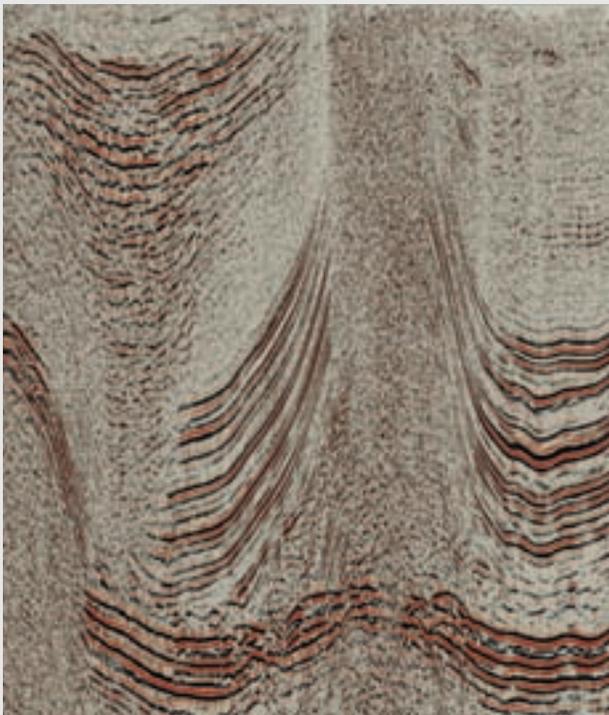
I promised her that our great industry has jobs for those who are passionate and who are willing to adapt.

To those of you in positions of influence globally, please put the greatest of care into developing creative ways to retain jobs, keep hiring programs active and continue your support for research at universities so that there will be students in the pipeline when things turn around again. Let's not become part of the problem by overreacting in good times and bad.

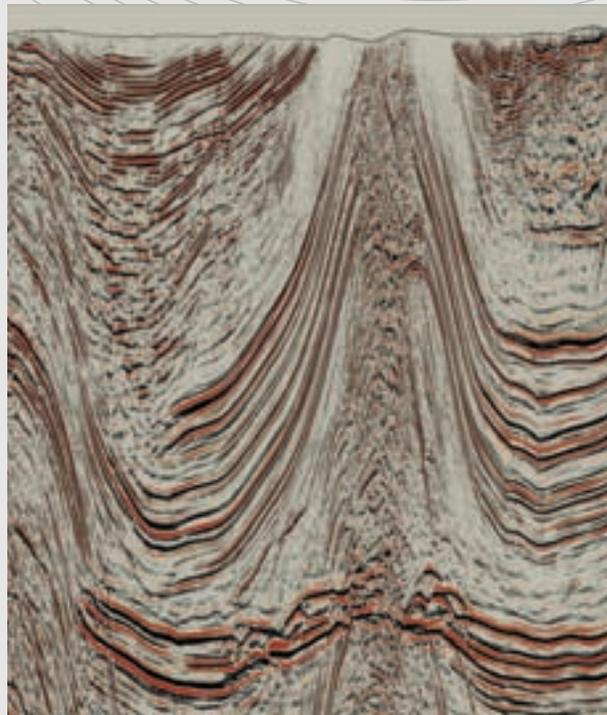
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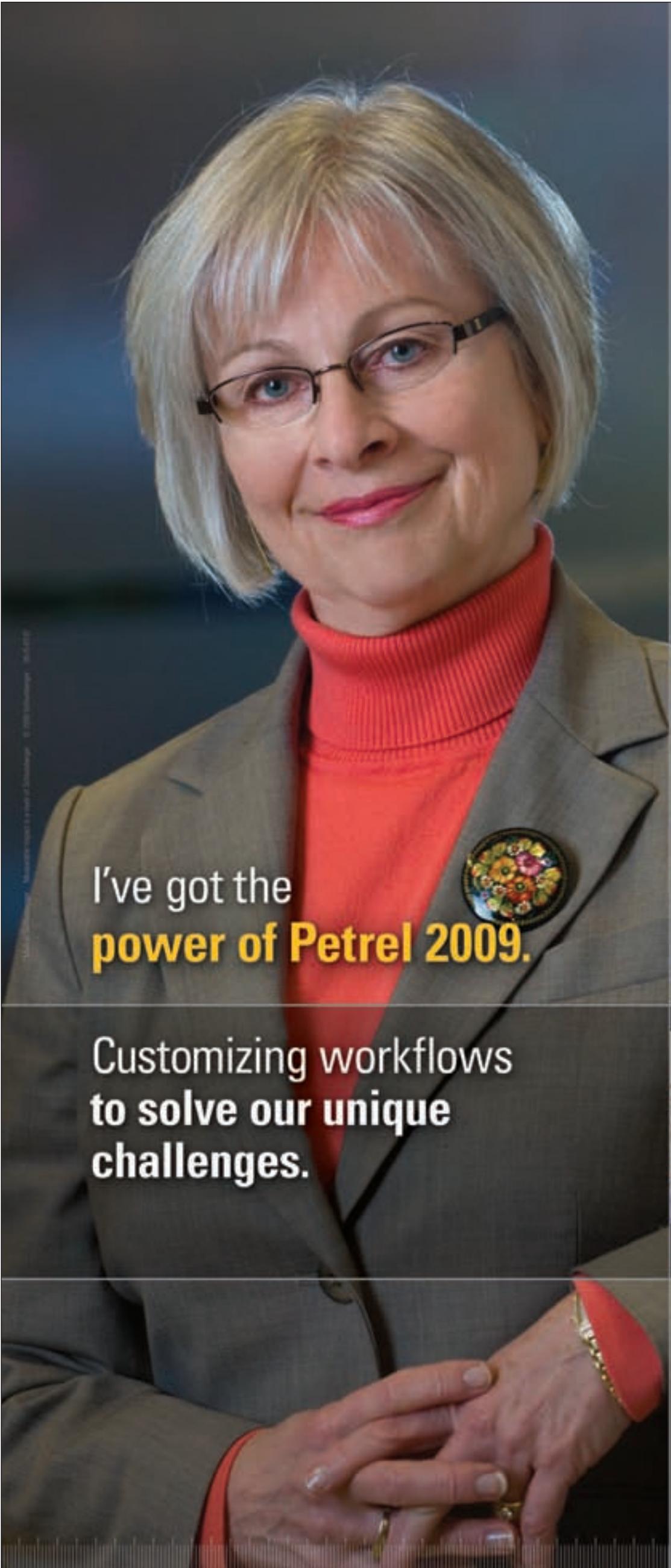
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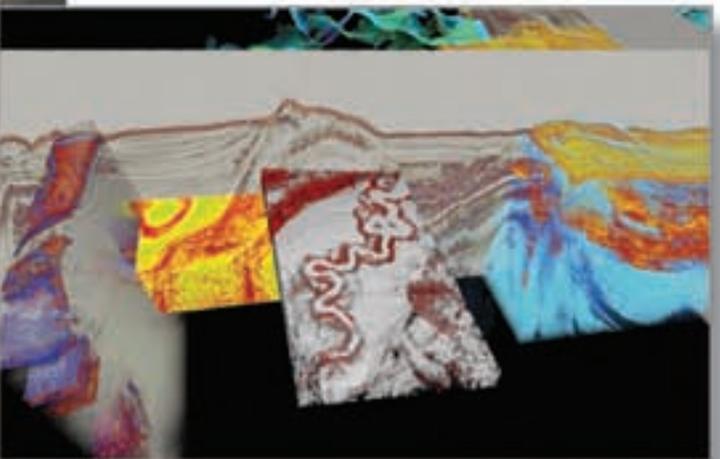
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Were 'Boom Prayer' Promises Kept?

By DAVID BROWN
EXPLORER Correspondent

You could see this bumper sticker, in one form or another, all over the oil patch after the price bust of the 1980s:

*Lord, Give Me One More
Oil Boom And I Promise
Not To Blow It Next Time*

Today, the industry has gone through one of its biggest boom-bust cycles ever.

A reminder (as if everyone needs it): West Texas Intermediate crude hit \$145.38 a barrel on July 3 last year and then nosedived to \$30.81 on Dec. 23. It was the end of another boom, and we had promised not to blow it.

How did we do this time?

According to the experts: Not too badly, overall.

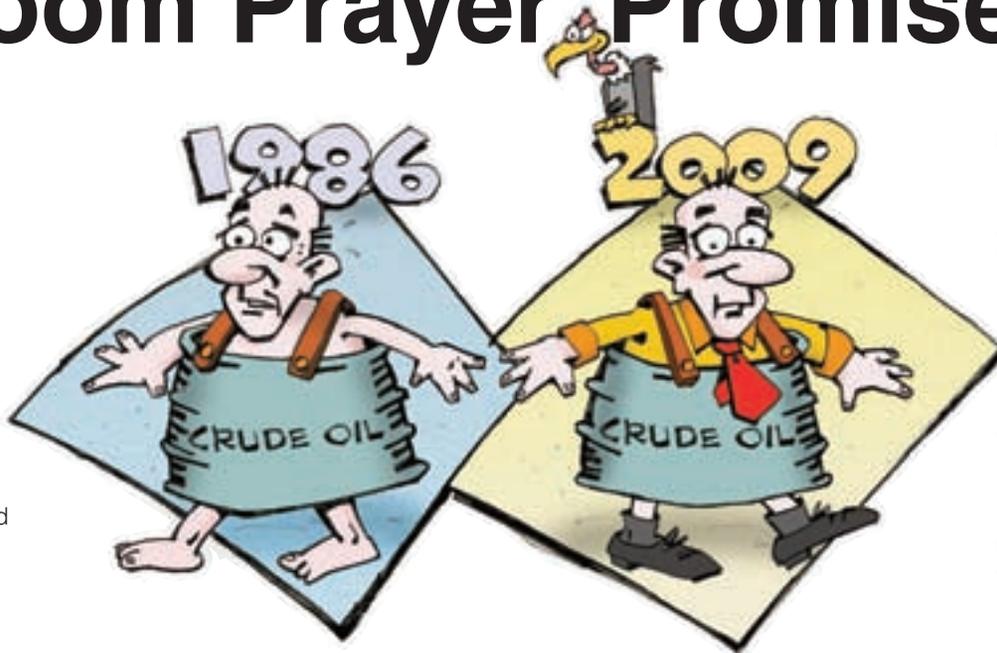
Tom Wallin is president of Energy Intelligence, which publishes both Oil Daily and Petroleum Intelligence Weekly and other energy market-related publications.

"People were more measured and more careful," Wallin said.

"There are a lot of similarities, but the industry has handled this one differently. Companies haven't been venturing off outside their comfort zone, buying Montgomery Ward or going off – with a lot of government encouragement – into things like oil shale," he noted.

(Editor's note: Mobil bought Montgomery Ward in 1976 and in 1988 was taken private after massive losses.)

The industry has shown both its resilience and its self-reliance, said AAPG



member Larry Grillot, dean of the Mewbourne College of Earth and Energy at the University of Oklahoma.

Grillot came to the university after a 30-year career at Phillips Petroleum Co., where he held several management positions, including international exploration manager and president of Phillips Petroleum Canada.

"The point I would make is, no one is having to bail out the oil and gas business yet. We've always taken care of ourselves," Grillot said.

"It's been painful – we've had to have cutbacks and layoffs," he added. "But we didn't have to go hat in hand to the government and say, 'Save us because the price went down 75 percent.'"

Lessons Learned

The oil and gas industry was criticized for several missteps during the previous boom-bust cycles.

One of the harsher complaints said oil companies hired too many people far too quickly in the up-cycles, then seemed far too eager to dump employees as prices fell.

That led to the widely recognized "age gap" and "crew change" challenges facing companies today.

"Essentially, many of the companies in the industry ceased hiring, to the point where a lot of petroleum engineering departments went out of existence," Grillot observed.

"I believe they're trying to manage that better, even as we speak," he said. "They know that hurt them the last time."

But Wallin noted that the down-cycle in the industry has just begun, and said "the jury's still out" on long-term employment effects.

He warned that another significant period of mergers and acquisitions could lead to increased layoffs.

"I think there's a strong possibility we're going to see consolidation in the industry. It just gets to be irresistible when share prices are beaten down to these levels," he said.

The industry seemed better prepared to handle success in the 2003-08 boom, not using extra cash to expand too quickly or to diversify into other businesses.

"This time they said, 'We're not going to go off and buy mining companies and get into areas outside our expertise,'" Wallin noted.

Major oil companies and other big energy players managed to keep their bearings despite pressure to overreach, according to Grillot. "There were a lot of politics being played" with significant political urging to drill recklessly, he noted.

"The markets and the analysts and Wall Street were really ding these companies that weren't going out there and making these exotic investments," he said.

As a result, the industry should be better off in the down-cycle this time around.

See **Cycles**, page 8

Brasil Deep Focus 2D Regional Long Offset

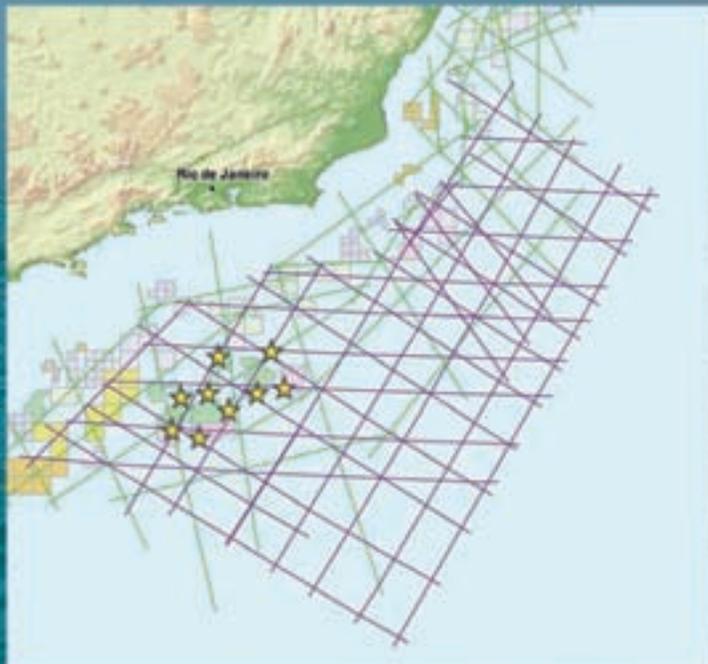


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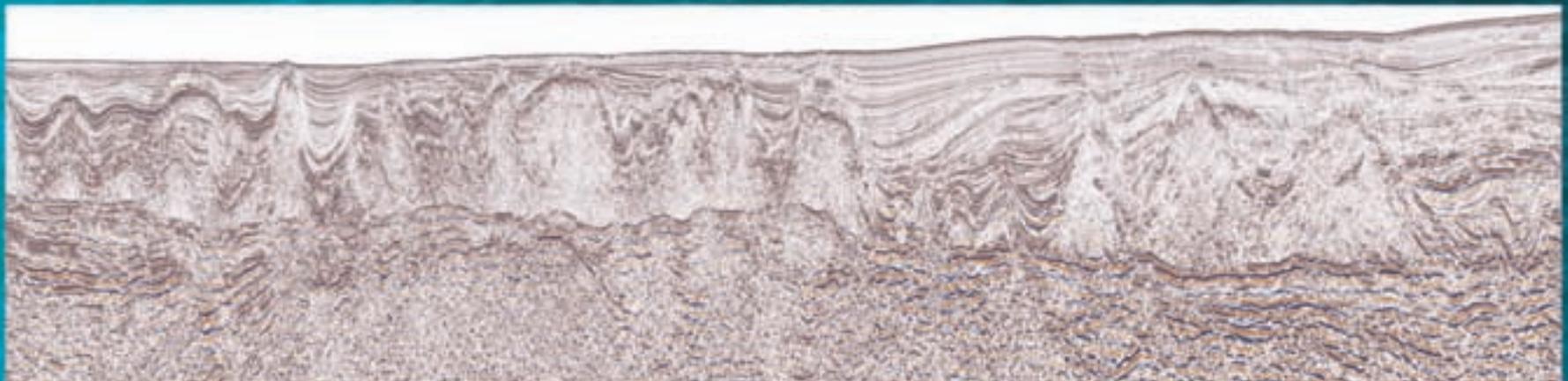


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Cycles

from page 6

"Most of the majors, even though they're getting hit, still are maintaining good balance sheets," Grillot noted.

Wallin said oil companies "were trying to be more prudent than they were in the last cycle," when they obviously learned some lessons.

"I think most companies, with a few exceptions, are better prepared to handle the downturn this time," Wallin said.

"There's going to be a period here where there's a readjustment that has to work its way through. The major oil companies are going to be in a stronger position than other industry players," he added.

He also sees strength in some large national oil companies, including Petrobras, Petronas and StatoilHydro. But

No one is having to bail out the oil and gas business yet. We've always taken care of ourselves.

companies like PEMEX and PDVSA will be challenged, he said.

"Their countries are going to be after them, to get everything out of them they can," Wallin explained.

"Also, I think the Russian companies are in a jam," he added, "because they have relied too much on financing."

Make More, Spend More

For some in the industry, "promising not to blow it" implied grabbing as much money as possible during the boom times. They'd forgotten that costs go up

concurrently with prices.

In recent years, the industry made more – and paid more.

"Now we're on the other side of that bell curve or that spike, and we're starting to see costs come back into line," Grillot said.

But Wallin doesn't expect costs for the industry to drop as drastically as oil and gas prices have over the last nine months.

"Will costs come down as much as energy prices have? I think that's unlikely," he said.

The brightest spot for the industry might be the tremendous advances in technology made since 2000, both

onshore and offshore.

And the effect on public perception in this cycle could be a draw, at worst.

People who were irate that "the greedy oil companies raised prices sky-high" should be completely confused by the huge price drop.

"The politicians don't do us any favors," Wallin noted. "It's very hard for them not to go into this sort of populist, anti-oil position."

Grillot judged the public's current perception of the industry as "same as always," which is not positive. He also chastised the government for its mixed message of energy independence, conservation and anti-industry rhetoric.

"Simultaneously with that, our policy is to keep gas prices as low as possible so people can drive anywhere they want," he said.

What About Tomorrow?

If the oil and gas business has come out of the boom-bust cycle in relatively good shape, can we expect easier times ahead?

Not so much, according to Wallin and Grillot.

High prices and increased demand during the boom strengthened the position of governments in relation to multinational oil companies.

In regard to oil supply, the industry faces a problematic future "with the whole cost structure having gone up, and the demand projection we see, and the failure to replace reserves in any big way," Wallin said.

"From our numbers and the way we look at things, we just don't see that much additional supply from non-OPEC sources, even if you add in Brazil and things like that," he added.

Multinationals will face "much more exacting terms and conditions and much more restricted access to reserves," he predicted.

Grillot agreed that "multinational companies have had trouble with worldwide build because of lack of access, as much as anything."

He also worries about the industry's commitment and ability to invest in infrastructure upgrades.

"Our infrastructure is long in the tooth," he said.

Just like other booms, the latest boom had its own silly season. Look at day rates in the Gulf of Mexico. Or lease bonuses in the Haynesville Shale play. Or predictions that oil prices would soar past \$200 a barrel.

"It was probably starting to be typical of, 'This is going to go on for a long time,'" Grillot said.

But this time around, the whole industry didn't go off the deep end.

"I would say 'blowing it' would be too severe. I think many companies were being very conservative in their investments," Grillot said.

"They were just starting to get more aggressive at the end of the year – at the end of the cycle," he noted.

When oil prices passed \$125 per barrel and the whole world said prices were bound to stay high, the industry's leaders surely thought, "We've been here before."

"If you think about it, the people who were running the oil companies now were all young executives in the 1970s and '80s. They probably learned from some of the things that have happened in the past," Wallin said.

At this point, the boom and bust cycle is a comfortable reality for the industry. Prices are sure to go up. Then lots of experts will give lots of reasons why prices will never go down. Then prices will fall quickly and deeply once again.

And then someone, somewhere, will write an article asking the question:

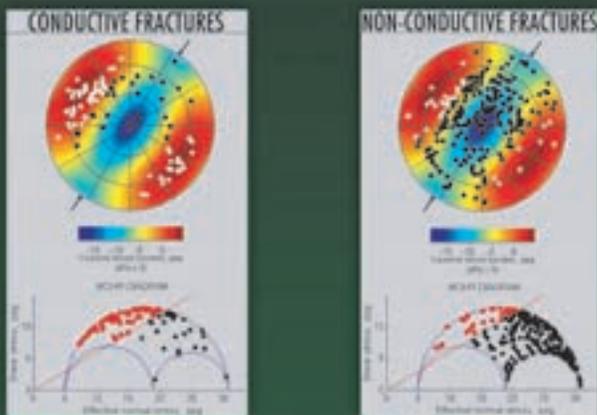
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Figuring Utah complexity pays big dividends**Understanding Model a Challenge**

By DAVID BROWN
EXPLORER Correspondent

More than five years after making one of the more startling oil discoveries of all time, Wolverine Gas and Oil Corp. is starting to nail down what kind of prospect it has.

That's no exaggeration.

Wolverine shocked the industry by discovering the 100-million-barrel Covenant Field in central Utah's hingeline area in December 2003.

AAPG member Keith Johnson, manager-geophysics for Wolverine in Grand Rapids, Mich., said the company and its new partner Oxy USA have acquired 100 miles of 3-D seismic over the original producing field and are completing initial processing.

"We feel like we have a pretty good idea of what the general structural framework is now," Johnson said.

"The real key is going to be the 3-D seismic migration – prestack time and possibly prestack depth migration," he noted.

Johnson confirmed that the company has made a second discovery on its 104-square-mile Federal Unit in Utah.

"We drilled two dry holes in the unit. One was the Twist Canyon 16-1 well in 2005 and the other was our Glenwood 10-1 well in 2006," Johnson said.

"Then we stepped out to the north and made a discovery in what we call our Providence Field," he said. "We have one well now that has tested oil and gas from two separate zones."

The Covenant Field discovery well found a 487-foot Navajo Sandstone oil column at a measured depth of 5,846 feet in Sevier County, Utah. A classic and excellent reservoir sandstone, the Navajo in the area is 97 percent frosted quartz grains with an average 12 percent porosity, composed mainly of aeolian dune sets.

The Providence discovery well encountered an Upper Navajo sand at a measured depth of 8,853 feet and a second sand, probably also Navajo, at 12,121 feet, according to Johnson.

"We're just in the process of drilling our first confirmation well" at Providence, he said.

A Lot of Challenges

When the company made its Covenant find, the public reaction was "There's oil in central Utah!" while the industry reaction was more along the lines of, "There's oil in central Utah?"

As Covenant and Providence prove, there's oil and gas to be found. Today, the search for additional fields makes a challenging Easter egg hunt in one of the more complex play areas of the United States.

"I would say the biggest challenge is understanding the petroleum systems model, determining how the hydrocarbons migrated to that area and how they might be trapped," Johnson said.

The overthrust belt relevant to the play begins in southern Nevada and curves through central Utah, western Wyoming and Montana and into Canada. Most of the oil and gas fields in the thrust have actually been discovered in Canada.

Johnson said the bedrock geology in central Utah was mapped by Clarence Dutton in 1870.

"This anticlinorium where the thrust structures go through was known from the surface geology, or was strongly



Photos courtesy of Wolverine Oil and Gas

Where it all began – and continues: A seismic shot crew at work on a Covenant Field in Utah, where 100 miles of 3-D seismic data have been acquired over the original producing field. Officials now have "a pretty good idea" of the general structural framework.

suspected," he noted.

Wolverine's Federal Unit is about 37 miles long and three miles wide, Johnson said. Identified structures are expansive.

"Primarily, they're on the order of four miles long and a couple of miles wide

over this unit," he said. "The structures are fairly large."

That can be a challenge for seismic imaging, which has to stretch over the entire structural length.

"You have to shoot long lines," Johnson said. "I use 10 miles as a

minimum."

The seal rock in the central Utah Navajo sand oil play is the Arapien Formation, which presents another seismic challenge.

"On top of the Twin Creek/Navajo Formation is the Arapien, a mixture of carbonates, evaporites and clastics. It's all tectonically thickened and disharmonically folded – it's a mess," Johnson noted.

"It's full of bright reflectors and it's difficult to image through, primarily because of the steep dips," he said.

Wolverine's unit is almost all government land – about half federal, 34 percent state and 16 percent private. Wildlife protection restrictions and other regulations limit seismic acquisition to six months of the year, Johnson said.

"When we shoot seismic, we have to jump through all the hoops that everybody else has to when shooting on government lands," he said.

Because of the rough topography of the play area, helicopter support has become a must, according to Johnson. Many shot holes are drilled by heliportable drilling rigs.

Wolverine now has acquired 3-D seismic on about a third of its Federal Unit, but it holds a sizable amount of 2-D data. The company purchased some of that data along with its leasehold.

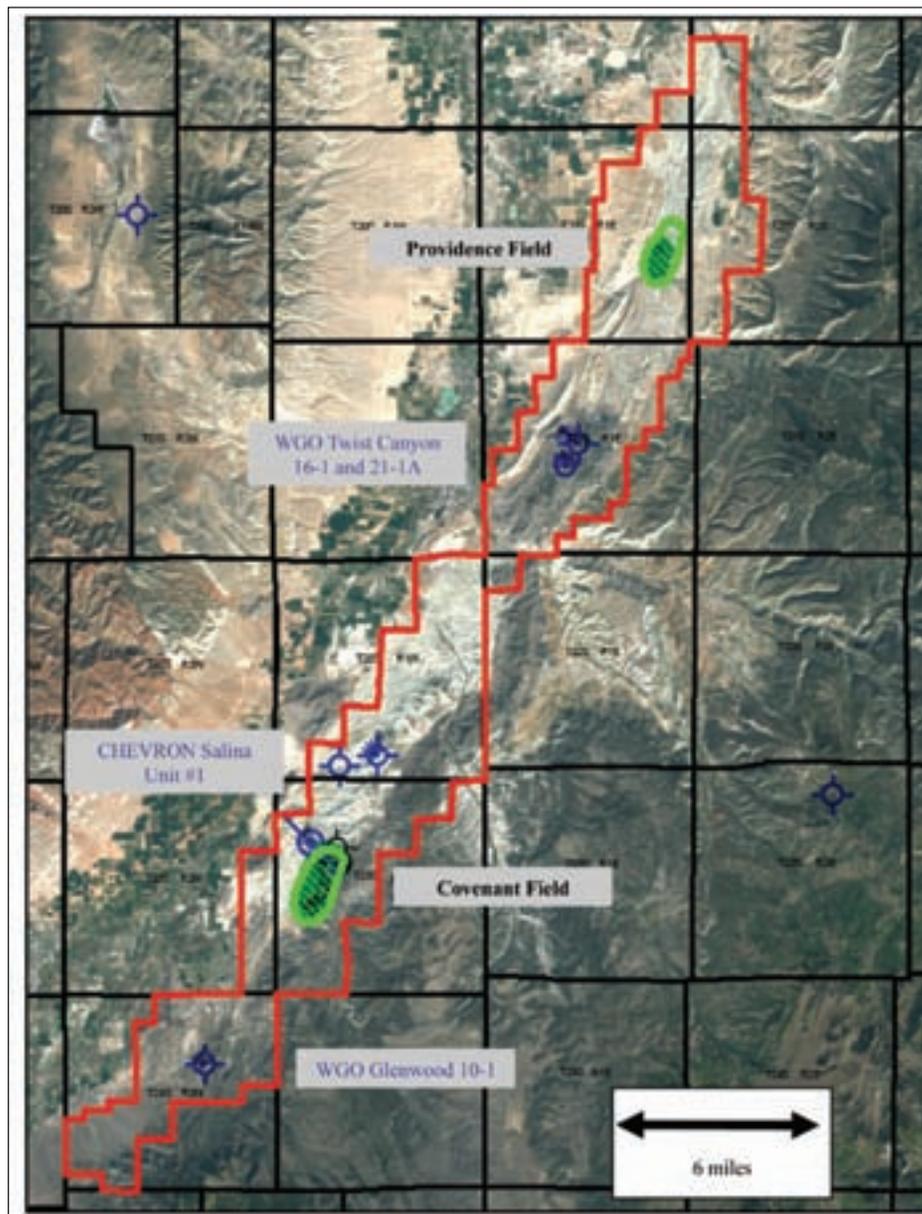
Proof

Johnson said Chevron was looking to divest its Utah leases in 2000. At that time, central Utah was known more for its Cretaceous dinosaur eggs than its Jurassic reservoir possibilities.

Wolverine had been evaluating coalbed methane opportunities in the region.

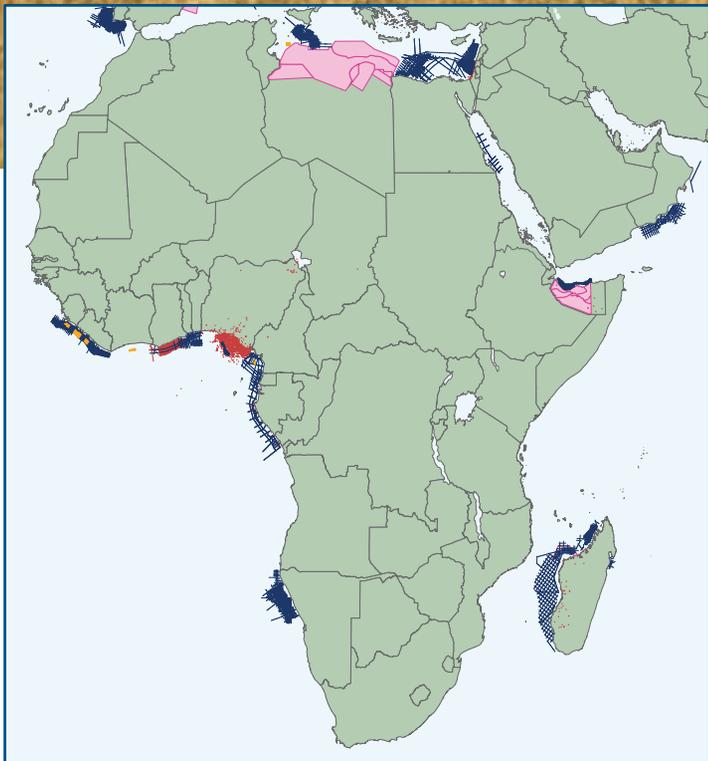
AAPG member Doug Strickland, the company's exploration manager, had worked as a Chevron geologist and was already familiar with the area from his university studies.

Wolverine acquired Chevron's lease



See **Utah**, page 12

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Utah continues to be among the industry's most intriguing exploration stories, and the challenging landscape is just part of the reason why. Helicopters and buggy drills are helping to get the data to make the region's potential a reality.

Utah

from page 10

position in April 2000 and began mapping the thrust sheets to develop a prospect.

"We started out with a very meager seismic grid," Johnson recalled.

When the Covenant oil find was first announced, some skeptics said the area was too barren of hydrocarbons to produce a future string of discoveries.

Johnson said just the opposite is true.

"Seismic interpretation was a little bit difficult because of the lack of well control out here. There were only two wells that penetrated the Navajo over our entire unit, and those wells were only about a

mile apart," he said.

Only 19 wells had reached the Navajo in the entire central Utah area, Johnson said.

The Covenant discovery was on the leading edge of the Sevier thrust belt, following a northeast-southwest hingeline that influences local stratigraphy.

It could be considered on-trend with other production along the thrustbelt, but the closest analog wells are a considerable distance away, Johnson noted.

"When we made the Covenant discovery, the nearest analog production was 146 miles to the northeast, in the Pineview Field," he said.

Tectonic shifts, folding, faulting, two major orogenies and other events have made the central Utah hingeline area a geological crazyquilt. Picture a plate of scrambled eggs in a cubist painting

by Picasso.

With the initial discovery, Wolverine had to answer the question: "Where did all this oil come from?" Geochemistry studies have fingerprinted the oil as organic carbon-rich, Mississippian-age crude from source rock in western Utah and eastern Nevada.

Johnson said the primary period of migration can be identified but "the problem is, most of the thrust structures are moving after that," likely leading to re-migration.

Wolverine invested 39 months of initial evaluation in its acquired Chevron acreage, including seismic reprocessing and geochemistry work.

"We spent almost two years putting together the petroleum systems model to prove to ourselves that there was hydrocarbon potential before we took it to the industry," Johnson said.

Back to the Drawing Board

Based on that understanding, the company was convinced it had a legitimate natural gas play in central Utah. Wolverine put together the parcels to complete its Federal Unit and offered an exploration package proposal to the industry.

To overwhelming disinterest.

In 2002-03, the Wolverine Salina Prospect was shown at two North American Prospect Expos, and the Calgary Prospect Exchange, and was presented to 65 major and independent oil and gas companies. Wolverine finally managed to sell a 75 percent working interest at cost to 14 partners, including "business friends."

continued on next page



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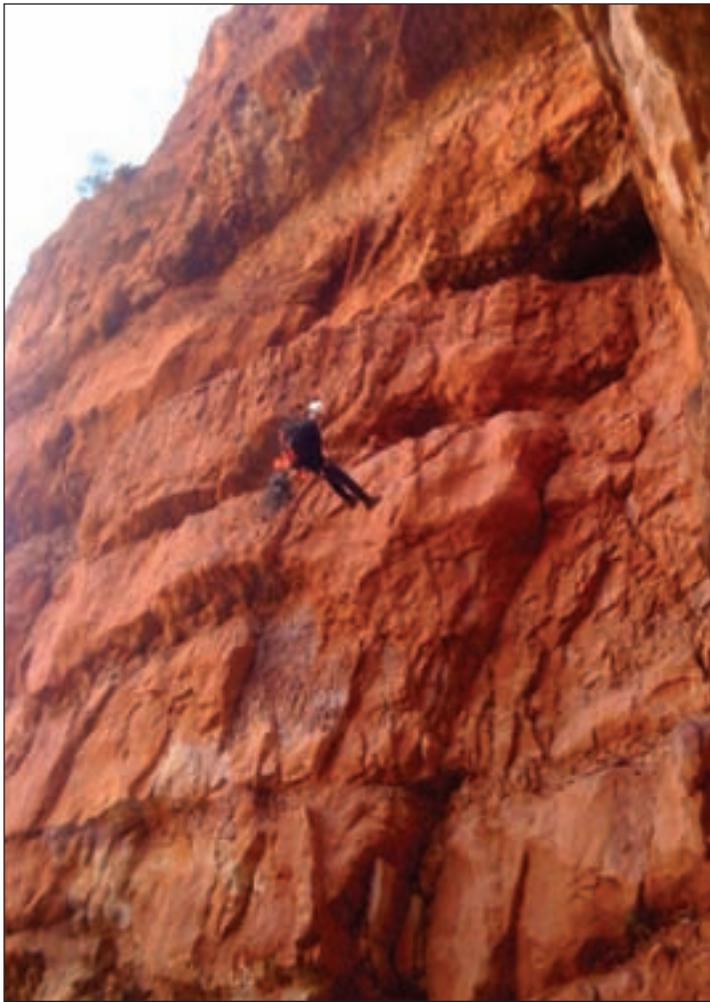
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Look out below: Some jug hustlers have to stomp through a swamp, and some get to test their rappelling skills. This juggy got an up close and personal experience with Utah's spectacular geology while scaling a cliff – all part of the industry's effort to better understand the state's complex geology.



continued from previous page

One of the problems may have been the amount of drilling potentially required to develop information about the unit's chances for production.

"It's a large area and we knew it was going to take a lot of exploration out here," Johnson said.

As it turned out, another possibility was discovering a significant amount of hydrocarbons-not natural gas but oil with associated gas – on the very first test well drilled on the first prospect structure.

In a way, that sent Wolverine back to the drawing board. It was a good example of the exploration truism that you think you know what you're doing, then you find out a few facts about real-world conditions, and then you start to

realize how much more you need to know.

With the potential for so many eggs in its basket, Wolverine brought in Occidental Petroleum subsidiary Oxy USA as a partner in the play.

It also began the task of developing a modified petroleum systems theory, to account for the oil and newly acquired geological information, and started accumulating 3-D seismic.

Now, more than five years after the Covenant discovery, the company is nearing completion of its first comprehensive, 3-D-based picture of the area.

With two producing fields already found and more than 100 square miles to explore, it's bringing renewed interest to prospects for oil and gas in central Utah. □

Western Rig Counts Show Drop

Statistics don't lie?

There's a classic "Peanuts" comics episode in which Charlie Brown, after enduring Lucy's explanation of the numbers behind her club's won-loss record, says, "Tell your statistics to shut up."

So while current U.S. rig count numbers don't lie, they may not tell the whole story, either.

"The rig count decline is not only a function of lower commodity prices but also a good indicator of how to balance to the market," said Roger Read, senior energy analyst at Natixis Bleichroeder. "The decline is part of bringing supply and demand back into balance."

And according to Baker Hughes Investment Relations, decline it has been.

The company's data, traditionally a marker of industry health and vitality, showed a global decline in rig counts, from 7 percent from January to February; the decline from February 2008 to February 2009 was almost 20 percent.

Internationally, the rig count in February was down by 664 over the previous year.

In the United States alone, the drop was 15 percent from January and 25 percent from February 2008. Additionally, there are 520 fewer rigs being operated in the United States this year compared to last. The total stands now at 1,243.

Since 1940 the highest weekly U.S. rig count was 4,530 (December 1981); the lowest count was 488 just two years earlier.

Looking specifically at the western United States, here's how the February 2009 rig counts compare to those of one year earlier:

- ✓ Colorado – down 48.
- ✓ Montana – no change.
- ✓ New Mexico – down 29.
- ✓ Wyoming – down 23.
- ✓ Utah – down 1.

In the largest oil and gas producing states, the numbers for the same period are:

- ✓ Texas – down 321.
 - ✓ Alaska – down 11.
 - ✓ Oklahoma – down 80.
 - ✓ Louisiana – no change.
- BARRY FRIEDMAN

April 2009

Midland Valley

Structure World

In April's edition of Structure World we open registration for our September Technology Meeting and our interpreters tip looks at strike-slip geometries.

Registration for our 2009 Technology Meeting opens: come home to Scotland



This year's meeting, "Structural Geology for Uncertain Times", will take place in the Glasgow Science Centre (UK) on 15th - 16th September 2009.

Sessions covering the oil, gas, carbon storage and mining industries will include papers from both industry and academic speakers. Confirmed speakers include John Wheeler, Liverpool University; Simon Stewart, Heriott Watt University; and Alan Roberts, Badley Geoscience. If you would like to be considered to present a paper send us your abstract before 30th April to the email address below.

A full programme including technical sessions, field trip, training courses and additional activities will be available in the coming months.



Also taking place this year is Homecoming Scotland 2009, a Scottish Government initiative celebrating the 250th anniversary of the birth of Scotland's national poet, Robert Burns. From Burns night to St Andrew's Day 2009, a country wide programme of exciting and inspirational events and activities will celebrate some of Scotland's great contributions to the world: Burns himself, Whisky, Golf, Great Minds and Innovations, and our rich culture and heritage.

As many of our clients know, since our inception Midland Valley has been fully supportive of the contribution of Whisky through our events and our Technology Meeting 2009 will be no different!

For further details on the meeting and registration email events@mve.com or visit our website www.mve.com.

Interpreters Tip: Strike-slip faults and basin compartmentalisation

Strike-slip faults are an important factor in basin compartmentalisation, but identifying these structures in 2D and 3D seismic is non-trivial. On a regional scale strike-slip faults are commonly associated



Illustration of a strike-slip/transfer fault showing transtension and transpression.



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with pull-apart basins at releasing bends (transtension) and uplifted fold packages at constraining bends (transpression). It is also worth remembering that strike-slip/transfer faults are an important component of linked fault systems in both compressional and extensional terrains.

Common characteristics of strike-slip systems in cross-sections are sub-vertical faults, lateral thickness changes across faults that have little to no apparent throw, and strike-slip duplexes or 'flower structures' associated with restraining or releasing bends in the fault. In cross section flower structures exhibit upward diverging fault splays that are typically concave upwards or downwards, reflecting negative and positive flower structures respectively.

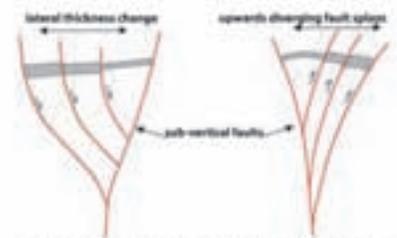
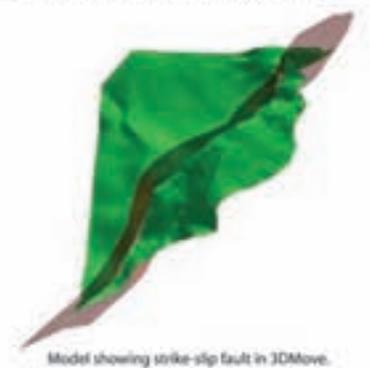


Illustration showing common features associated with positive and negative flower structures in cross-section.

Correctly identifying strike-slip faults from seismic cross-sections can be aided by visualising the model in 3D space. The 3DMove and MoveViewer components of Move2009 allow users to visualise and interrogate the 3D model, combining additional information such as topographic data, to examine strike-slip fault orientation and lateral continuity.

3DMove has a range of advanced restoration tools designed to validate and restore fault block movement, including strike-slip faults. Restoration algorithms in 3DMove, such as Inclined Shear and Fault Block Restoration, can be used to undeform and restore movement along strike-slip structures in 3D models.



Model showing strike-slip fault in 3DMove.

To find out how to use **Move** in your interpretation and validation, contact help@mve.com.

Enhanced Interpreters Tips and more on Midland Valley website

For the past few months we have been working behind the scenes creating a new look for our website. By the end of this month you can find developed versions of the interpreters tips with bigger diagrams, a client FAQ noticeboard, Move workflows, a dedicated academic and research area and an improved client secure section. Visit our new site www.mve.com.

www.mve.com
The structural geology experts

Cable-free 3-D VSP, OVT**New Seismic Technologies on Trial**

By LOUISE S. DURHAM
EXPLORER Correspondent

Take a field rife with infrastructure and in a particularly sensitive environment, deploy a cable seismic system and...

Ouch!

The data acquisition process can be unbelievably tedious – and the imaging maybe not the greatest.

As a result, companies are showing increasing interest in new cable free systems.

In addition to commercially proven nodes for marine acquisition, cable-free land systems, such as Fairfield's Z Land and ION's FireFly, are also generating buzz among the industry players.

A world-first deployment of cableless full-wavefield single sensors in a 3-D onshore seismic survey took place in the winter of 2006-07 at the BP-operated Wamsutter Field in Wyoming.

The operation used the FireFly system and was part of a seismic field trial that also included the largest onshore U.S. 3-D VSP, according to AAPG member Craig Cooper, land seismic project coordinator for North America gas business unit at BP.

The field trial's intent was to test the viability of emerging seismic technologies and to enhance understanding of the value of seismic data as a development tool for reservoir and fracture characterization – not just in the Wamsutter Field but in tight gas plays in general, Cooper noted.

Made-to-Order Locale

When you consider the challenging scene – Wamsutter is a heavily developed

Handling (the environment) with care: Orange heli-bags holding multiple Firefly units and Vectorseis sensors line the Wamsutter horizon.



Photos courtesy of ION

active field, and Wyoming is a kind of environmental hot-bed – this is a made-to-order locale to test an acquisition system sans cables.

The primary reservoirs at Wamsutter are the Cretaceous Almond sands, which have a gross interval thickness of 500 feet and occur at an average depth of 10,000 feet.

In the locale of the seismic action, the Almond play is a heterogeneous, thin-bedded reservoir comprised of lower coastal plain shallow marine sands, shales and coals. This makeup presents a complex challenge to well-based predictions and to seismic imaging in the

inter-well areas, according to AAPG member Rosemarie Ramkhelawan, senior geophysicist at BP.

The first order of business at the field trial focused on the 3-D VSP, which was acquired in a single borehole.

"The shot coverage was almost the same as the full seismic survey," Ramkhelawan said. "What makes it 3-D is, instead of just shooting a line of shots, they shot a big



Ramkhelawan

areal patch of shots into a single borehole that had many, many receivers in it."

The VSP was acquired with 8,000 feet of receiver tool having 160 3C geophones spaced 50 feet apart, from a depth of 2,500 to 10,500 feet, according to Ramkhelawan.

"This is the largest geophone array ever deployed in a single borehole," she said, adding that the data processing using all three recorded components resulted in excellent quality P-wave imaging.

"The achievable bandwidth is double that of the surface seismic, allowing more detailed mapping of the internal character of the Almond interval," Ramkhelawan said. "Nine surfaces are interpretable on the VSP data within the Almond interval compared to four to five on the surface seismic data."

Making Informed Choices

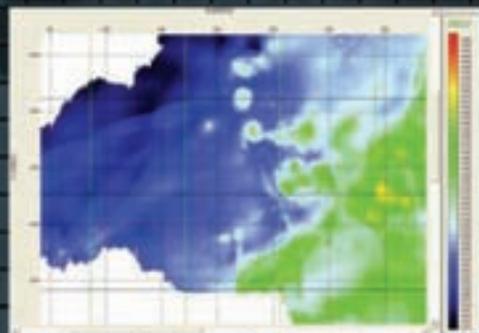
The surface survey using the FireFly system and 3-component VectorSeis sensors was implemented by Global Geophysical Services and was centered on the VSP, covering a circular area of approximately 28 square miles.

The uncooperative participant was Mother Nature.

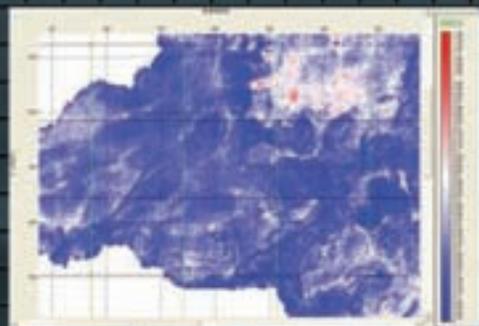
"There were challenging conditions," said Alex Calvert, full-wave land R&D manager at ION. "Usually Wyoming is dry, but that winter it snowed significantly.

"This slowed things a bit," he added, "but they still were able to acquire the full

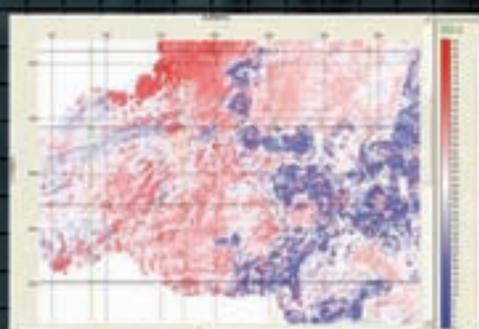
See **Wamsutter**, page 16



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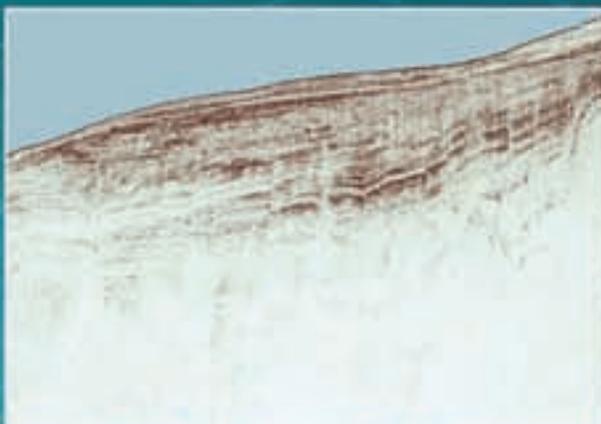
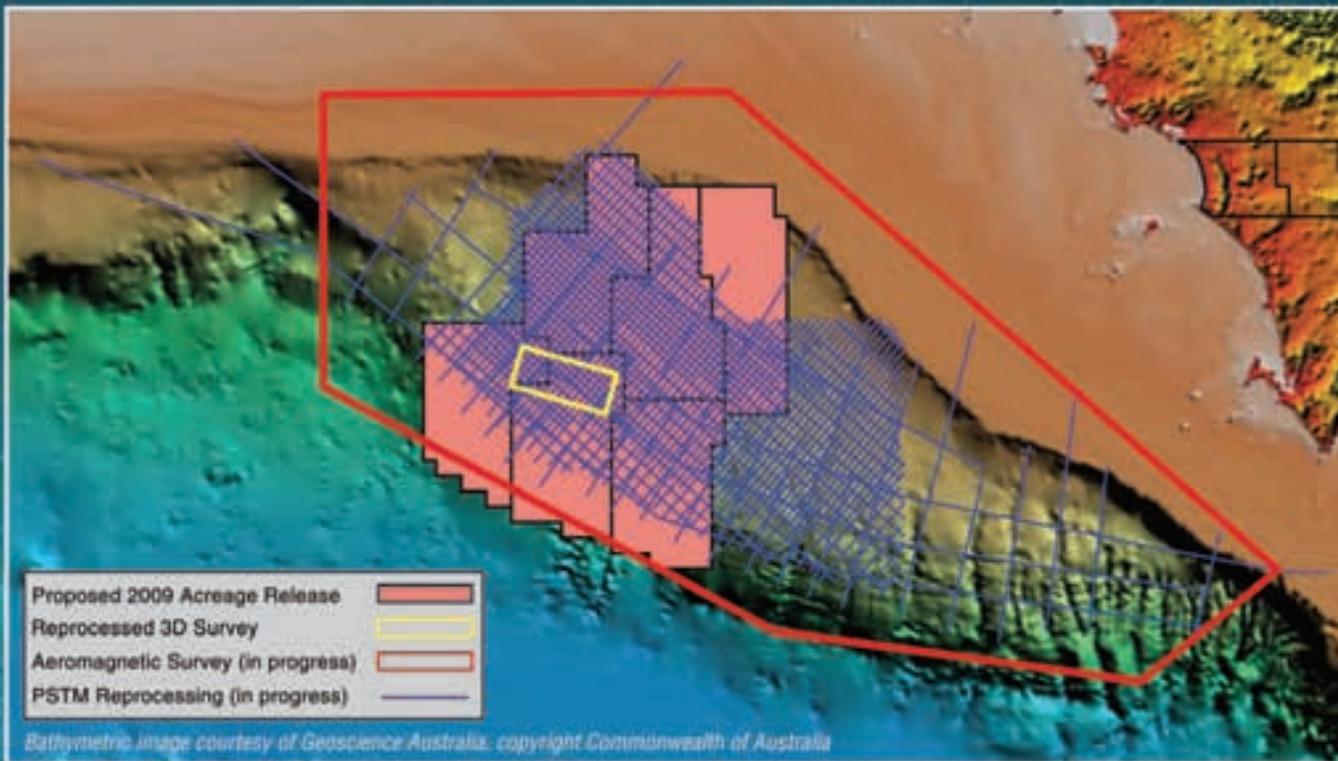
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- Integrated interpretation report



Before: Flinders Open File Seismic



After: Flinders PSTM Reprocessed Seismic

The Ceduna Sub-Basin is included in the 2009 proposed acreage release, to be officially announced at the APPEA conference on May 31st. Geoscience Australia have recently published results from a geological sampling study, with promising evidence for a world class Cretaceous source rock. The non-exclusive data package provides a superior starting point for evaluation of this exciting frontier region.



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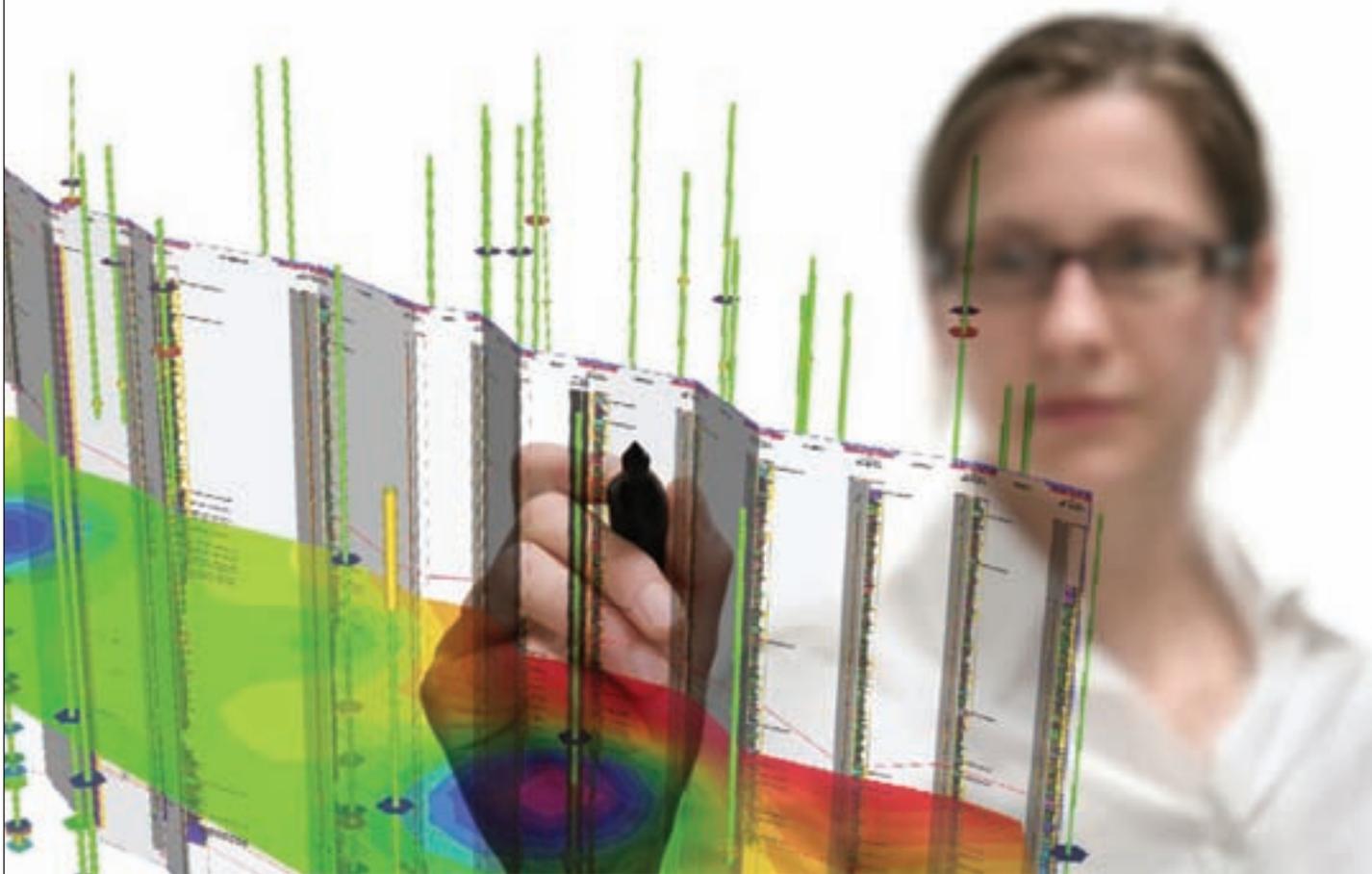
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Heli-bag and some locals (left), and a deployed Firefly unit and Vectorseis sensor: The Wamsutter is a heavily developed active field, and Wyoming is a kind of environmental hotbed, which adds up to a made-to-order locale to test an acquisition system sans cables. The tests, incidentally, were a success.

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Wamsutter from page 14

survey in less than 10 days of shooting time."

Despite the challenges that included high winds generating significant noise and battery depletion associated with burial beneath the heavy snow, the operation successfully delivered a unique high density, full azimuth, full wavefield data set for analysis, according to Calvert.

A processing flow was designed to provide BP with a quick early look at the data and also to test a number of emerging technologies.

One of these is OVT (offset vector tiling), which preserves offset and azimuth integrity.

"This (OVT) has actually been around since the early '90s," Calvert said, "but hasn't really taken off."

"I think there are a number of reasons for that," he said, "with one of them being that some of the surveys at the time weren't dense enough to sort in the OVT domain – but this one was suitably dense."

"Also, the processing tools that were around at the time weren't well suited to the sort of wide azimuth data sets this processing approach produces," Calvert added.

He noted there is a growing realization that azimuthal anisotropy, which is the variation of seismic velocities as a function of direction, can provide insights into potential fractures that control well recovery and also stress that controls well fracturing.

"OVT lets you analyze this azimuthal anisotropy after migration, and that's potentially very valuable to the clients," he said. "That takes out some of the first order structural effects that can be a problem."

Ramkhelawan noted that the field trials enabled BP to study the seismic response, understand how the reservoir heterogeneity was setting up the response and to make informed choices around how and where to employ enhanced seismic imaging as a tool.

This knowledge is looked on as a large step change for the asset.

"It has been one of a number of factors enabling BP to move to a pad development approach," Ramkhelawan said, "batch drilling the low risk areas of the field and releasing skilled resources to focus on the higher risk, more complex opportunities around the core area." □



Calvert

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Bonanza to Little House on the Prairie

Low Prices Hit State Coffers

By BARRY FRIEDMAN
EXPLORER Correspondent

Last year, when the price per barrel hovered around \$150 a barrel, oil producing states in the Rocky Mountain region were swimming in black ink, energy companies were being vilified as being greedy and the industry seemed on its way to even bigger spending this year.

And now for a cliché: What a difference a year makes.

With the price per barrel wallowing between \$30 and \$40 per barrel, the industry, temporarily at least, is off the public relations chopping block. The good news is, the industry is no longer the villain. The bad news: There's a whole bunch of bad news out there.

And nowhere is that bad news more immediate than in the spending budgets of oil producing states, including those in the United States' Rocky Mountain region.

There are several ways to quantify just how bad the news might be, but one easy way is by taking a look at drilling activity – and in this case, the rig count statistics show a drop, sometimes dramatic, from last year levels (see story, page 13).

Unrest in the West

The general consensus among western state officials is that everyone could live, and would be more or less happy, in the \$60-80 range.

In Alaska, for example, where oil funds 90 percent of the state budget, legislators built proposals and legislation on an average of \$82 per barrel price.

Unlike Alaska, which has a \$5 to \$7 billion rainy day fund as a cushion, the states listed below have more rain, if you will, than umbrellas.

A brief rundown of conditions in the western United States includes:

✓ **New Mexico** – According to the New Mexico Independent, the oil and gas industry makes up 18 percent of all state and local revenue, which explains, in part, why the state has an estimated \$454 million budget shortfall for fiscal year 2009.

To put it succinctly: "New Mexico is facing a deficit because of low oil and gas prices," wrote Deborah Seligman, the state's vice president of governmental affairs.

✓ **Montana** – In 2008, with a barrel of oil hovering at near \$140, Gov. Brian Schweitzer was salivating at the 40-billion barrels of oil that were possibly lodged in the eastern part of the state. Today, with oil at less than \$50, the urgency is gone.

More troublesome is that the decrease in oil and gas revenues has contributed to the state's \$250.9 million revenue decline.

✓ **Wyoming** – The state hasn't experienced the monetary shortfall as significantly as other states, but it has seen a 28 percent drop in drilling permits over the past year, which, while not a definite trend, according to officials, is troublesome nonetheless, especially considering crude oil and/or natural gas is produced in 20 of



Wyoming's 23 counties.

Further, and anecdotally, a recent Bureau of Land Management sale of 137 oil and gas parcels around the state recently netted approximately \$2.4 million – and that amount is down 87 percent from a similar sized lease sale conducted last year that netted about \$18.3 million.

✓ **Colorado** – According to a report in The Denver Post, both the state and the industry are feeling the pain of reduced revenues.

Companies reportedly are slashing operating budgets, and according to the Center on Budget and Policy Priorities, smaller oil revenues will be a factor in the state facing a \$604 million budget gap.

✓ **Utah** – The state faces a \$302 million deficit for the fiscal year, or about 10 percent of the total state budget, and analysts there point to the decrease in oil revenues.

And while production volumes have not dropped significantly, John R. Baza, director of the state's division of oil, gas and mining, says, "Already with the current oil and gas prices we have seen a 50 percent drop in our statewide rig count, from a high of 50 rigs in August 2008."

He went on to say that his regulatory permitting statistics were highest in 2006 when price was in the \$60-\$65 per barrel range, which is where he believes the target should be.

"I think it needs to stay in that range to encourage significant exploration in Utah," Baza said.

Who Knows?

Nationally, the drop in oil prices has had a sort of yo-yo effect on the economy. People like the lower prices at the pump, but the incentive to find new and alternative fuels isn't as great.

The good news, though, is that analysts believe that today's low oil prices will start to rise as soon as international government bailouts take effect. AAPG member T. Boone Pickens predicted at the end of February oil will climb back to \$75 barrel by the end of 2009.

Long-term he's even more bullish. "If you don't think we'll see \$200 to \$300 oil in 10 years, you are kidding yourself," he said. "You think OPEC is a free market? We have no control over what is going on."

Of course he, and everyone else, has been wrong before.

As Utah's John Baza says, "Based on my past lack of success at predictions, I had better remain silent." □

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*Patent pending

*A good look inside a crater***Red Wing Data Has Big Impact**

By BARRY FRIEDMAN
EXPLORER Correspondent

What the Red Wing Creek Field, located within North Dakota's oil-rich Williston Basin, has been doing since its discovery in 1972 is not the story.

In fact, the nine-kilometer diameter creek structure has been producing oil – lots of it, approximately 17 million barrels, most of it in the Mission Canyon and Charles formations.

This story, though, isn't just how much more is down there, but how we see it. Literally.

Since 2001, a 3-D seismic data set has been employed to better interpret the images and complexities of the site.

And that can mean more oil – and that's the point.

Paul Weimer, professor at the University of Colorado Department of Geological Sciences, past AAPG treasurer and co-author of a paper explaining what has been distilled from this 3-D imaging, believes this data "across a producing meteorite impact field" is some of the most important ever produced for impact craters.

Weimer and AAPG Student member Ben Herber were two of the authors of a paper on the project presented last month at the annual 3-D Seismic Symposium in Denver. The project is part of Herber's master's thesis.

Specifically, the 3-D data has been used to better understand the distribution of the extensive fault patterns, with an emphasis toward better field development.

Seismic intersect image, Red Wing Creek Field.

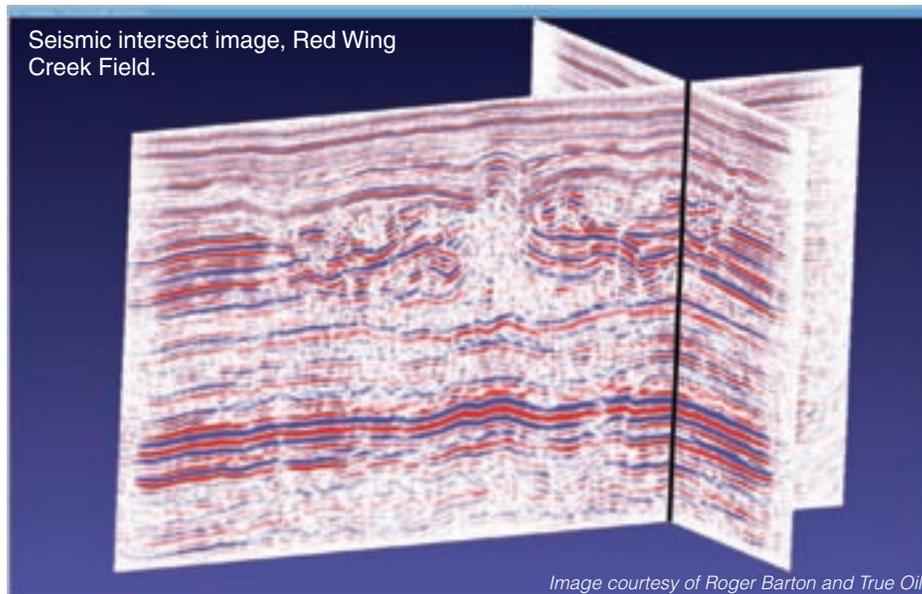


Image courtesy of Roger Barton and True Oil.

"The 3-D data," Weimer said, "have allowed us to better image the field in greater detail than was previously possible."

A Gift From Above

Weimer says the Red Wing Creek Field is one of a handful of oil and gas fields in the world that is known to produce from a structure that formed associated with a meteorite impact. In addition to the barrels of oil, the field also has produced approximately 25 Bcf of gas from 26 wells, of which 22 are still producing.

Of the competing claims as to what

might have caused the field, Weimer brushes aside all other theories, especially about this field.

"The 3-D seismic data unequivocally demonstrate that Red Wing Creek is a meteorite impact feature," he said.

The data, he added, will go a long way toward enabling the ultimate recovery of the field, a recovery which may be as much as 60 million barrels of oil – meaning more than 70 percent of the field is still untapped.

This is possible because the data illuminates the impact crater in more detail than what was presently known.

Experts in the field have known the



The poster "3-D Interpretation of a Meteorite Impact Field, Red Wing Creek Field, Williston Basin, Western North Dakota" will be presented Tuesday afternoon, June 9, at the AAPG Annual Convention and Exhibition in Denver.

crater consists of a structurally high central core with two surrounding structurally high areas, and an inner and outer rim. The total deformed area is about 65-square-kilometers; the central core area is 2.6-square-kilometers.

"Production is primarily from reservoirs in the central core that consist of highly deformed carbonate strata of the Upper Mississippian Madison/Mission Canyon Formation," Herber said, "and occurs from highly fractured strata with less than 1 mD of permeability."

"What we're trying to do," adds AAPG member Roger Barton, chief geologist

See **Red Wing**, page 24

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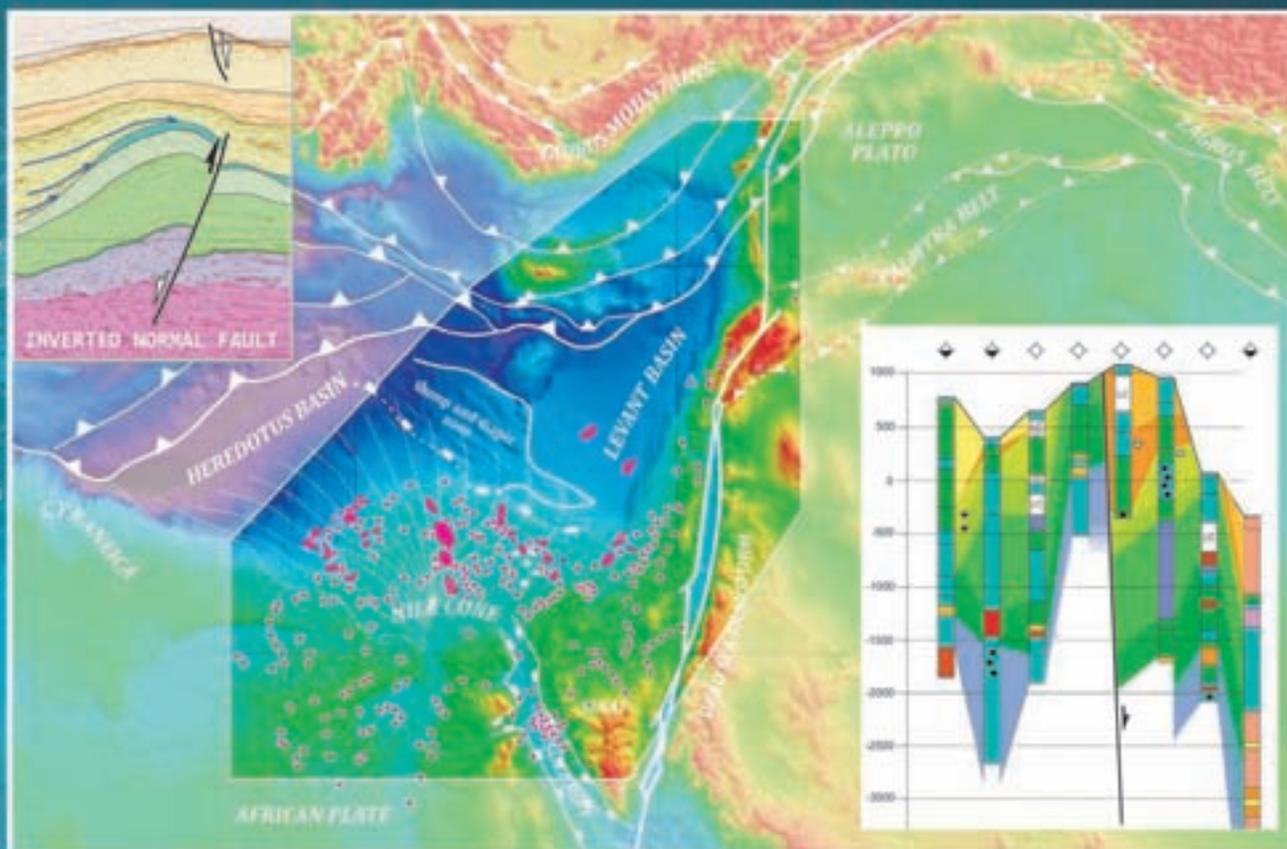
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Needed: Pipelines, policies**West's Shales Feel Price Squeeze**

By LOUISE S. DURHAM
EXPLORER Correspondent

If oil and gas players were asked to cast votes to select an industry mantra, "expect the unexpected" likely would be the unanimous winner.

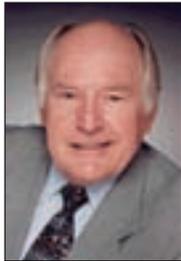
A year ago, commodity prices were soaring, and operators were scurrying to lock in long-term rig contracts.

The Rocky Mountain players were feeling especially good back then – weren't we all? – given that their stomping ground was the fastest growing region in the United States for gas production, according to Randy Ray, Denver-based consulting geologist/geophysicist and a recognized authority on the region.

Then, lo and behold, shale gas plays with humongous reserves potential began popping up in other parts of the country at a rate once unthinkable, posing considerable competition for investment dollars.

"Various plays in the Rockies are still very profitable and will continue to go ahead," said AAPG member Pete Stark, vice president for industry relations at IHS. "And there will be some where cost versus performance in the new market paradigm just aren't going to be competitive with shale gas."

"This sort of snuck up on everyone, almost like the doggone recession did," Stark said. "We got hit with the dramatic collapse in oil prices and the collapse of the



Stark

Suddenly we're in the hundreds of trillions of cubic feet of new gas potential.

economy, the banks – it was like a house of cards.

"On the cusp of the economic collapse, there was the realization that, my God, the industry had broken the code on producing gas from shales," Stark exclaimed.

"Suddenly, we weren't just in the tens of trillions of cubic feet of new gas production potential," he noted, "but were in the hundreds of trillions of cubic feet of new gas potential."

Even though natural gas prices have since tanked – at least for now – Stark pointed to the bright side, saying:

"The most exciting news in decades for U.S. energy security is the fact that the industry has broken the code and now can produce large volumes of natural gas from U.S. basins."

Rockies 'Saved the Day'

The initial big crack in the code for shale gas occurred in the Barnett Shale play in Texas in the late 1990s. The Barnett team at then-Mitchell Energy had struggled for 17 years before that eureka moment when they switched from gel fracturing to water, which performed much the same as gel while significantly lowering stimulation costs.



Production revved up dramatically once horizontal drilling commenced in the field.

Today, operators have added stage fracs to the horizontals where long laterals are partitioned into segments that are stimulated in rapid succession to increase reservoir contact.

"The old paradigm in horizontal wells was you pay about twice as much for the well and get three times the gas back," Stark said. "What the operators did is they took stage fracturing into the horizontal wells in the shales, starting with the Barnett and moving to the Fayetteville, the Woodward and, more recently the Marcellus and the Haynesville."

"They're paying now twice as much for a horizontal well and getting five or ten times more gas," Stark said. "The factor is five or ten times more daily production and five to ten more EUR per well."

"For the average tight sand well in the Rockies, they're getting about one MMcf/d, with perhaps one Bcf of reserves per well, and paying about \$1.5 million for that," Stark said. "A shale well might yield 5 MMcf/d for a cost of \$2.5 million."

But Stark was quick to give credit where credit is due.

"The Rockies absolutely saved the day

for U.S. gas over the last decade, along with the Barnett, when the Gulf Coast (mainly offshore) lost more than eight Bcf/d while the Rockies added 5.5 Bcf/d," he said.

Operators in the Rockies broke a code of their own about 10 years ago relative to producing gas from a variety of coal seams and tight sands, according to Stark.

"In breaking the code, essentially they were drilling vertical wells through several thousand feet of tight reservoir sands and developed the technique of stage fracs," he said.

"The first four or five years those plays all evolved, what we saw year over year is for the average well, productivity improved as they improved their fracturing and completion techniques."

Marcellus Bargains: A Rockies Challenge

Economics and well productivity vary for different plays even in the same region, and the Rockies are no exception. Stark predicted that some of the stronger plays will continue to be strong and that it will be selective.

Like most other hydrocarbon producing areas, there are myriad challenges.

"Natural gas is now less than \$5 an Mcf, and Rockies gas is at least \$1 less than that," Stark said. "But in the Marcellus (shale), they're actually getting more than Henry Hub price because of the favorable market location," he noted, "and the industry is going to be forced into a major

See **Rockies Gas**, page 24



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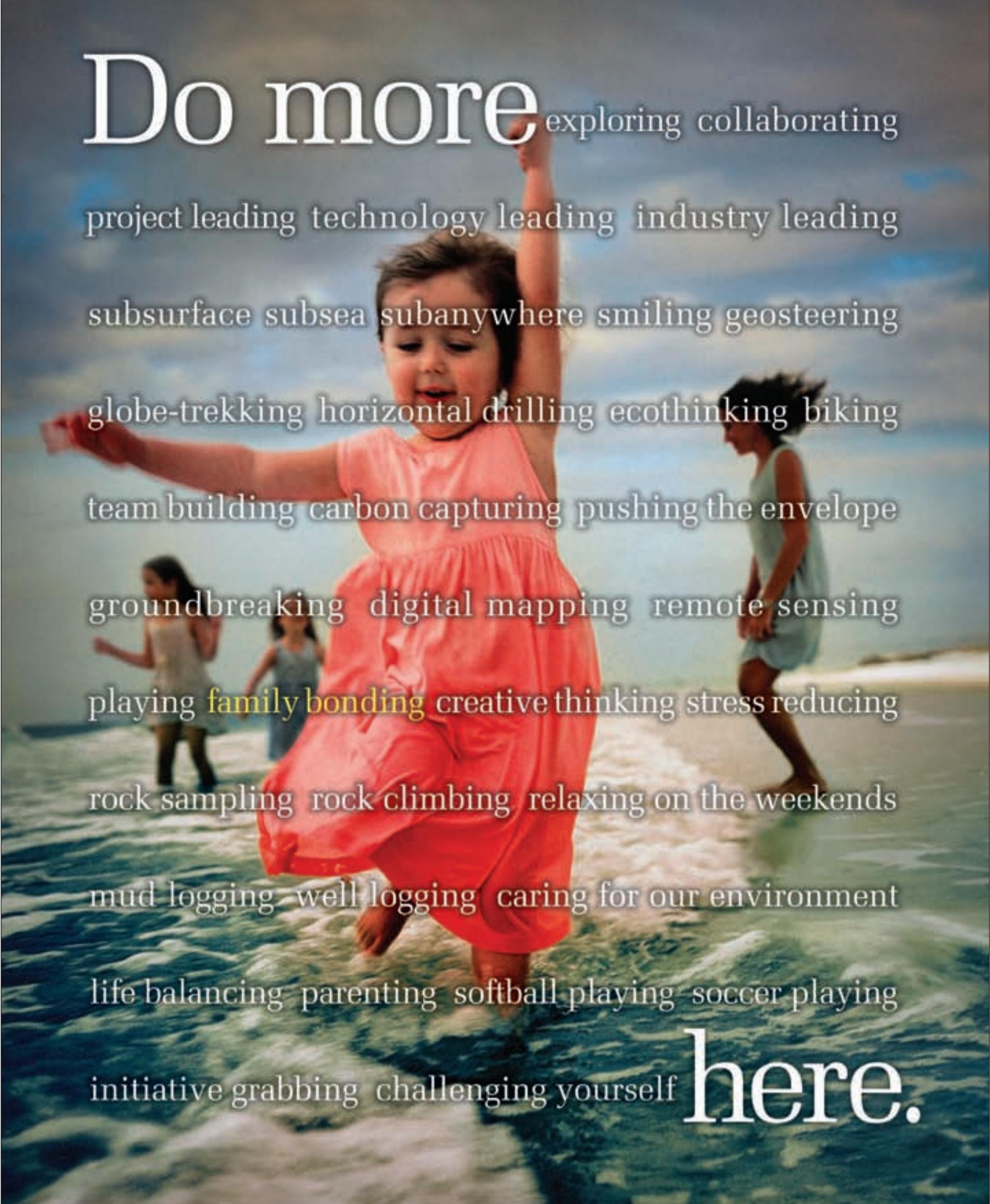


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Red Wing from page 20

with True Oil and another of the paper's co-authors, "is to develop a geological model to be used in reservoir studies ... to define reservoir properties."

"Until the 3-D survey," Weimer said, "the data set consisted of wireline logs, production information, some 2-D seismic profiles and a few cores."

'One of the Best'

Herber and Weimer first delivered the findings at the Denver 3-D symposium, a Rocky Mountain Association of Geologists/Denver Geophysical Society event held annually for 16 years.

The specific purpose of this presentation was to give a history of how the 3-D seismic data have been interpreted so far – and what may be on the horizon.

"Ben gave a real-time demo of the data set on the large screen discussing how different seismic attributes were used to arrive at the best structural interpretation," Weimer said.

This is important, according to Herber, because interpretation of a 3-D seismic data set using select attributes allows for the detailed mapping of the faults and deformed strata within the impact feature.



Weimer



Herber

the central core.

"Specifically, the outer rim has a radius of 3.3 to five kilometers, and is defined by a series of arcuate normal faults, which are, in essence, an updip slide escarpment."

Individual faults, he said, are up to 2.5 kilometers in length, with offsets up to 110 meters, and the inner rim has a

"A combination of coherency, curvature, edge stacking and dip azimuth attributes were used iteratively to determine the best interpretation," he said. "These attributes indicate that faults deform primarily the outer and inner rims, and

radius of two kilometers.

"Along the inner rim, faults have normal to high-angle reverse motion with offsets" up to 135 meters and up to 1.6 kilometers in length," he said. "Faulting density is greatest in the central core. Faults are up to 0.8 kilometers in length, and have a radial to crosscutting pattern within the core."

Herber and Weimer are quick to share the credit for the project and the presentation, specifically including co-authors Chunju Huang, Shu Jiang and Stan Hammon.

It is Barton, though, who has been in charge of the exploration, who may have best summed up the excitement surrounding this specific 3-D study:

"This new interpretation by Ben probably will be one of the best ways to figuring out Red Wing Creek Field." □

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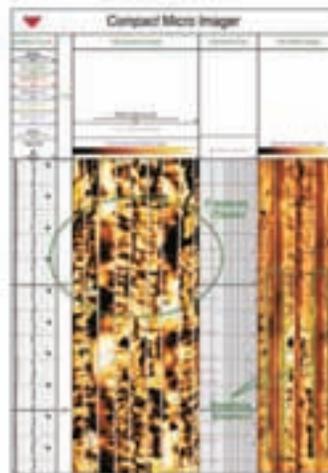


Image data obtained in a horizontal CIM (Coal Bed Methane) well with CIM on Well Shuttle.



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Rockies Gas from page 22

adjustment to these new economic realities."

During his keynote address at the Colorado Oil and Association's annual meeting last November, Questar president, chairman and CEO Keith Rattie announced that for the first time in the company's 80-year history they are allocating more capital this year for drilling outside the Rockies than within.

"That will likely be the case until we get better visibility on both pipeline take-away capacity and regulatory policy," Rattie said.

What's Needed

Meanwhile, it may be time to re-group and come up with a new approach to the technology mix in this part of the world.

"In an environment where it looks like Rockies gas is going to be less than \$5, cost cutting is one thing, but there's another component that's going to have to start, and that's to find another technology breakthrough," Stark said.

"We got one when we first did stage fracturing," he said. "We'll need another so it puts tight sands wells back kind of on par with what's happened in the shales."

"From the outlook of boosting the market after we get through this lousy recession, the Rockies gas is going to continue to be critical as a major supply source for the U.S.," Stark emphasized.

A caveat:

"Rockies production can't continue to grow until new export pipelines get built," Rattie said. "We need another major Rockies export pipeline by 2012."

"I'm convinced we need a 42-inch 'bullet' from Wyoming to Chicago," he said, "and the work needs to start now."

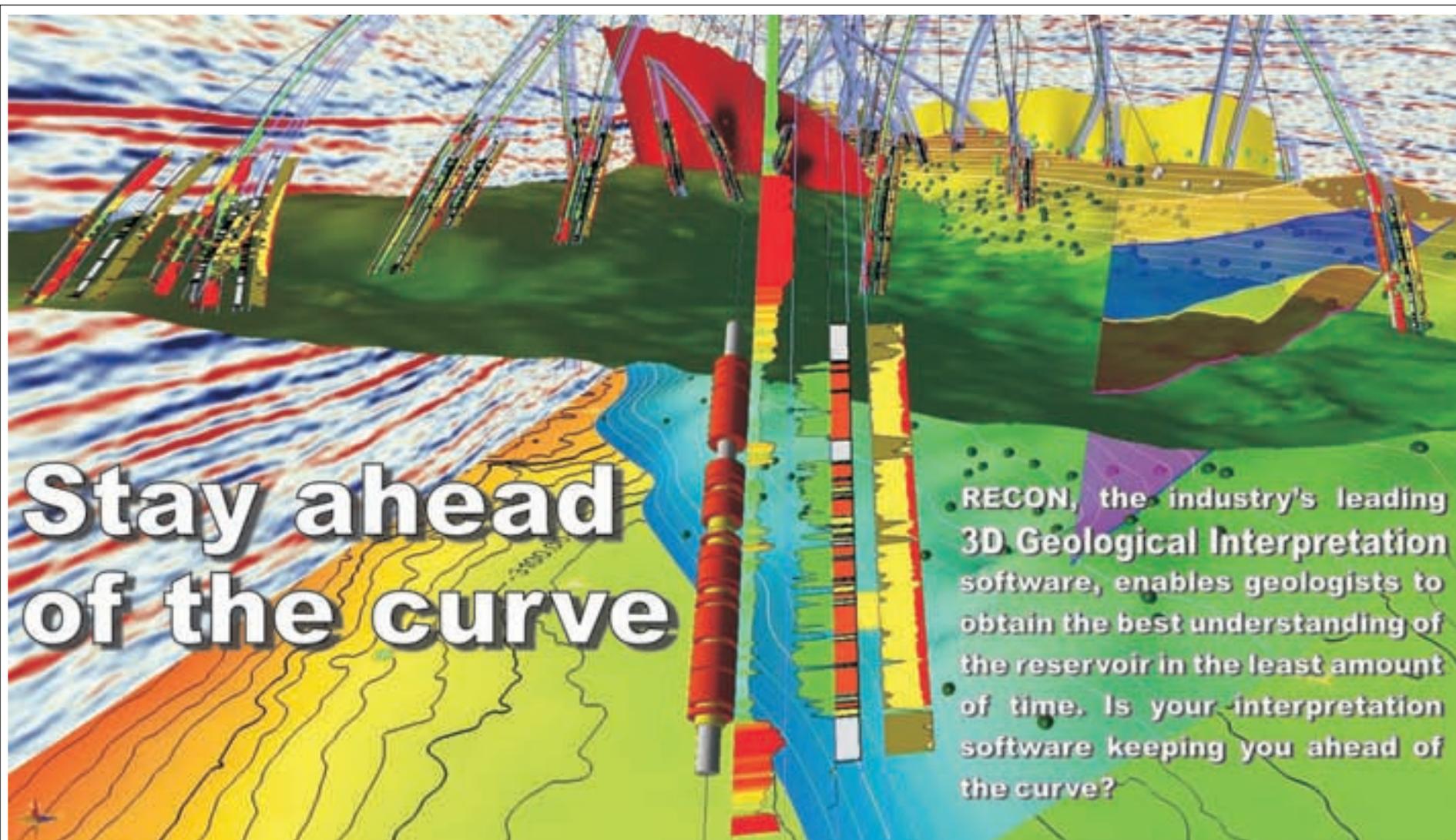
Stark noted the unexpected occurrence of the ability to produce giant volumes of gas from unexpected reservoirs uncovered and exploited by the industry has ushered in a whole new sea change age, and there's going to be massive adaptation to the new paradigm.

"From the point of energy security," he said, "it's fantastic this has happened for the U.S."

Some folks haven't gotten the message. "If you polled the members of Congress, most would tell you America is running out of natural gas," Rattie said. "A recent Navigant study puts the U.S. natural gas resource base at more than 2,200 Tcf – roughly 100 times current U.S. annual consumption."

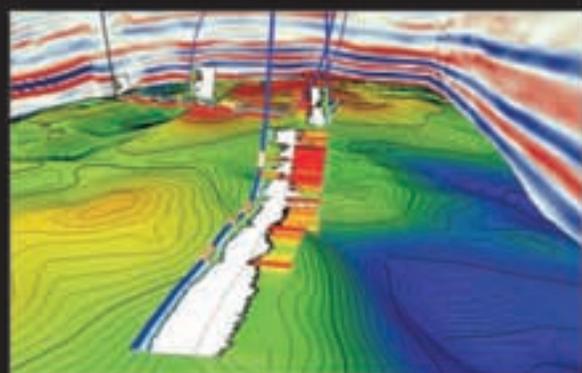
"That number is sure to grow," he added.

Rattie emphasized the need for producers to spread the word that natural gas is abundant and American, noting that more than 98 percent of the country's gas supply comes from North America, including the roughly 8 percent that originates in Canada. □



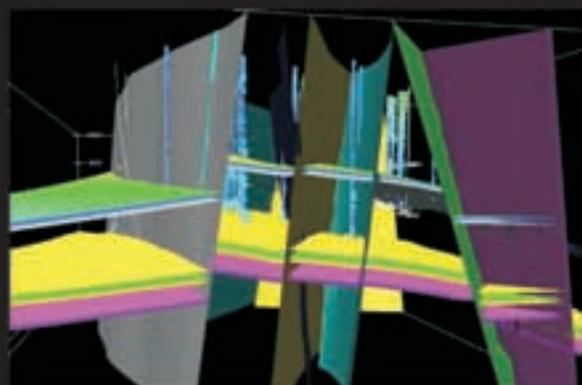
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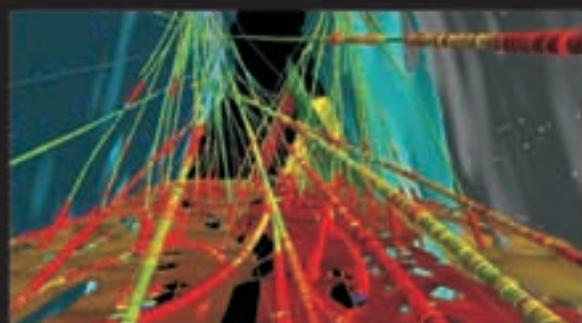
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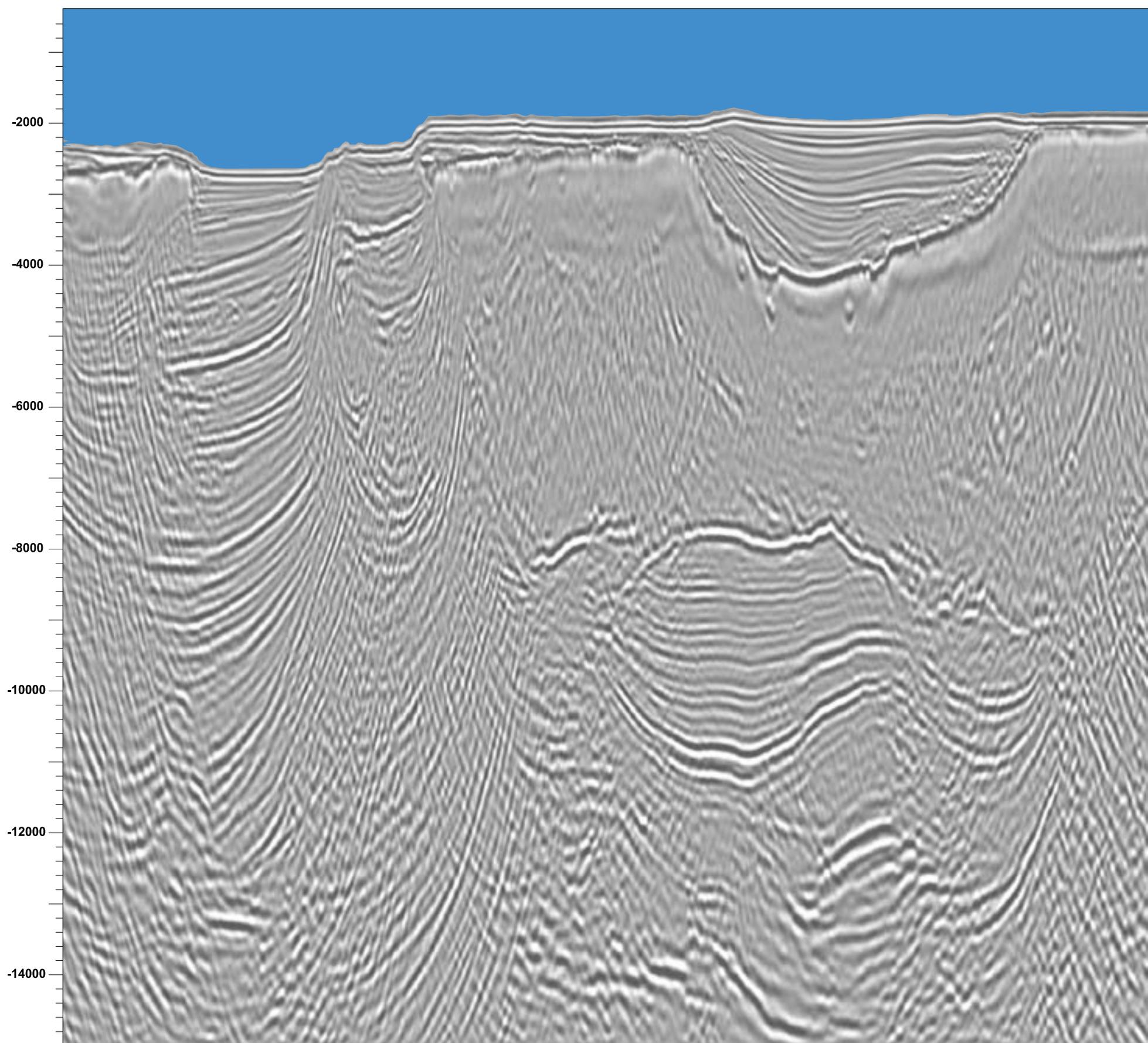
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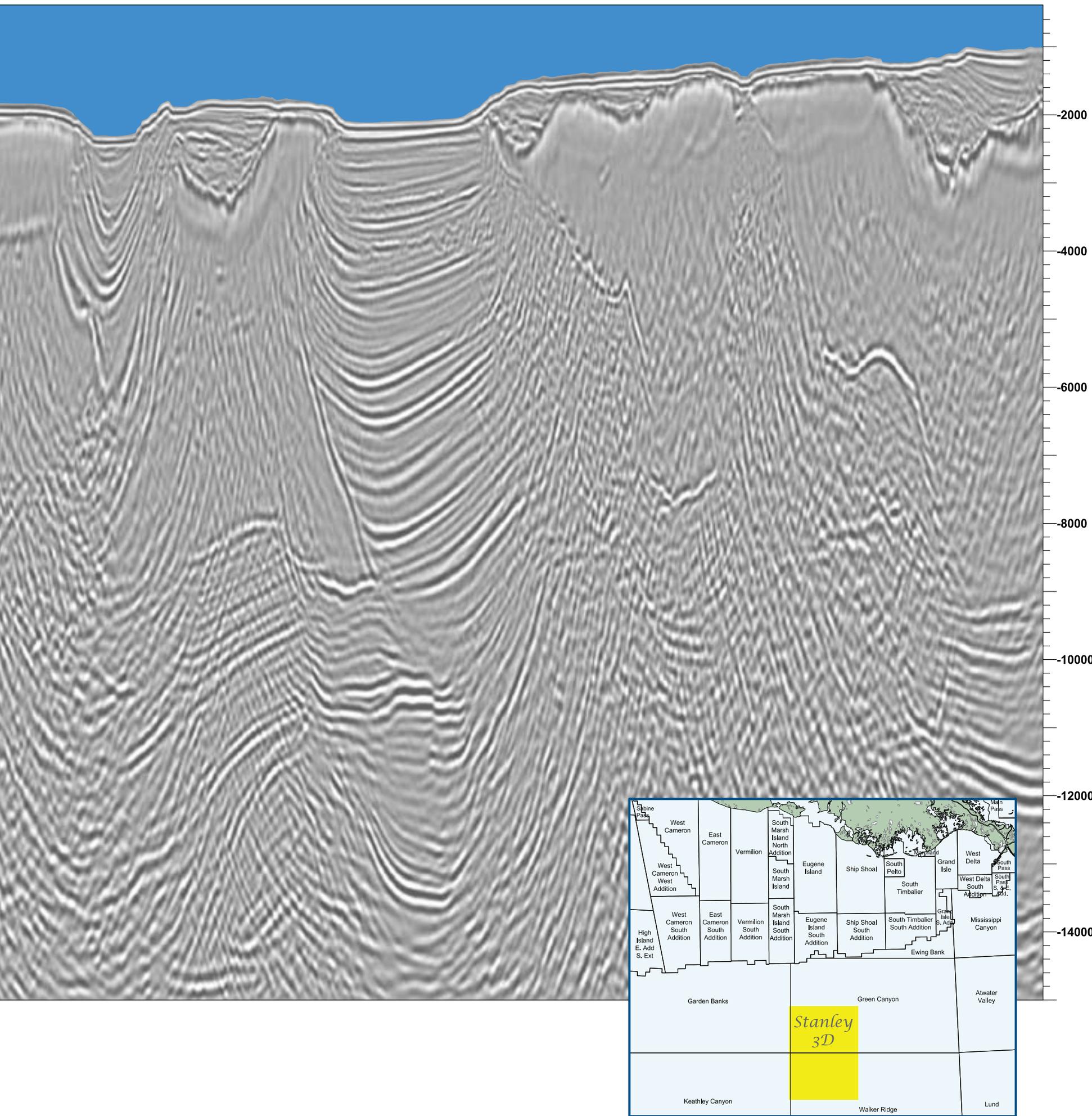


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Spraberry channel chasers aim carefully

More 'Silver Bullets' Helpful

By LOUISE S. DURHAM
EXPLORER Correspondent

When 3-D seismic evolved into the hot technology for E&P during the 1990s, it quickly gained a reputation as a kind of Holy Grail of the industry.

Prospect-generators trying to peddle a drilling prospect without 3-D were shunned for the most part.

Yet 3-D seismic frequently needs a bit of help, particularly when it comes to exploring for stratigraphic traps.

In these cases, traditional exploration techniques – including regional play concepts, subsurface well control, 2-D seismic and early 3-D seismic surveys – often yield marginal results.

The geoscientists at Midland-based Fasken Oil and Ranch recognized this fact early on in their effort to explore in the Permian-age Spraberry trend in Texas.

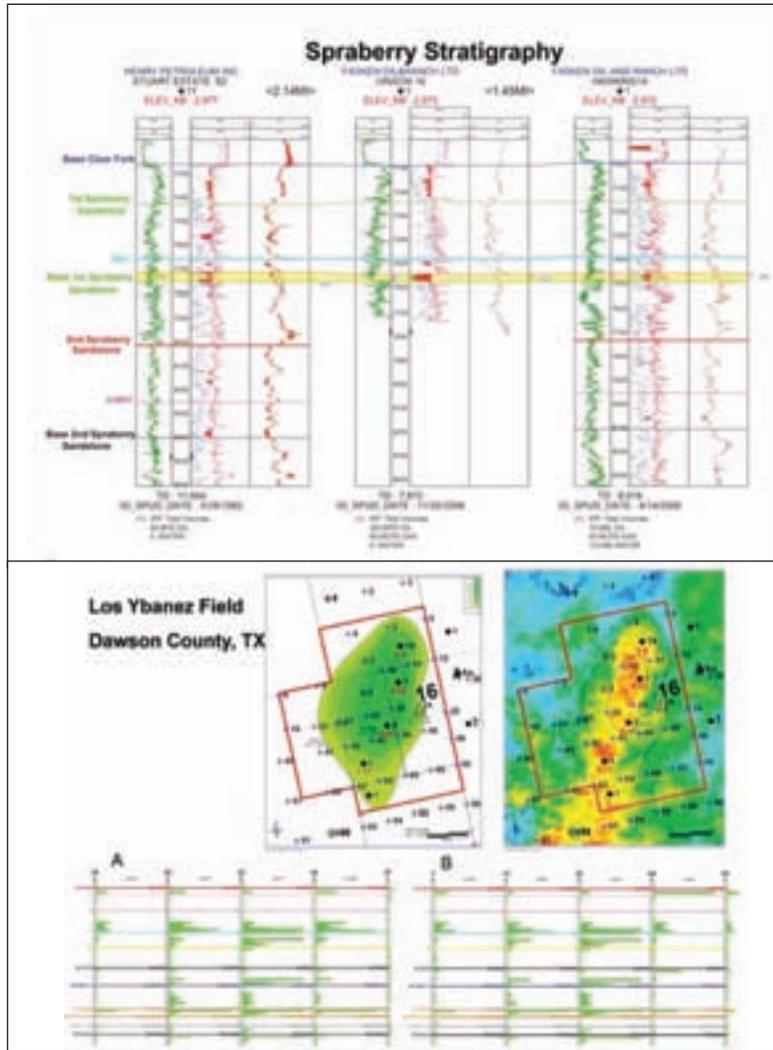
"The Spraberry trend of the Midland Basin poses significant challenges to extracting known reserves," said AAPG member Glenn Winters, chief geophysicist at Fasken. "Poor recovery factors are due to low permeable, mud-rich, distal fan deposits, basinward of the Horseshoe Atoll.

"Proximal fan deposits in the northern half of the Midland Basin often contain better reservoir properties," Winters said, "but are much more discontinuous and difficult to delineate."

3-D's Exploration Potential

Fasken's attention is focused on specific intervals in the trend.

"We're looking for conventional zones within the Spraberry, isolated sandstones that are



conventional pays in the unconventional Spraberry, which overall is a tight sand," said Fasken geologist and AAPG member Stonnie Pollock.

The company has several waterfloods producing from the Gin sand interval and other zones close to the Gin at roughly 7,700 feet deep. These fields were discovered by operators drilling to deeper targets as much as 11,000 feet, according to Pollock.

"Historically, it was hard for people to drill and then successfully offset and find a field," Pollock noted. "When they would try to complete an entire field they would drill a lot of dry holes."

An example is the Key West Field near La Mesa, Texas, where 30 wells were drilled in and around the field, and only 13 are producers.

"This is one of the first areas where 3-D seismic was used as an exploration tool," Winters said. "In the middle '90s, people shot a lot of 3-Ds out here looking for deeper targets."

"They really didn't utilize their 3-D seismic for Spraberry channels," he noted. "Part of the reason is the data quality probably wasn't good enough to delineate the fields."

"The premise we started off with was when you find it, it could be good, it's not that deep and land was relatively inexpensive here," Winters said.

Nice Recovery

In spring 2004 Fasken drilled an industry-generated prospect in Dawson County, where the Spraberry was initially discovered in 1948, according to Pollock; the prospect was developed from subsurface well control.

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Voting Opens for Division Candidates

Online voting will be available in early April to elect AAPG Division officers for the next term. Voting will continue through May 15, and new officers will begin their service July 1.

President-elect winners serve as Division presidents in 2010-11; vice presidents serve one-year terms, and secretaries, treasurers and councilors serve two-year terms.

The Division candidates are:

Division of Environmental Geosciences President-Elect

- ☐ Nancy J. (Anne) Fix, Pacific Northwest National Laboratory, Richland, Wash.
- ☐ Mary K. Harris, Savannah River National Laboratory, North Augusta, S.C.

Vice President

- ☐ Rob Maric, Schlumberger Water Services, Waterloo, Canada.
- ☐ Jeffrey G. Paine, the University of Texas at Austin.

Secretary

- ☐ Douglas A. Carlson, Louisiana Geological Survey, Denham Springs, La.
- ☐ Kevin S. Hopson, Daniel B. Stephens and Associates, Lubbock, Texas.

Division of Professional Affairs President-Elect

- ☐ Suzanne M. Cluff, The Discovery Group Inc., Denver.
- ☐ Daniel J. Tearpock, Subsurface Consultants and Associates, Houston.

Vice President

- ☐ James M. Hill, BNK Petroleum (US), Camarillo, Calif.
- ☐ Michael R. Canich Jr., Equitable Production Co., Pittsburgh.

Secretary

- ☐ Paul H. Pause, consultant, Midland, Texas.
- ☐ Terrance G. O'Hare, Emerald Energy, Dallas.

Energy Minerals Division President-Elect

- ☐ Michael D. Campbell, M.D. Campbell and Associates, Houston.
- ☐ Stephen Testa, consultant, Mokelumne Hill, Calif.

Vice President

- ☐ Fran Hein, Alberta Energy Research Conservation Board, Calgary, Canada.
- ☐ John (Jock) Nathan McCracken, Petro-Canada, Calgary, Canada.

Treasurer

- ☐ Dallas B. Dunlap, Bureau of Economic Geology, the University of Texas at Austin, Texas.
- ☐ Kent Bowker, Bowker Petroleum, The Woodlands, Texas.

Councilors

- ☐ (Gulf Coast Section) Michael A. Wiley, The Consulting Operation, Canyon Lake, Texas.
- ☐ (Southwest Section) J. Michael Party, Wagner and Brown Ltd., Midland, Texas. ☐

continued from previous page

The company had two early 1980s vintage seismic lines that were near the proposed well location, and a geophysical signature thought to be associated with the target reservoir was interpreted from those lines.

The initial well was a duster.

"After we drilled the dry hole, we said what can we do to better identify a field," Pollock noted, "and when we do, how can we better delineate it?"

To explore specifically for the Gin interval in Dawson County, the Fasken team first completed field studies over several producing fields containing many Spraberry reservoirs.

They reprocessed and mapped their widespread database of 2-D seismic and obtained and reprocessed old 3-D data sets. Several lead areas were identified, and a high-effort 3-D survey was acquired.

Ultimately, conventional 3-D seismic interpretation techniques were integrated with advanced technologies, including Gore-Surface Geochem Analysis and Geotrace's RockRes seismic processing techniques.

As a result of this all-out effort, two fields – Los Ybanez and Mati Rae – were discovered in 2006 adjacent to the Key West Field that Fasken used as an analog.

Seven of eight wells drilled were economic. Additionally, the exploration team predicted several dry or uneconomic wells that were drilled by competitors in the area, Winters noted.

To date, the two fields have produced over 600 Mbo and a Bcf of gas from nine wells. Current daily production tallies 440 bopd and 1 MMcf/d.

There's more action to come.

"We acquired a second 3-D seismic in early 2008," Winters said, "and several anomalies have been identified.

"Once again, Geotrace's RockRes and Bandwidth Extension processes were applied," he said, "and this past January Fasken completed a large geochem survey deploying several hundred modules.

Fasken plans to commence a multi-well drilling program in May.

Winters noted there is no one silver bullet, emphasizing that the use of three or four silver bullets will reduce risk.

"We're trying to advocate you can't just look at conventional seismic data," he said. "Using the old 2-D data, the old vintage 3-D seismic data, it will give you an area to focus on – but then we go to the next level and apply several of these technologies together." ☐



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Findings ring true globally

Canada Feels Demographic Crunch

By SUSAN R. EATON
EXPLORER Correspondent

Earth scientists, it seems, are more relevant than ever to the Canadian oil and gas industry.

"Human Resources Needs in Earth Sciences in Canada," a report issued recently by the Canadian Federation of Earth Sciences (CFES), has been dubbed Canada's "first-ever" multi-sector survey – spanning government agencies, academic institutions and the petroleum, mining, environmental and geotechnical industries.

The report voiced concerns about declining student enrollments juxtaposed against a graying population of geoscientists across the board (with the exception of the environmental industry, Canada's fastest growing employment sector).

Its findings suggest the impending demographic crunch and the projected shortage of highly qualified professionals could threaten the future viability of Canada's earth science sectors.

With a population of about 20,000 earth scientists, Canada has a history steeped in mining and oil and gas exploration – the very health of Canada's Gross Domestic Product hinges upon the sustainable harvesting of the country's natural resources.

The recent global economic turmoil, however – coupled with a 70 percent decline in world oil prices – has forced the oil and gas sector to slash capital expenditures and reduce workforces.

A scant six months ago, Calgary-based oil and gas companies were aggressively competing for both entry level and experienced earth scientists; today, layoffs in the oil and gas sector have translated into an uncertain future for geoscientists.

Outside the Box

The CFES survey provides both an historical overview of employment trends and lays out a road map to bridge the growing capacity gap, addressing human resource needs during the next five years.

Canadian oil and gas leaders say the report's findings are timely and relevant as the industry weathers the current economic storm, navigates uncertain waters and shifts its business model from exploring for conventional to unconventional resources in the Western Canadian Sedimentary Basin.

"No one has ever looked at purely earth sciences across the industrial sectors, at demographics and future trends," says AAPG member Ian Young, past president of the CFES and EnCana Corporation's vice president-business affairs Canadian Foothills. "To me, the results of the survey are even more urgent because we're experiencing a recession."

CFES data indicate that university enrollment at the B.Sc. entry level tracks the boom and bust cycles of commodity prices for metals and oil. Between 1986 and 1999 – tumultuous years for the global oil and gas industry – academic enrollment plummeted in undergraduate earth science programs. Canada's oil and gas industry simultaneously experienced waves of layoffs and dramatically reduced the recruitment of university graduates, resulting in today's bimodal distribution of



Young



Photo by Rob Fensome, Geological Survey of Canada

A vanishing breed? A recent survey suggests a looming shortage of Canadian geoscientists because of several factors. One appeal that the profession can claim is the opportunity to visit magnificent sites (above) like the late Carboniferous alluvial sequence at Joggins, Nova Scotia, Canada. Joggins is a UNESCO World Heritage site – and a great place for geologists to visit.

Human Resource Study Was Extensive

The CFES or FCST (the "Fédération canadienne des sciences de la Terre") is an umbrella organization comprising 12 technical and learned societies and interest groups, including the Canadian Society of Petroleum Geologists.

Striving to be the unified voice for earth sciences in Canada, the CFES engages the general public, producing outreach, education and career

materials on earth sciences for K-12 school children and university students.

Additionally, the organization advocates the use of sound scientific data to shape industry and government policies on resource extraction, the management of the natural environment and the mitigation of natural disasters.

During its human resources study, the CFES polled 20 percent of Canada's

earth scientists, or roughly 4,000 individuals representing more than 117 organizations. Additionally, the CFES survey integrated data from 8,600 geoscientists represented by the Canadian Council of Professional Geologists.

The CFES report can be viewed at http://www.geoscience.ca/CFES_HR_requirements_Canadian_earth_sciences.pdf.

new hires and baby boomers.

"When the demand side (for oil) picks up again, we're going to have a worse human resources problem," Young warned.

"People have described mining and oil and gas as the two solitudes," he said, pointing to Canada's traditional employers of earth scientists. "Hopefully, there's more work for geoscientists in geotechnical, environmental and mapping applications."

David Eaton, professor of geophysics and head of the Department of Geoscience at the University of Calgary, echoes Young's comments.

"We need to think outside the box," he said. "Geology and geophysics students receive unique, hands-on exposure to important real-world problems, preparing them for many careers paths – from law to education – in addition to traditional professional employment in the oil industry."

The University of Calgary's geoscience department has established four main areas of technical expertise: exploration geophysics, petroleum and energy-related geoscience, environmental geoscience and solid earth processes.

"The current generation of students

across Canada is environmentally savvy. We need to demonstrate to them the fundamental role of environmental geoscience," Eaton said, suggesting at the same time that the oil and gas sector needs to dispel some public misperceptions about its environmental track record.

According to the CFES report, the environmental sector's need for earth scientists is expected to grow by more than 30 percent during the next five years alone – this sector is attracting an ever-increasing percentage of Canada's young geoscientists.

The Graduates

With a compliment of 480 undergraduate and 170 graduate students, the University of Calgary is, by far, Canada's largest earth science degree-granting institution – in fact, according to Eaton, this department represents approximately 15 percent of Canada's entire undergraduate geoscience population.

At a time when most other Canadian universities are experiencing falling earth science enrollments, the University of Calgary – located at the epicenter of Canada's oil patch – is recruiting new faculty members in response to increased student numbers and generous industry funding, including EnCana's recent endowment of a chair in unconventional

gas research.

"The Canadian oil patch is unusual, globally, in that it prefers bachelor graduates for entry level hires and molds them into the corporate culture," Eaton explained. "It reflects a tradition here."

Eaton suggested, however, that the current economic downturn may produce a greater demand for M.Sc. graduates who possess broader levels of expertise.

"Exploration and production activities are getting more challenging," he said, citing:

✓ A growing focus on unconventional resources in Western Canada.

✓ A recently announced \$100 million mapping program of the Canadian Arctic by the Geological Survey of Canada.

✓ Advancements in carbon capture and geological sequestration.

"As we move forward from conventional to unconventional resources, there are different skills required," Young said about the changing face of oil and gas exploration in Canada.

"We're moving from 'romantic' pioneering exploration teams working in undeveloped basins to a new reality," he added, "where earth scientists are part of multi-disciplinary teams trying to extract the most from the rocks."

According to the CFES findings, education requirements vary by sector, with the environmental and mining sectors

continued on next page

continued from
previous page

employing a far larger percentage of master's graduates than the oil and gas sector. Not surprisingly, government and research agencies hire earth scientists with master's and doctorate degrees.

"I like the CFES report," says Dale Leckie, another AAPG member and chief geologist at Nexen Inc. "It's timely, appropriate and it agrees with the research I've been doing during the past couple of months."

As Nexen's chief geologist, Leckie's job includes the recruitment of new graduates and the establishment of formalized, in-house mentoring and training programs for new hires or those individuals with zero to five years of industry experience.

Leckie, also president of the Society for Sedimentary Geology (SEPM), points to a shortage of young trained specialists in the oil and gas industry, a group that the CFES describes as the HQPs.

"If we discourage the new graduates, we will be facing the same shortage when the industry picks up again," he said. "And it's not just layoffs – it's also the lack of hiring."

Leckie indicated that Nexen was honoring job offers to this year's crop of university graduates, while continuing to invest in the training of its new hires.

"The CSPG saw this demographic crunch coming in the mid-1980s," says AAPG member Graeme Bloy, president of the CSPG and vice president of exploration for Canada Capital Energy Corp.

According to Bloy, the CSPG has a bimodal membership distribution skewed toward the "baby boomers."

The CSPG's health, he says, depends upon young geologists entering the field.

In response, the CSPG has allocated a "significant" budget for education and outreach, targeting both university and K-12 students.

"At least 50 percent of earth science graduates don't even make it into their chosen field," he said.

Bloy was surprised that the CFES report did not address gender issues, indicating that more than 50 percent of



Leckie



Bloy

Canada's Earth science students are female.

"In the oil and gas industry we've seen such a large increase in women working in the geosciences," said Bloy, a 30-plus-year industry veteran.

"The industry has not historically had a long-term view of manpower management," he continued. "We have some challenging times ahead in terms of keeping the younger people in the business."

"This crash," he warned, "will severely impact succession planning in companies." □

To read more about this subject, visit the AAPG Web site.



Photo courtesy of Elisabeth Kesters, CFES

Dalhousie University students analyzing tidal sediments in Minas Basin, Nova Scotia.



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'To Do' List

While there was no "one-size-fits-all" solution – each sector faces its unique challenges – the CFES provided the following action plan:

- ✓ Raise general public awareness of the role of earth sciences in society.
- ✓ Canada's future challenges include energy, water, material needs and short- and long-term natural hazards.
- ✓ Influence education curricula at the provincial level and increase its efforts to recruit students into earth science curricula.
- ✓ Increase Canada's annual output of B.Sc. graduates in earth sciences.
- ✓ Push to increase employment opportunities for immigrant professionals in the earth science sectors.
- ✓ Provide mentors and experienced scientific leadership to younger staff.
- ✓ Advocate for increased research funding for all sectors of earth science disciplines.

– SUSAN R. EATON

GEOPHYSICALcorner

Bit by Bit: A Good Seismic Strategy

(The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month's column is the second of a two-part series on drill-bit seismic technology.)

By BOB HARDAGE

Last month we looked at the concept of utilizing the axial impacts of the rotating teeth of a rotary-cone drill bit as a downhole seismic source, which allows seismic data to be acquired by surface-positioned sensors as a well is being drilled.

Poly-diamond crystalline (PDC) bits are now replacing rotary-cone bits in many drilling programs. PDC bits cut rock by a scraping action – not by an axial chiseling action, as does a rotary-cone bit.

And because of its rock-cutting style, a PDC bit does not generate a seismic wavefield that is adequate for seismic imaging or for other seismic applications, unlike the robust wavefield produced by a rotary-cone bit.



Hardage

* * *

Technologies are now available that acquire seismic-while-drilling (SWD) data by embedding seismic sensors in the drill string near the drill bit (figure 1). With this technology, vertical seismic profile (VSP) data can be acquired while drilling with any kind of bit, including PDC bits, by using these downhole sensors together with a surface-based seismic source.

At each depth where seismic information needs to be obtained, drilling action must cease for several minutes so that the downhole sensors are in a quiet environment as they record the seismic wavefield produced by the source. The responses of the drill-string sensors are stored in a downhole memory unit included in the drill-string system.

The data are retrieved when bit trips are made and the seismic-sensor section is returned to the drill floor.

This downhole seismic sensor technology allows numerous seismic applications to be implemented as a well is being drilled, with examples being:

- ✓ Predicting overpressure intervals ahead of the bit.
- ✓ Imaging below and laterally away from the well bore.
- ✓ Defining the relationship between drilling depth and seismic image time in difficult velocity areas in real drilling time.
- ✓ Guiding the bit to a target identified on a surface-based seismic image.
- ✓ Positioning core barrels at

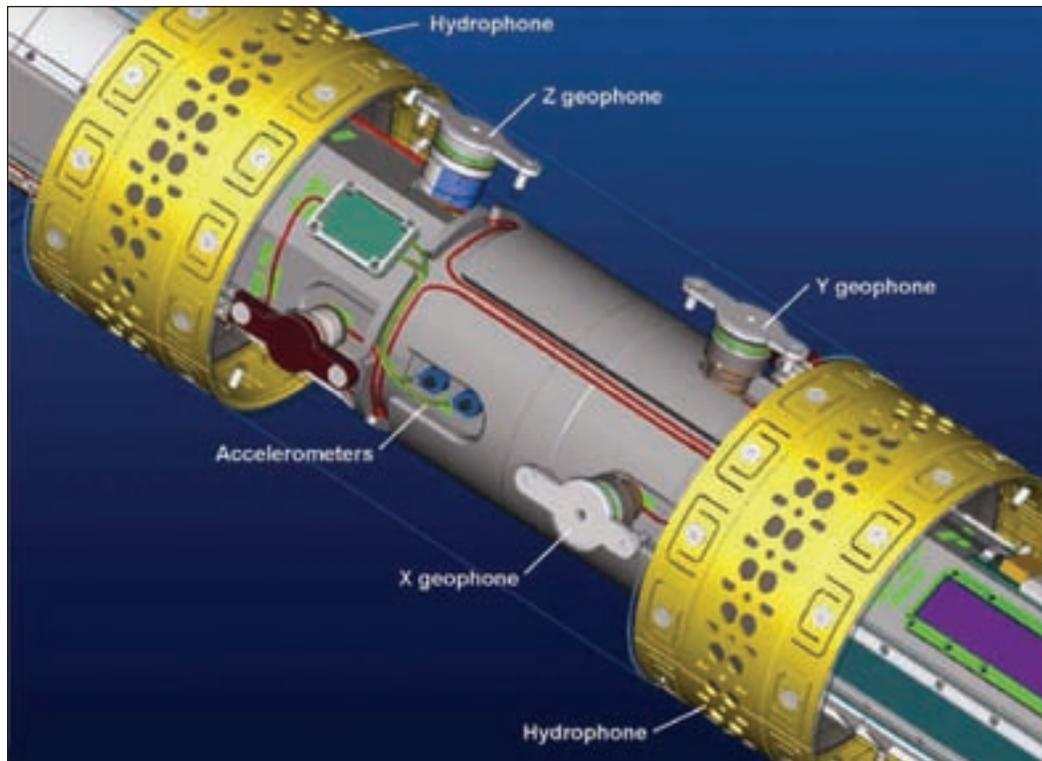


Figure 1 – One drill-string seismic sensor package used to acquire seismic data while drilling. This module is positioned in the bottom-hole assembly near the drill bit.

Illustration, data courtesy of Schlumberger

the onset of a seismic reflection interval of interest.

Numerous other applications are possible, and several encouraging proof-of-concept tests have been done.

* * *

An example of the data quality that can be achieved with drill-string seismic sensors is illustrated on figure 2. Conventional VSP data acquired in the same well with wireline-deployed sensors also are shown to aid in evaluating the quality of the SWD data.

VSP data almost always are recorded at regularly spaced depth intervals, as they are in this data display. However, as in this example, SWD data may be recorded at irregularly spaced stations positioned at depth coordinates where well conditions allow drilling to be stopped so a quiet seismic condition can be produced in the borehole.

The reflections noted in these particular SWD data are of sufficient quality for the data to be used in seismic imaging applications.

An example of an image produced from drill-string seismic sensors is displayed as figure 3.

These data were acquired as a deviated well was drilled toward the targeted interval marked by the robust seismic reflection events on the seismic profile. The intent was to ensure that the well penetrated the objective at a structurally high position where there was optimal time thickness of the target interval.

These data are an example of SWD data being used to guide a drill bit to a seismic-defined point of penetration on a target.

* * *

Acquiring seismic data while drilling is good strategy in areas where:

- ✓ Precise time-vs.-depth relationships are not known.
- ✓ There is concern about drilling into an over-pressured interval.
- ✓ Where a core needs to be collected starting at the top of a seismic-defined stratigraphic interval.

Contact your well services provider to find out how to implement SWD technology when you are confronted with drilling in any of these challenging situations – plus numerous other applications that have not been illustrated in this short review. □

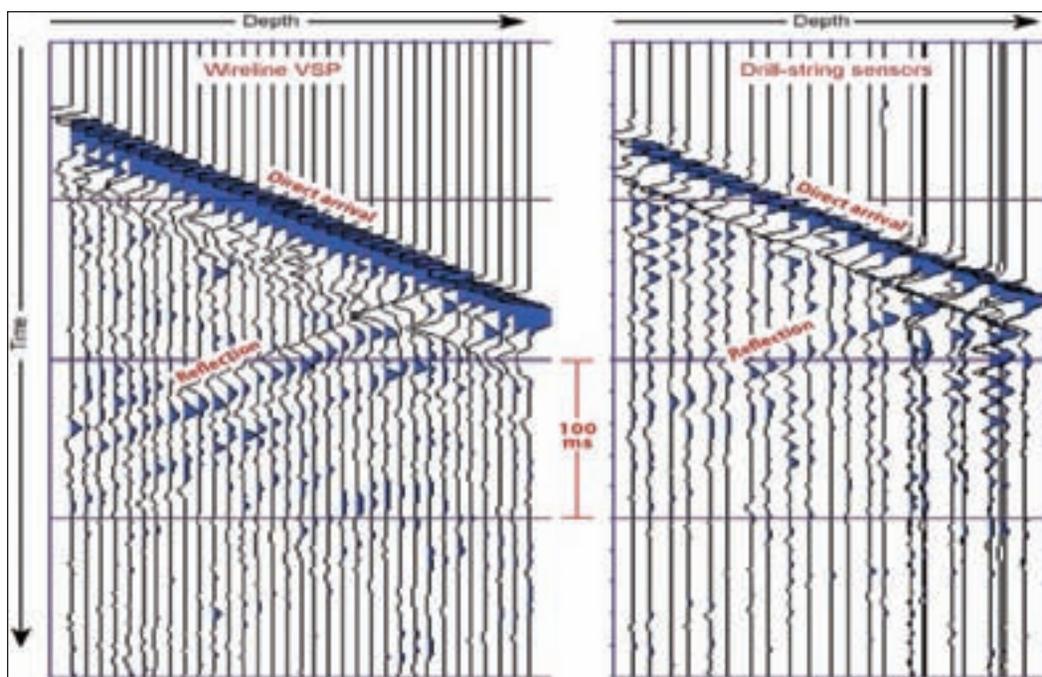


Figure 2 – Comparison between seismic data acquired with drill-string sensors (right) and with conventional wireline-deployed sensors in the same well (left).

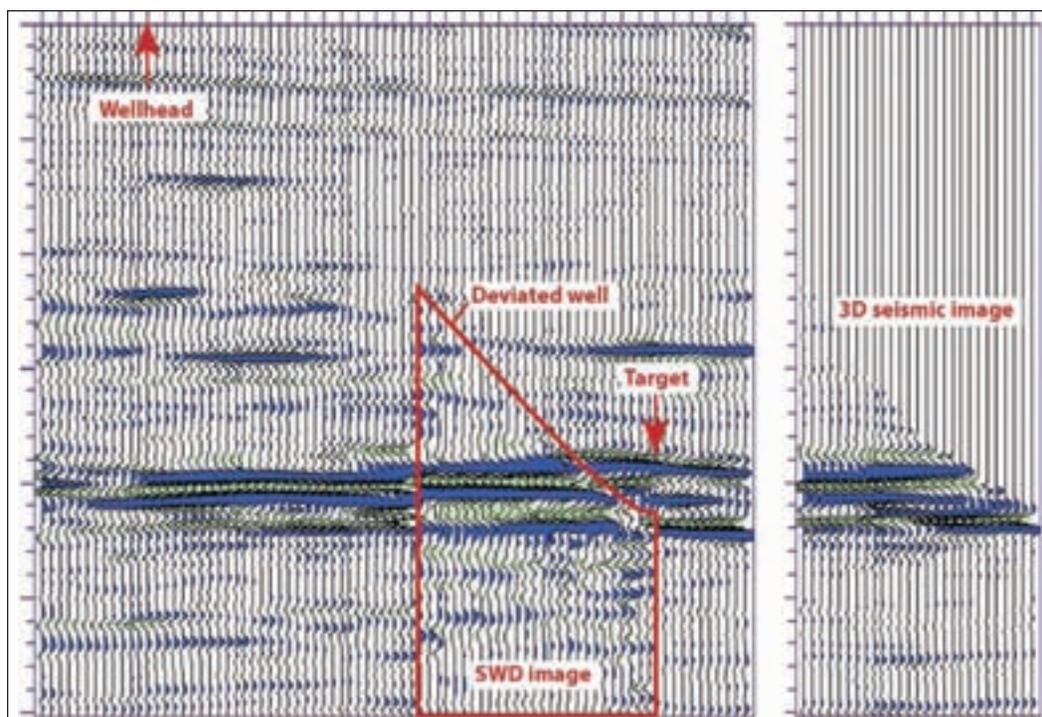


Figure 3 – Imaging with drill-string sensor data acquired in a deviated well. The image made with SWD data is spliced into a surface-based 3-D seismic image on the left. The surface-based image that has been replaced by the SWD data is shown on the right for comparison.



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Instructor: Paul Weimer, University of Colorado, Boulder, CO



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July 28-30 / Houston, TX

Instructor: Hugh W. Reid, Hugh W. Reid & Associates, Calgary, AB, Canada



Folds, Faults and Hydrocarbons in the Southern Canadian Cordillera – Principles and Practices

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Instructor: Peter B. Jones, International Tectonic Consultants, Ltd., Calgary, AB, Canada



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July 18-24 / Begins and ends in Calgary, AB, Canada

Leaders: John H. Shaw, Harvard University, Cambridge, MA, & Dr. Frank Bilotti, Chevron, Houston, TX



Fractures, Folds, and Faults in Thrusted Terrains: Sawtooth Range, Montana

August 17-21 / Begins and ends in Great Falls, MT

Leaders: William B. Hansen, Jireh Consulting Services, Great Falls, MT; Steve Boyer, Consultant, Tacoma, WA; Chuck Kluth, Kluth & Associates, Littleton, CO; Jim Sears, University of Montana, Missoula, MT



More Science Than You Can Shake A Pick At.



American Association of Petroleum Geologists

WASHINGTONwatch

A Whopping Sum of Money

By DAVID CURTISS
GEO-DC Director

April 15 is the day of financial reckoning for most U.S. taxpayers. That is the day when many of us rush to the post office at the stroke of midnight to send our tax forms to the IRS, typically accompanied by a check for taxes owed (those getting a refund have reason to file much earlier).

On the way, I run through a mental check list of the many programs and services my tax dollars support. I also consider the many programs and services not supported by tax dollars, but rather debt-financing that must be repaid at a future date.

New York Times columnist David Brooks commented in a satirical piece Dec. 11, 2008, that "(in Washington, D.C.) zeros have lost their meanings. The amount of consideration once devoted to a proposal costing \$3 billion is now devoted to a proposal costing \$300 billion. Americans have entered the age of budgetary infinity."

That statement contains more than a kernel of truth.

Since the beginning of 2009, President Barack Obama and the 111th Congress have been working on three spending bills:

- ✓ The American Recovery and Reinvestment Act of 2009, better known as the "stimulus bill" (\$790 billion).
- ✓ Fiscal year 2009 appropriations (approximately \$3.2 trillion).
- ✓ Fiscal year 2010 budget (\$3.6 trillion).



Curtiss

The stimulus bill makes a large down payment on Obama's promise to significantly change the nation's energy sector.

These are whopping sums of money. Depending on political or economic persuasion, you may feel strongly that the money spent is prudent and necessary or frivolous and reckless. There is evidence to support both positions. But the spending choices do reveal much about the president's energy priorities.

The stimulus bill, signed into law on Feb. 17, makes a large down payment on Obama's promise to significantly change the nation's energy sector. In order to have a "stimulating" effect on the economy, most of these funds must be spent over the next 24 months.

The types of programs funded in the stimulus range from building efficiency improvements (creating construction jobs) to the development and building of advanced battery technologies to transform the automotive industry – and the purchase of these vehicles for government fleets.

It also includes funds to retrain workers to succeed in the field of energy efficiency and renewable energy. The

power sector sees significant investment with \$4.5 billion dedicated to upgrade the nation's energy grid.

Science receives high priority with \$1.6 billion going to that general category, and an additional \$400 million designated to launch the Advanced Research Projects Agency – Energy to foster a public-private partnership in achieving energy technology breakthroughs.

A total of \$3.4 billion is dedicated to fossil energy R&D, mostly focused on carbon capture and storage.

At the close of the 110th Congress only three of 12 appropriations bills had been signed into law. So Congress passed two continuing resolutions that funded the government through early March at fiscal year 2008 levels. On March 10 they passed a final omnibus bill to fund the government for the remainder of FY2009.

More than half-way through the fiscal

year, it was just a matter of getting it done.

The bill includes \$20 million for natural gas technologies and \$5 million for petroleum-oil technologies at the U.S. Department of Energy, as in FY2008.

Similarly, the geological resources programs at the U.S. Geological Survey received funding at FY2008 levels.

* * *

President Obama unveiled his budget for fiscal year 2010 on Feb. 26. Having been in office just over one month, this first budget release outlined high-level numbers and did not include agency specifics. More specific numbers will be released this month.

The new budget fully aligns with energy priorities outlined in the stimulus bill and the president's statements.

For the DOE it calls for a total budget of \$26.3 billion, up from \$24.1 billion in 2008. The priorities funded include:

- ✓ Increases in basic science funding.
- ✓ Loan programs to stimulate the deployment of green energy projects.
- ✓ Development of low-carbon coal technologies, specifically carbon capture and sequestration.
- ✓ Upgrades to the nation's electrical grid.
- ✓ Investments in energy efficiency, biofuels and renewable energy.

Again, we do not know how this

See [Washington](#), page 36



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Area at top of exploration lists**GTW to Focus on Western Desert**

Egypt's diverse and potentially prolific Western Desert province will provide the context and the content of AAPG's inaugural international Geosciences Technology Workshop (GTW).

"The Mesozoic Western Desert, Egypt" GTW will be held April 28-29 in Cairo.

This workshop, held in association with the Egyptian Petroleum Exploration Society, will examine the geology, petroleum systems, geophysics and drilling of the Western Desert to better understand what makes the system work – and how to best explore and develop its resources.

Dave Blanchard, vice president and general manager for El Paso Egypt, and Mostafa El Bahr, vice CEO of exploration and agreements for Egyptian General Petroleum Co., are co-chairs.

The Western Desert province holds one of the richest stores of natural resources in Egypt and is at the top of many lists of international exploration targets (see February EXPLORER). This GTW is designed to deliver up-to-date technical content, field case studies and papers that address the question, "How are we doing it now?"

The GTW structure includes four technical sessions to provide in-depth analysis of key elements in successful Western Desert exploration and development:

✓ **Petroleum Systems.**

The Western Desert has experienced a complex history of multi-phase deformation, both extensional and compressional, during which hydrocarbon source rocks were deposited in both the Jurassic and Cretaceous. This session will

explore the regional manifestations of these various structural events, the interplay between structuration and hydrocarbon maturation, the relative roles of long-range versus vertical migration and regional geochemical and geothermal variations/similarities between various Western Desert basins.

✓ **Basin Analysis.**

Rifting occurred in the Western Desert in the Middle Jurassic, Early and Late Cretaceous and Early Cenozoic. The resulting syn-rift sediments were either in communication with, or proximal to, the opening Neotethyan seaway. Lateral and vertical facies changes in the Western

Desert are therefore complex and in certain areas – and at some geologic times, strongly influenced by eustatic sea-level fluctuations.

This session will focus on the Western Desert's tectonostratigraphic architecture – and how this has influenced recent major discoveries.

✓ **Geophysics.**

The Western Desert's exploration resurgence is directly correlative to the widespread application of 3-D seismic technology. This session will illustrate recent advances in the use of seismic technology to identify both deeper and more subtle trapping styles – and

anticipated future developments.

✓ **Drilling and Completion Technology.**

The Western Desert's drilling environment remains technically challenging – some formations and basins remain particularly difficult to drill. This session deals with those challenges, including the importance of modern bit technology and well-stimulations to decrease drilling costs and increase producibility and ultimate recovery.

For more information contact Abeer Al Zubaidi, AAPG's Middle East and India director, at azubaidi@aapg.org, or go online at www.aapg.org. □

Washington from page 34

budget will affect the technology programs in oil and natural gas, which have suffered in years past but are a vital source of scientific advances and new technology. These R&D programs also provide essential research support for the geology and geophysics programs at the nation's colleges and universities to educate and train the next generation work force.

Even more worrisome to many AAPG members is that, in order to generate revenue to offset many new expenditures, the budget includes a rollback of tax benefits currently

available to oil and gas companies. These rollbacks are valued at \$31.5 billion over 10 years.

It also repeals the \$50 million annually dedicated from offshore mineral receipts to fund ultra-deepwater and unconventional oil and gas research. And it proposes a fee on non-producing leases.

Most of these changes will require Congressional approval, and this typically means they will be altered prior to passage. However, many of these provisions already have passed either the House or Senate during the last Congress, but did not have presidential support. That variable has now changed.

* * *

Our guideposts as we communicate

with Congress and the administration are the Association's statements, developed by the DPA Government Affairs Committee, reviewed by the DPA and approved by the Association's Executive Committee. These statements discuss the importance of access to public lands, prudent tax policy, need for research and development and building the next generation work force, among others.

As our nation's leaders chart a course toward an energy future that includes dramatic increases in renewable and alternative fuels and reduced reliance on fossil fuels, they must not lose sight of the necessary policies and investment in fossil energy, which remains the foundation of our energy supply today – and, absent a major technology breakthrough, will continue for decades to come. □



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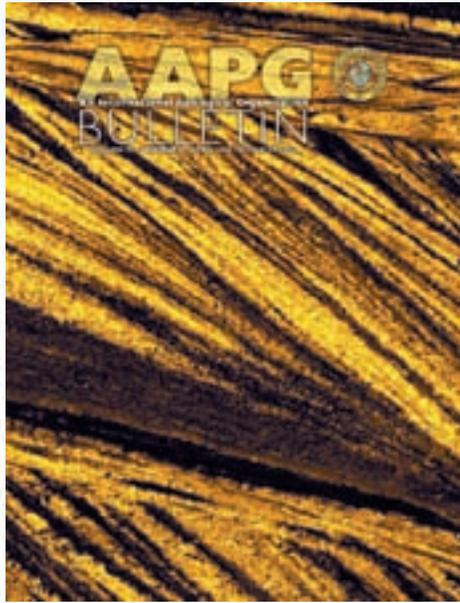
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The April 2009 cover of the AAPG Bulletin

More science than you can shake a pick at.

Deformation along oblique and lateral ramps in listric normal faults: Insights from experimental models

Shamik Bose and Shankar Mitra

Results of clay experiments to model secondary faults formed along lateral and oblique ramps, commonly associated with listric growth faults in the Gulf of Mexico and Niger Delta, provide insight into fault formation and configuration with implications for the understanding of fluid flow in passive margin settings.

New tools for seismic stratigraphic interpretation: Stratal convergence and instantaneous isochron attribute cubes derived from volumetric flattening of experimental strata

Jesse Lomask, Jason M. Francis, James Rickett, Marc L. Buursink, Thomas P. Gerber, Martin Perlmutter, and Chris Paola

Two novel seismic attributes derived from volumetric flattening of experimental strata facilitate better seismic interpretation. Stratal convergence and instantaneous isochron attribute cubes, allow identification of erosional or nondepositional surfaces and estimation of sedimentation rate, respectively.

Fractures in sandstone reservoirs with ultra-low permeability: A case study of the Upper Triassic Yanchang Formation in the Ordos Basin, China

Zeng Lianbo and Li Xiang-Yang

Fracture distribution within the Yanchang Formation in the Ordos Basin, China, provides information regarding permeability enhancement in ultra-low permeable sandstone reservoirs. Knowledge of the paths exhibiting the best connectivity, largest apertures, and highest permeability can be used to optimize well placement.

Insights into the mechanisms of fault-related folding provided by volumetric structural restorations using spatially varying mechanical constraints

Chris A. Guzowski, Joachim P. Mueller, John H. Shaw, Pierre Muron, Donald A. Medwedeff, Frank Bilotti, and Carlos Rivero

A new, mechanically based volumetric structural restoration tool is applied to 3-D seismic images of detachment and shear fault-bend folds. These techniques provide full 3-D restorations that closely match established 2-D kinematic theories, yet allow for constraint of 3-D displacement fields and strain patterns in complex structures.

Sequence stratigraphy of experimental strata under known conditions of differential subsidence and variable base level

John Martin, Chris Paola, Vitor Abreu, Jack Neal, and Ben Sheets

In a controlled setting, experimental strata were deposited and evaluated in a sequence stratigraphic context against the known boundary conditions and depositional history. Four key stratigraphic discontinuities were identified, and the stacking arrangement of the preserved, bounded strata is a good time-averaged representation of the mass balance history.

Stratigraphic controls on a salt-withdrawal minibasin, north-central Green Canyon, Gulf of Mexico: Implications for misinterpreting sea level change

Andrew S. Madof, Nicholas Christie-Blick, and Mark H. Anders

Sedimentation within the Fuji Basin, a salt-controlled intraslope minibasin in Green Canyon, Gulf of Mexico, is likely primarily controlled by halokinetic autocyclicity. Passive salt motion best accounts for sediment transport, calling into question the importance of eustasy in controlling off-shelf lowstand sedimentation at scales of less than 10 km.



Members may access the AAPG Bulletin online at http://www.aapg.org/April_Bulletin/

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

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

FOUNDATIONupdate

'Town Halls' Spotlight Activities

By REBECCA GRIFFIN
AAPG Foundation Manager

Coming soon, perhaps to a city near you ... the AAPG Foundation, up close and personal.

The Foundation recently initiated a series of Trustee Associate luncheons and joint AAPG/Foundation "Town Hall" meetings, built largely around the Foundation's "Challenges – Assuring Success" campaign.

The new initiative was unveiled for Dallas/Ft. Worth-area Trustee Associates and guests at the Fort Worth Petroleum Club, an event hosted by Trustee Associate Jerry Namy. The luncheon

featured a review of the Foundation programs and new developments by Rick Fritz, the AAPG Association's Foundation and executive director.

That was quickly followed by a second forum and reception in Denver, where more than 250 Denver-area AAPG members and guests joined Fritz and AAPG President Scott Tinker for a review of Foundation and Association activities.

The Denver stop also included a luncheon for area Trustee Associates and guests, hosted by Foundation Trustee Bill Barrett and Trustee Associates Steve Sonnenberg and Ray Thomasson. Chairman Bill Fisher and Fritz were

featured speakers.

In addition to answering members' questions, providing information about Foundation programs and offering a "state of the Association" look at AAPG, the first town halls also included an unexpected bonus: AAPG members Lee Muncy of Ft. Worth and Michael S. Johnson of Denver, guests at the recent luncheons, enthusiastically joined the Trustee Associates, bringing the group's membership to 267.

Preparations currently are being made for similar luncheons and/or town hall meetings in New Orleans, Lafayette, La., Houston and Roswell, N.M.



Johnson

* * *

In addition to joining the Trustee Associates, Michael Johnson, who will receive the Outstanding Explorer Award at the upcoming AAPG Annual Convention and Exhibition in Denver, has provided funding to

AAPG's popular Digital Products Fund-University Subscription Program to provide a subscription for his alma mater, Ohio State University.

A Digital Products University Subscription provides students and faculty at the designated university access to the entire AAPG digital collection.

The University Subscription program, initiated in early 2005, now has funding for 50 designated universities.

For more information on how you can provide a subscription to your alma mater contact the Foundation office.

* * *

In other Foundation news, the Board of Trustees recently approved:

✓ \$5,000 in funding for students and faculty travel expenses to the Hedberg Conference on "Variations in Fluvial-Deltaic and Coastal Reservoirs Deposited in Tropical Environments," set April 29-May 2 in Jakarta.

✓ \$12,500 to the Professional Women in Earth Sciences Committee for sponsorship of the 2010 Women's Global Leadership Conference.

As a reminder, all AAPG members are encouraged to support the Foundation programs and join the "Assuring Success" campaign.

To learn more about the Foundation visit the Web site at <http://foundation.aapg.org>, where you'll find downloadable PDF files of the investment policy, annual report and grant proposal guidelines.

For more information, contact Foundation manager Rebecca Griffin at (918) 560-2644; or development coordinator Alison Robbins at (918) 560-2674. □

Foundation (General)

Chevron Humankind
AAPG volunteer grant for Richard Ball, Jessica Poteet, Joy Roth and Rhonda Welch

Robert Irving Levorsen
Harold Lee Muncy
Kay L. Pitts
Hiro Yoshino

Daniel A. Busch Library Fund

John R. Bailey

Grants-in-Aid Fund

EOG Resources
William Otis Williams
In memory of Rizer Everett

K-12 Education Fund

Chevron Humankind
Matching gift from Robert L. Scamman
M.A. Custer
Gerald Edmund Harrington
Hiro Yoshino

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Eugene F. Reid Dibblee Fund

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E.F. Reid Scouting Fund

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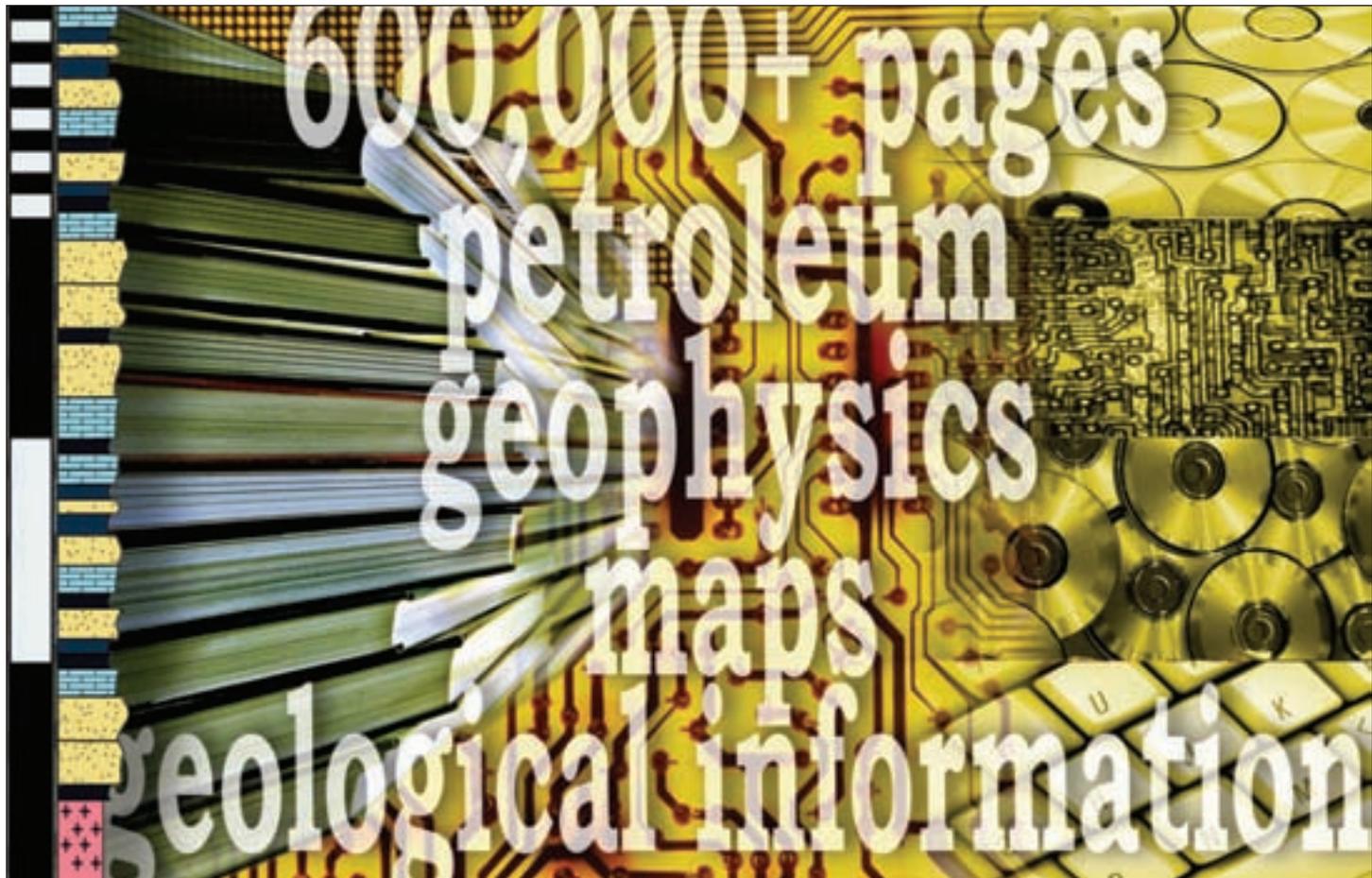
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Meeting Challenges
ASSURING SUCCESS



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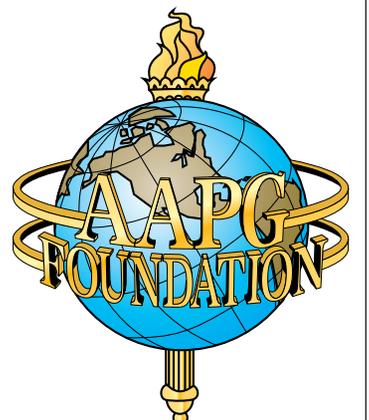
AAPG/Datapages is dedicated to compiling our exploration heritage with access to over 600,000 pages of petroleum, geophysics, maps and geological information of AAPG's Digital Library.

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To include your university, contact Rebecca Griffin, rgriffin@aapg.org or 918-560-2644.



Al-Naimi stresses broad cooperation

New Triggers Intensify Volatility

By LOUISE S. DURHAM
EXPLORER Correspondent

Stability and survival.

In a world of volatility and new challenges, those two words capture today's message for the industry, a perspective delivered recently in Houston by Ali Ibrahim al-Naimi, Saudi Arabia's minister of petroleum and mineral resources and former OPEC president.

Al-Naimi made the comments – and others – during a talk at the Cambridge Energy Research Associates' annual CERA Week event, a gathering that attracted a prestigious assemblage of heavy hitters from around the world.

Al-Naimi drew a packed house for his dinner presentation that focused on the need to achieve energy market stability during today's uncertain environment.

"A year ago, we were riding the crest of a wave of rising commodity prices, asset values and wealth creation that appeared unstoppable," al-Naimi said.

"Today, as we ponder the horrific consequences and the terrible swiftness and scope of the collapse, we know now that what we saw then was not unstoppable but rather unsustainable.

"These dramatic swings of fortune were clearly reflected in the price of oil," he said, "and I think we can all agree that



Al-Naimi

Whereas the recent past was all about high risk and high returns, the present focus is on stability and survival.

the volatility of oil prices over the past year was detrimental to the interests of producers, consumers and the like.

"We (all) share a common interest in energy market stability because it is critical to our economic success," al-Naimi emphasized.

"Whereas the recent past was all about high risk and high returns, the present focus is on stability and survival."

Market stability is enhanced via four conditions, he noted:

- ✓ Oil prices sufficiently low to facilitate economic growth, especially in low income developing countries.
- ✓ Prices high enough to provide a level of return to producers to ensure adequate and timely investment.
- ✓ Prices at a sufficiently high level to provide incentive for consumers to use oil in an efficient manner.
- ✓ Prices at levels that encourage production from marginal fields, non-conventional sources and renewables.

New Challenges

Geopolitics, weather and natural

disasters are known triggers for oil price volatility. Yet "newly emerging challenges" also contributed to last year's wild price swings.

Three of these challenges, he said, deserve special attention:

✓ First, globalization has served to internationalize capital markets, rendering national borders irrelevant as huge sums of money move unimpeded worldwide seeking the best returns. Each day, trillions of dollars are moved into and out of markets globally with just a mouse click.

Complexity of the financial transactions has increased along with the speed, making it extremely difficult for any one player – or even a group of players – to influence the markets and promote stability.

✓ Another emerging challenge contributing to volatility is the striking increase in the financial community's interest in oil and energy as an asset class. Investors' strategies have become highly sophisticated – oil even became a

popular mechanism to hedge the value of the dollar.

Al-Naimi stated that the extraordinarily high prices during last summer were in large part a reflection of the strength of the prevailing bullish market psychology of investors. He anticipates continued volatility with the exaggerated weakness in price, declaring prices will be just as unsustainable at the current low levels as they were at the unprecedented high levels experienced last year.

This could be the harbinger of a significant problem down the road, as ongoing volatility will impede adequate and timely investment in the energy sector.

"It is a condition that is detrimental to decision making and investment planning by producers and consumers alike," al-Naimi said. "If today's low prices continue long enough, they will sow the seeds for future price spikes and volatility."

✓ Al-Naimi said climate change will have a profound impact on redefining the role of governments and government intervention in energy markets.

"Perhaps more than any other issue we face, addressing climate change in an economically sound manner demands that we work cooperatively to find solutions," he said. "It is clear that the policies of one country to reduce emissions will have little impact if its actions are not taken in concert with the

continued on next page



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Push Begins for Denver Registration

Online registration as well as the complete technical program for the upcoming AAPG Annual Convention and Exhibition in Denver are now available online.

This year's meeting will be held June 7-10 in Denver at the Colorado Convention Center – and the sooner you sign up for the meeting, the more money you can save on registration fees.

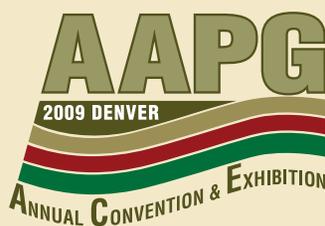
This year's program features more than 1,000 technical presentations, 18 field trips and 22 short courses.

Highlights include:

✓ Five forums: The History of Petroleum Geology; Challenges for

Global Energy Demand – Short-Term Variability and Long-Term Solutions; Discovery Thinking; Global Climate Change (Anticipating a Carbon Constrained Future – Implications for the Fossil Fuel Industry); and an AAPG Divisions Energy Forum.

✓ The All-Convention Luncheon, featuring the presentation of this year's AAPG Teacher of the Year award to Utah high school science teacher Ty Robinson and a talk by/conversation with T. Boone Pickens.



✓ Guilherme de Oliveira Estrella, the director of exploration and production for Petrobras, will give this year's Michel T. Halbouty Lecture, shedding some light on the significant sub-salt discoveries his company has experienced over the past two decades.

✓ This year's opening session will feature, in addition to Scott Tinker's presidential address and the presentation of AAPG honors and awards, entertainment by the Rocky

Mountain Children's Choir.

✓ This year's exhibits hall, in addition to offering the newest looks at the industry's hottest technology, will once again be the setting for the International Pavilion and this year's "Explore the Floor" contest.

As in past years the registration fees will be structured on a "tier" basis, and earlier registrants can save several hundreds of dollars by taking early action.

In fact, those who register by April 13 can save up to \$200.

Registration and meeting details can be found at www.aapg.org/denver. □

continued from previous page

rest of the world.

"Likewise, energy stability must be addressed globally and with broad cooperation," al-Naimi noted.

He acknowledged the world will likely transition away from the current fuel-based energy economy, emphasizing that no one yet knows which fuels or technologies will emerge. Nor is it possible to predict how long the transition will require.

A successful energy strategy will include efforts to increase the contribution of alternative fuels, but caution is imperative given that scale is critical in the massive global energy system.

"The existing oil delivery system is highly efficient and economical, and the cost of rapidly replacing it with alternatives would be prohibitive," al-Naimi said. "A prudent approach demands that we recognize that the massive scale of the global energy system makes rapid change costly and impractical."

Walking on Sunshine

While acknowledging the need to push forward with development of alternatives, al-Naimi emphasized it's important to be mindful that efforts to rapidly promote alternatives could have a chilling effect on oil sector investment.

"Growing demand uncertainty increases producers' perceptions of investment," he said. "A nightmare scenario would be created if alternative energy supplies fail to meet overly optimistic expectations, while traditional energy suppliers scale back investment due to expectations of declining demand for their products.

"The prospects of supply constraints would grow along with the potential for higher energy prices and lower economic growth," al-Naimi noted.

Regarding the need to develop alternatives, it may come as a surprise to many folks that Saudi Arabia already is at work on this initiative.

Think sun, for instance.

The Kingdom is not only awash with petroleum resources, it has copious quantities of sunshine that it intends to harness productively.

"We are investing substantial research funds to achieve our goal of one day becoming the world's largest exporter of clean energy in the form of electricity produced from our most abundant resource," al-Naimi said, "sunlight." □

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PROFESSIONAL news briefs

James Blankenship, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Texas, Arlington, Texas.

Michael Bone, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Memphis, Memphis, Tenn.

Brian Boslaugh, to exploration manager-Indonesia, Premier Oil, Jakarta, Indonesia. Previously vice president-exploration and production, Singapore Petroleum Co., Singapore.

Mark S. Caldwell, to geologist, NFR Energy, Denver. Previously senior geologist, Klabzuba Oil & Gas, Denver.

Joe Chandler, to associate geologist,

Chesapeake Energy, Oklahoma City. Previously student, Texas A&M University, College Station, Texas.

Philip Chapman, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Prudue University, Alabama.

Nathan Davis, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Texas A&M University, College Station, Texas.

Nancy Micklich Doelger, to consultant, N.M. Doelger Consulting, Casper, Wyo. Previously retired as coal leasing NEPA specialist and coal geologist, Bureau of Land Management, Casper, Wyo.

John Dolson has retired after 29 years

with BP and is now director, DSP Geosciences and Associates, Coconut Grove, Fla.

Donald Dorn-Lopez, to technical director, Max Petroleum, Almaty, Kazakhstan. Previously exploration manager, Max Petroleum, Almaty, Kazakhstan.

Adel Fawazy Douban, to chief geologist, Ras Al Khaimah Gas, Ras Al Khaimah, UAE. Previously lead geologist, EniRepSa Gas, Al Khobar, Saudi Arabia.

Shannon Dulin, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Oklahoma, Norman, Okla.

Jim L. Evans, to geology manager,

Ward Petroleum, Fort Collins, Colo. Previously senior geologist, Ward Petroleum, Enid, Okla.

Phil Fox, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Akron, Akron, Ohio.

Belinda Franko, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Akron, Akron, Ohio.

Alan W. Hart, to general manager, Optima Petroleum Consultants, Kuwait. Previously managing director, Golden Downs Consulting, Wakefield, New Zealand.

James Hayes, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Eastern Illinois University, Charleston, Ill.

Tracy Hulsey, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Texas Tech University, Lubbock, Texas.

Kasey Hundt, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Memphis, Memphis, Tenn.

Renee L. Klinger, to coalbed methane and oil and gas geological consultant, Klinger Geological Consulting, Trout Creek, Mont. Previously coalbed methane and geochemical consultant to CDX Gas, Trout Creek, Mont.

Tako Koning received the Alumni Honor Award from the University of Alberta, Canada, for his volunteer and humanitarian work during the past 16 years while living and working in Nigeria and Angola. Koning is adviser for Tullow Oil and residential representative for Yme Foundation.

David J.W. Mitchell, to president and CEO, Madison PetroGas, Calgary, Canada. Previously vice president international exploration, Nexen Inc., Calgary, Canada.

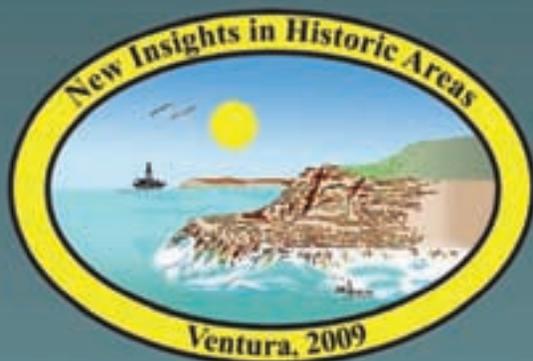
Jordan K. Revielle, to geologist, Ward Petroleum, Fort Collins, Colo. Previously student, Colorado School of Mines, Golden, Colo.

Stefano Santoni, to exploration manager, Bayfield Energy, Guilford, England. Previously exploration manager, Burren Energy, London, England.

Wolfgang Schlager has been awarded the Van Waterschoot van der Gracht Medal, the highest honor of the Royal Geological and Mining Society of Netherlands. Schlager is emeritus professor marine geology and sedimentology at the Free University in Amsterdam, Netherlands.

Laura L. Wray, to senior staff geoscientist, Williams Production RMT, Denver. Previously consulting petroleum geologist, Williams Production RMT, Denver.

(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.) □



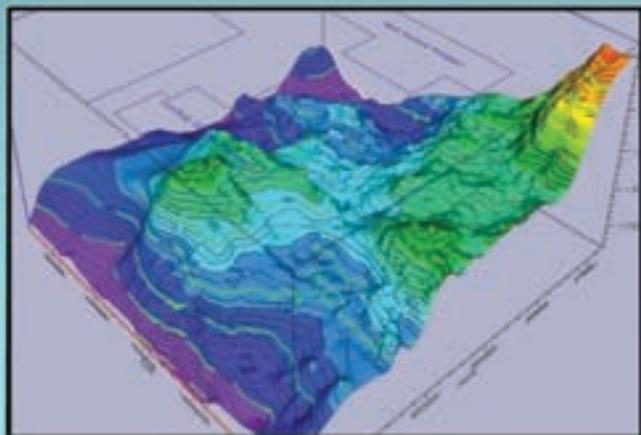
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SPOTLIGHT on...

Education Was the Fuel For CU President's Path

By CHRISTOPHER STONE
EXPLORER Correspondent

Go West, Young Man

The typical career path for AAPG members leads directly to the petroleum industry – but occasionally, members veer in other directions. Bruce Benson did both.

Benson started Benson Mineral Group in 1965 and guided the successful oil and gas company for more than 40 years. The veer came in early 2008, when he was named the 22nd president of the University of Colorado system.



Benson

That system includes three campuses at four locations, 54,000 students, 25,000 employees, a \$2.4 billion annual budget and a national reputation in both the sciences and the humanities.

While the switch from oil and gas company president to university president may seem dramatic, it really wasn't that much of a stretch for Benson. He has long had a passion for education, particularly higher education, and has been involved at varying levels of the enterprise for more than 30 years.

"I haven't entirely left the oil and gas industry, although it's been taking less and less of my time in recent years," Benson said. "However, I do stay current with what's happening.

"I have been involved in higher education in various ways for the past 24 years," he continued, "from chairing the statewide oversight commission to serving on task forces to chairing the Metro State College Board of Trustees, so the move was not as much of a change as people would expect."

In 1986, then-Colorado Gov. Richard Lamm appointed Benson to the Colorado Commission on Higher Education, where for three years he chaired the oversight board for the state's 28 public colleges and universities. Two subsequent Colorado governors appointed him to education panels. He also chaired the Board of Trustees of Metro State College of Denver from 2002-07.

"The transition to the university was relatively easy, given my long-time involvement with higher education," Benson said. "While I stay current with the oil and gas industry and remain involved in small ways, the demands of the university presidency occupy me seven days a week."

The physical and emotional transitions went smoothly. CU's downtown Denver offices are three blocks away from Benson Mineral Group's headquarters. And his roll-up-your-sleeves and tackle issues head-on approach works as well in higher education as it did in the oil and gas industry.

His passion for education runs parallel to his passion for geology. After starting his education at Cornell University in the late 1950s, he headed west to the University of Colorado at Boulder, where he earned his geology degree in 1964.

While pursuing his master's at CU, he also was pursuing oil in Kansas. He borrowed money, took out mineral leases and began drilling wells by himself.

When he returned to CU to meet with his adviser, Bruce Curtis, the professor asked about his progress. Benson told him he had drilled 11 wells and 10 were producers – but he was still working on his thesis.

Curtis offered the best advice an adviser could give – keep drilling wells and finish the master's later.

Today, Benson retains a fondness for CU's geology program and an interest in its progress. He sometimes attends departmental events and also finds time to visit with students. But the scope of his vision is considerably wider.

"Our geology department does a great job and is in capable hands," he said. "My focus is on our 54,000 students and our \$2.4 billion annual budget. My goal is to raise the profile of the entire university."

After listening to Bruce Curtis' advice, he grew Benson Mineral Group into one of the West's most successful oil and gas companies while expanding into real estate, banking and restaurants, among other ventures.

But Benson is more than a businessman. He got involved in myriad civic and philanthropic endeavors, making his mark on the Denver Zoo, the Boy Scouts of America, the Denver Public Schools Foundation and the National Parks Foundation, among a host of others.

Politics is another passion; he was the Republican gubernatorial nominee for Colorado in 1994 and chaired the state Republican Party twice, from 1987-93 and 2002-03.

Benson's most indelible mark may be the one he has made, and continues to make, on his alma mater. He and his wife, Marcy, ("My partner in all I do," he says) co-chaired CU's successful \$1 billion Comprehensive Fundraising Campaign from 1997-2003. He led the fundraising effort for a new geology building, the Benson Earth Sciences Building, and has donated more than \$9 million to CU.

CU granted him an honorary doctorate of humane letters degree in 2004. His philanthropic efforts toward renovating CU's old geology building led to another naming opportunity. And in a nice recognition of sound advice, CU-Boulder is now home to the Bruce Curtis Building. □

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Weger Added to Matson Award List

A co-author of this year's George C. Matson Award-winning paper was inadvertently left off the previously announced list of winners.

AAPG member Ralf Weger, with the University of Miami (Florida), was a co-author on a paper that was named the best oral presentation at last year's AAPG Annual Convention in San Antonio.

Mark Knackstedt will accept the Matson Award during this year's convention in Denver, for the paper "Carbonate Petrophysical Parameters Derived from 3-D Images." Knackstedt is with the Australian National University, Canberra, Australia.

Knackstedt's other co-authors are Mahyar Madadi, Christoph Arns, Gregor Baechle and Gregor Eberli. □

REGIONS&sections

IRC Promotes AAPG Involvement

(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 PETER KAHN
and PETER LLOYD

Probably you are aware that AAPG's International Regions Committee (IRC) helps promote AAPG as an international organization.

You may *not* be aware, however, that its role has evolved in the last few years, from being a facilitator between AAPG headquarters and the international regions to helping better represent and serve the professional needs of international AAPG members across the organization.

It does this, for example, by providing counsel to the Executive Committee and leadership on ways to:

- ✓ Enhance international membership.
- ✓ Increase services and benefits to international members.
- ✓ Review and recommend international education initiatives and conferences.
- ✓ Identify and recommend international candidates for AAPG honors, awards and committee positions.

This is largely possible because the Region presidents and the vice president-Regions all sit on the IRC, which is chaired by Peter Lloyd and Marty Hewitt (both members of AAPG's House of Delegates).

Through semi-annual meetings, monthly teleconferences and its Web site, the IRC



Kahn



Lloyd

also provides a forum for interaction between international members, their Regions and the U.S. Sections.

Increased Committee Representation

Last year the IRC embarked on a major project to systematically assure that international members were represented on committees throughout all of the AAPG structure. This initiative received great support from the Executive Committee and leadership in general, and implementation is now successfully completed.

In early 2008 there were 64 Region members among key committees. As a result of the IRC's push to increase that number for the 2008-11 term, eight new Region members were nominated by the Region leadership and appointed by President Scott Tinker – an increase in Region representation on key AAPG committees of 12.5 percent.

IRC Web Site Updates

As the IRC has evolved, its Web site and the Web sites for each Region also

have needed updating. Now the IRC Web site should be viewed more than anything as another communications tool that is circularly linked to the Regions' sites.

For example, the IRC site provides links to contact information for AAPG headquarters, the IRC Committee and Region elected leaders. Other links lead to a calendar of meetings and annual meeting reports, as well as helpful links to Hedberg conferences, Distinguished Lecturer programs and the International Pavilion.

Also, links to the local affiliated geologic societies in each Region are embedded, which allows local meetings and conferences to be linked globally.

Thus the Web site circularly linked to the Regions sites acts as an online bulletin board.

Whether you are preparing to attend AAPG's Annual Convention and Exhibition in Denver this June, or the International Conference and Exhibition in Rio de Janeiro in November, or perhaps one of several regional conferences this calendar year, check out the IRC home page and the Web pages for each of the Regions. There you can "meet" and contact each Region's officers via their photos and e-mail addresses.

E-Newsletters

Several Regions supplement their Web page by publishing quarterly electronic newsletters, which add local detailed news, photos and articles of interest.

These e-newsletters are compiled and created by editorial teams with assistance

by AAPG staff. Region leadership provides e-newsletter oversight and final approval.

Both the **European Region** and **Asia Pacific Region** enhance AAPG member benefits for geoscientists in their parts of the world through their locally relevant news and scientific articles of regional interest.

Coming soon, the **Africa Region** will launch its maiden edition of an e-newsletter. Already, the newly formed editorial board is working with AAPG staff to design a uniquely African newsletter masthead. The region's publication is sure to offer content that spans the African continent as well as up-to-date information connecting Africa Region members with all of AAPG.

Editorial Board members are Africa Region President **James Agbenorto**, Ghana; Advisory Council member **Joe Ejedawe**, Nigeria; and HoD delegate **Almoudir Morabet**, Morocco.

Finding the IRC Home Page

To appreciate the scope of IRC Web site resources, go to the AAPG home page at www.aapg.org, then click on "International," then on "Committee." From the IRC home page you can send comments to IRC co-chairs Peter Lloyd and Marty Hewitt, or link to all IRC leadership.

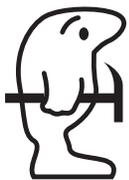
There also are reports from past IRC meetings and links to the Regions and Region leadership.

As AAPG continues to globalize, the

continued on next page

Volunteer Geologists Needed

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visit www.dgsdallas.org, or www.dgs.org

***EXPO event qualifies for 7 Texas Geological License
Board CEU's/PDH's***

Rio Call for Papers Available Online

The call for papers is available online for AAPG's next International Conference and Exhibition.

The abstract submission deadline will be in late spring.

This year's ICE will be held Nov. 15-18 in Rio de Janeiro, Brazil – AAPG's first return there since the record-setting conference in 1998 – with a technical program built on the theme "Broader, Further, Deeper."

The Associação Brasileira de Geólogos de Petróleo is the host society, and Haroldo Lima, director general of Brazil's ANP (National Petroleum Agency) is the general chair.

Organizers are planning a program

that includes 400 oral and poster sessions, more than two dozen short courses, field trips, forums, core workshops/displays and special sessions.

Appropriately, the conference will focus largely on offshore activities while also including sessions that cover upstream areas.

Primary themes are:

- ✓ Regional Geology, Paleogeography and Tectonics.
- ✓ Technology Application to E&P Environmental Solutions.
- ✓ Stratigraphy – Clastics and Carbonates.
- ✓ Reservoir Characterization – Outcrop Analogs, Surface and

Subsurface Integration in Reservoirs, Reservoir Diagenesis, EOR and Field Development Studies, Fault Networks and Fractured Reservoirs.

- ✓ Structure – Traps and Seals.
- ✓ Basin Modeling – New Concepts and Innovative Technologies.
- ✓ Petroleum Systems – Geochemistry, Source Rocks, New Technology Applications.
- ✓ Formation Evaluation and Drilling Innovations.
- ✓ Salt Basins – E&P Challenges.
- ✓ Deepwater Environments – E&P Challenges.
- ✓ Geophysics – Advances in Subsurface Imaging, Seismic and Non-

Seismic Methods, 4-D Seismic Case Studies, Visualization Technology Advances, Imaging Below Salt, Integration.

- ✓ Risk Analysis and Assessment – Economic Analysis.
 - ✓ New and Emerging Regions – New Ways to Look at Old Plays, New Opportunities in Frontier Basins.
 - ✓ Unconventional Resources – Oil Shale, Shale Gas, Tight Gas, Heavy Oil, Coalbed Methane.
 - ✓ Industry's Crew Change – Impact on Hiring, Training and Retaining Skilled Resources.
- Information can be found online at www.aapg.org/rio. □

MEETINGS ofnote

2009 U.S. Meetings

April 26-29, AAPG Southwest Section, annual meeting, Midland, Texas.

* May 3-5, AAPG Pacific Section, annual meeting, Ventura, Calif.

May 4-7, Offshore Technology Conference, annual event, Houston.

June 7-10, AAPG Annual Convention and Exhibition, Denver.

Aug. 27-28, Summer NAPE (North American Prospect Expo), AAPL, annual event, Houston.

Sept. 20-22, AAPG Eastern Section, annual meeting, Evansville, Ind.

Sept. 27-29, Gulf Coast Association of Geological Societies, AAPG, annual meeting, Shreveport, La.

Oct. 7-11, AAPG Foundation Trustee Associates, annual meeting, Ponte Verde Beach, Fla.

* Oct. 11-14, AAPG Mid-Continent Section, annual meeting, Tulsa.

2009 International Meetings

* Sept. 30-Oct. 2, Polar Petroleum Potential (3P), conference, Moscow, Russia.

Nov. 15-18, AAPG International Conference and Exhibition, annual meeting, Rio de Janeiro, Brazil.

Dec. 7-9, International Petroleum Technology Conference (AAPG-EAGE-SEG-SPE), annual meeting, Doha, Qatar.

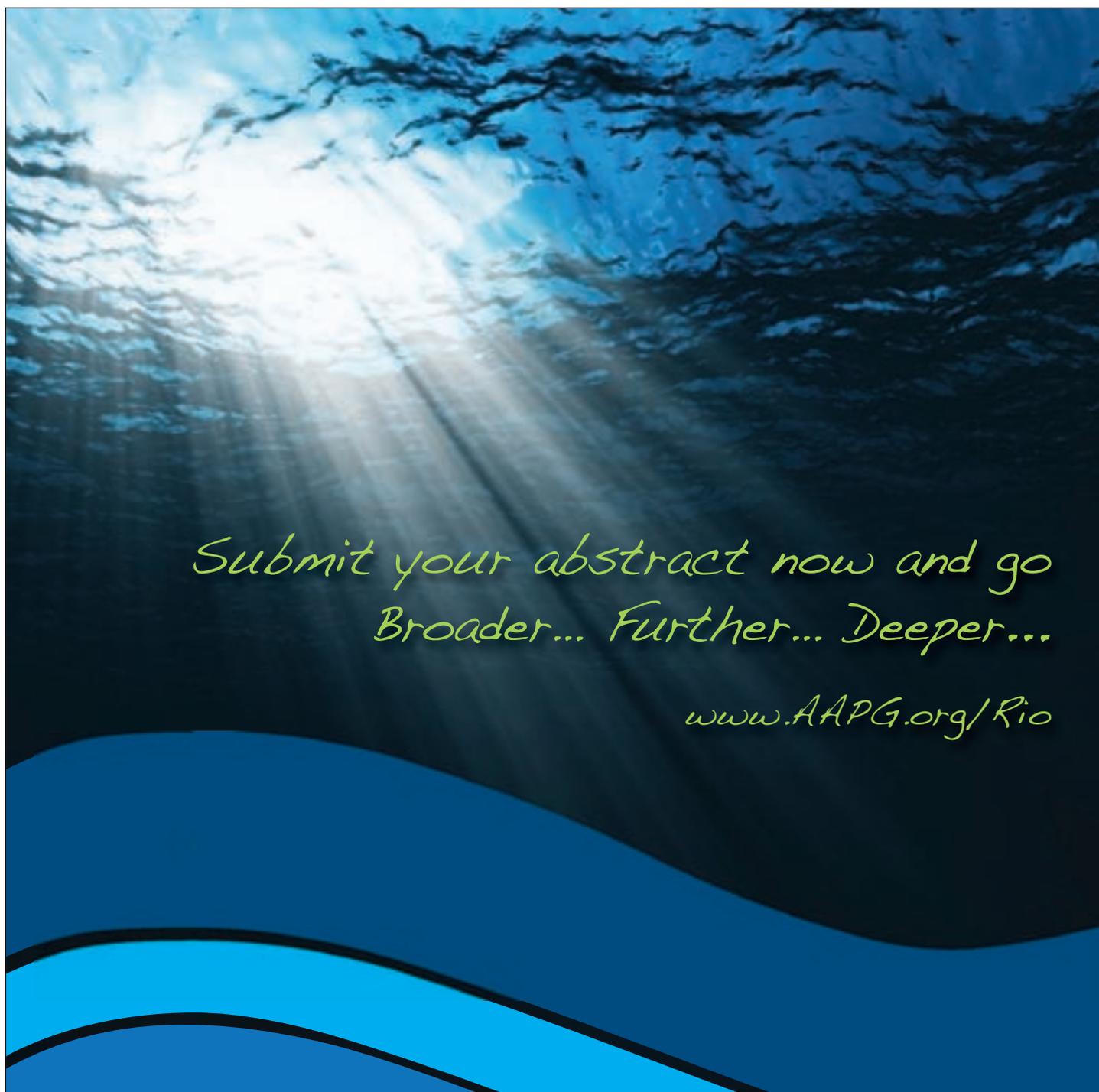
(* Denotes new or changed listing.)

continued from previous page

role of the IRC Web site will continue to facilitate international communication among geoscientists.

After all, geology knows no borders. □

(Editor's note: Peter Kahn, a petroleum geologist working on domestic and international projects in Samson's Houston office, is vice-chair for the International Regions Committee. Peter Lloyd, of Heriot Watt University's Institute of Petroleum Engineering, is an AAPG Honorary member and International Regions Committee co-chair.)



AAPG 2009 International Conference & Exhibition

Rio de Janeiro, Brazil • 15-18 November



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Member Dues Statements Will Be Delivered by Mail

In last month's EXPLORER the membership was advised that the 2009-10 dues statements would be delivered electronically to those for whom AAPG has e-mail addresses.

Recognizing the need for some improvements to this service before full implementation, dues statements also will be delivered by postal mail as in previous years.

Statements were mailed during late March.

Members are still able to pay

their dues via the Members Only site.

"We look forward to offering you electronic billing in the future," said Vicki Beighle, AAPG's Member Services manager.

"Members may still pay online via Members Only," she added, "and the membership will receive an e-mail notification when payment may be accepted for the 2009-10 fiscal year." □

MEMBERSHIP & certification

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

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

Information included here comes from the AAPG membership department.

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

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

Colombia

Peralta, Juan D., Schlumberger, Bogota (C. Arango, R. Higgs, F. Audemard)

England

Ivory, Colin William, Ophir Energy, London (reinstate)

Ghana

Quaye, Joechida Addoquaye, Ghana Geological Survey, Accra (J.K. Agbenorto, M.N. Aryeetey, I.A. Botchway)

India

Bhardwaj, Sumit, Cairn India Pty Ltd, Gurgaon, Haryana (S. Sanyal, S. Sarkar, P.M. Compton)

Indonesia

Syafron, Edward, BP Indonesia, Jakarta (H. Darman, S.I. Qivayanti, D.H. Samsu)

Madagascar

Rasoanandrianina, Lalanirina, consultant, Antananarivo (F.L. Rittelmeyer, D.R. Goodbread, D.N. Clark)

Netherlands

George, Phlemon, Shell International EP, Rijswijk (H. Darman, A. Yahya, J.F. Boels)

Nigeria

Adelaja, Adeniyi Temitope, Anadarko, Ikoyi, Lagos (A.A. Adesida, V.F. Agbe-Davies, O.T. Odusote); **Schlicht, Peter**, Schlumberger, Lagos (N.F. Hurley, S.M. Hansen, R.J. Davis)

Norway

Goswami, Jyotipuspa, Wintershal Norge,

continued on next page

For Active Membership

Colorado

Gackle, Dean R., Petro-Canada Resources, Denver (K.Y. Macaluso, M.T. Hocker, K.T. Dean); **Henry, Maria Wood**, Henry GeoConsulting Services, Denver (R.L. Billingsley, K. Jagiello, A.M. Logan); **Lareau, Heather L.**, EnCana Oil & Gas (USA), Denver (R.S. Martinsen, W.S. Houston, M.D. Brittenham)

Indiana

Gebhardt, Gene Allen, Core Minerals Operating, Evansville (R.L. Sumner, J.T. Smith, R.L. Snyder Jr.)

New York

Hulseapple, Scott M., Alpha Geoscience, Clifton Park (S.M. Vinci, K. Sanford, S. Gowan)

Oklahoma

Cotton, Ray, Questar Exploration and Production, Tulsa (R.O. Lindsay, D. Bocanegra, P.E. Byrd); **Kolar, Kirk Calvin**, SandRidge Energy, Oklahoma City (reinstate); **Poor, Jami M.**, MAP, Oklahoma City (L.H. Davis, S.H. Formhals, R.J. Krakowski)

Texas

Benedetto, Eleazar Jose, Roxar, Houston (P.A. Santogrossi, K.S. Hoffman, A.F. Callejon); **Brady, Bruce M.**, Great Western Drilling, Midland (J.M. Party, R.P. Richards, E.M. Sebring); **Broughton, Harvin Lienhard**, Concho Resources, Midland (J.M. Party, C.W. Reynolds, D.M. Thomas III); **Dieteren, Marcel Juliana**, RPS Energy, Houston (J.V. Brink, R.T. Dick, P. Fearn); **Fiske, Douglas Andrew**, Fiske Energy, Midland (J.M. Party, E.M. Sebring, W.R. Creech); **Goggin, Keith E.**, Weatherford/OMNI Laboratories, Sugar Land (D.J. Schultz, J.M. Rine, J.T. Haynes); **Henderson, Scott D.**, ExxonMobil, The Woodlands (D.G. Carpenter, J.M. Lohmar, J.F. Collins); **Judy, Steven C.**, Rocksource Energy, Katy (G.J. Wilson Jr., J.S. Laurent, J.V. Richards); **Lee, Yir-Der Eddy**, Shell International E&P, Houston (R.C. Shipp, J.L. Gibson, C. Feng); **Long, Vance**, Largetex Resources, Abilene (J.A. Jones, D.G. Morris, D.L. Mauldin); **Paine, Jeffrey G.**, University of Texas at Austin, Austin (C.G. Groat, S.W. Tinker, R.V. Petrossian); **Pershhouse, Jonathan**, J-W Operating Company, Dallas (R.E. Brown, G.A. Jenner, N.J. House); **Smith, Andrew Peter**, Horizontal Solutions International, Carrollton (reinstate); **Voight, Kenneth Charles**, PetroTel, Dallas (reinstate); **Winstanley, Stephen**, Anadarko Petroleum, The Woodlands (S.H. Mentemeir, M.E. Podell, R.L. Kirkland)

Australia

Daws, Julie, Tap Oil, Perth (J.T. Jong, J.P. Scibiorski, S.A. Pagnozzi); **Mee, Benjamin Craig**, Woodside Energy, Perth (V. Cutten, C.W. McCrone, A.E. Di Toro Giovanni)

Brazil

Goncalves, Felix, Vale E&P, Rio de Janeiro (M.R. Mello, N.C. Azambuja Filho, J.M. Macedo)

Canada

Eisinger, Chris L., University of Calgary, Calgary (J.L. Jensen, S.M. Hubbard, D.C. Lawton)

Certification

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

Petroleum Geologists

Oklahoma

Kathy Gentry, Sandridge Energy, Shawnee (Society of Independent Professional Earth Scientists); **Harold Hanke**, consultant, Oklahoma City (Society of Independent Professional Earth Scientists); **Gregory A. Riepl**, independent, Oklahoma City (Society of Independent Professional Earth Scientists)

Texas

Richard J. Erdlac Jr., Erdlac Energy Consulting, Midland (Society of Independent Professional Earth Scientists); **Marc D. Maddox**, Maddox Oil Properties, Midland (Society of Independent Professional Earth Scientists); **John M. Pezzetta**, self-employed, Houston (Society of Independent Professional Earth Scientists); **Joe Simo**, King Operating Corp., Dallas (Society of Independent Professional Earth Scientists); **D. Craig Smith**, independent, Midland (Society of Independent Professional Earth Scientists); **David M. Thomas III**, Trey Resources, Midland (Society of Independent Professional Earth Scientists); **James L. Wilson, J.L.** Wilson and Associates, Spring (Society of Independent Professional Earth Scientists)

Petroleum Geophysicist

Texas

David R. Wood, self-employed, Sugar Land (Society of Independent Professional Earth Scientists)



2009 COURSES

- **Deepwater Clastics**
- **Deepwater Reservoirs: An Integrated Course and Field Seminar**
- **August 3-5, 2009**
- **October 19-23, 2009**
- **Durango, Colorado**
- **Tabernas and Sorbas Basins, Spain**
- **\$1,400.00 per person**
- **\$2,950.00 per person**
- **Includes tuition, course notes, CD and lunches**
- **Includes tuition, guidebook, ground transport, some meals**

Details & registration:
www.cosseygeo.com
or email: cosseygeo@aol.com
or call +1 (970) 385 4800



UPCOMING REGIONAL WORKSHOPS

4/21 **Midcontinent**: Applied Reservoir Geology for Engineers - Tulsa, OK. Contact: 918-241-5801

4/22 **Rocky Mountain**: Completions and Stimulations for Geologists (Minot State Univ.) - Minot, ND. Contact: 303-273-3107

4/22 **Central/Eastern Gulf**: Alternative Energy; Sustainable Development in a Challenging Economy (LSU Center for Energy Studies) - Lafayette, LA. Contact: 225-578-4538

4/TBD **Central/Eastern Gulf**: Sequence Stratigraphy and Its Application to Petroleum Exploration in Onshore Mesozoic Salt Basins, Gulf Coastal Plain - Lafayette, LA. Contact: 225-578-4538

5/15 **Rocky Mountain**: GeoGraphix Training; An Overview and Refresher Course - Golden, CO. Contact: 303-273-3107

5/19-20 **Central/Eastern Gulf**: Louisiana Oil and Gas Symposium (Baton Rouge Geological Society, Louisiana Geological Survey, LSU Center for Energy Studies, Louisiana Oil and Gas Association) - Baton Rouge, LA. Contact: 225-578-4538

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

Read the latest online edition
of PTTC's *Network News*

www.pttc.org/newsletter_press.htm



WWWupdate

AAPG Offers Social Networking Sites

By JANET BRISTER
AAPG Web Site Editor

Are you on Facebook? Do you use Twitter? Have you a LinkedIn account? Can I find you in Loopt?

Does this matter?

It might, because these are social-networking tools that are designed to help you stay in touch with family, friends and business associates.

Most of them ask the question, "What's up?" in some fashion.

Each are Web-based but include mobile phone versions, so you don't have to leave home without it.

Let's take a look at "Janet." She's a professional who works for a nonprofit organization and has an account in each of these services.

Janet signed up with LinkedIn because all her professional associates were bugging her to join. So far, it's not led to much help – but Janet's not in sales nor does she have need to develop any leads. Still, should Janet ever go freelance ...

Janet's son called and told her about his Loopt account, so she got one, too. Now she knows when he is having lunch and where. Or he can see she's at home from work because Loopt is more of a social compass that uses GPS to follow your movements.

Handy should they want to meet up for lunch (but it is a bit of a drive with him in D.C. and her in Oklahoma).

Now Janet hears about this great picture on Facebook, but she has to get an account to view it because none of this is public. Only "friends" can view your Facebook pages – and those friends must have accounts, too.

Janet now posts to her wall frequently filling in the blank to complete the phrase "Janet is ..." This was pretty cool because now she's reconnected with friends and her family keeps her up-to-date with what they are doing.

It's a lazy way to write a letter.

What Are You Doing Now?

Then along came Twitter. Janet heard people talking about Tweeting others, and then read an article how congressmen are Twittering.

Curiosity led to the Twitter account, where Janet answered the question, "What are you doing now?" and then began to note who she'd like to follow. (She passed on Britney Spears and MC Hammer but is considering Time, Demi Moore and Tony Hawk – not!)

The idea behind Twitter is you can follow trends, people and other "stuff" of interest to you but can ignore any message that's sent your way if you're just not in the mood to know.

So, are you in or not?

Connect with AAPG

If you are a Facebook user, check out AAPG's Facebook Group. The easiest way to find us is simply by searching for 'AAPG' once you're logged in to the site. There, you can find links to our many active Student Chapter groups as well as connect and network with individuals.



There also is a Facebook Group maintained by the AAPG Young Professionals that features a calendar,

discussion board and a wall for posting messages.

If Twitter is your thing, the AAPG Student Outlook blog's updates are also served through Twitter. To keep up on the latest information for Student Chapters, check out <http://twitter.com/aapgstudents>.

In addition, AAPG has four blogs: Student Outlook, GEO_DC, Learn! and the wwwUpdate blog.

With these opportunities, AAPG members have lots of opportunities to engage other members – and enlarge your network.

Good browsing! ☐

Did you know that AAPG members could save up to \$327.96 or more a year on auto insurance?



You may already know that American Association of Petroleum Geologists members like you can get a special group discount on auto insurance through Liberty Mutual's Group Savings Plus® program.* But did you know that Liberty Mutual offers many other discounts on both auto and home insurance? In fact, you could save up to \$327.96 or more a year on auto insurance alone.** And you could save even more by insuring your home, as well.

To learn more about all the valuable savings and benefits available from a Liberty Mutual auto or home policy, contact us today.

continued from previous page

Stavanger (R. Mohanty, R. Gupta, N. Sinha); Rotevatn, Atle, Rocksource, Bergen (J.A. Howell, H. Fossen, E. Graue); Thurmond, John B., StatoilHydro, Bergen (O.J. Martinsen, I.R. Sharp, B.A. Tocher)

Pakistan

Moghal, Muhammad Anwar, Pakistan Petroleum, Karachi (M.R. Khan, M. Raza, R. Siddiqui)

Russia

Kaygorodtsev, Evgeny, Chevron, Moscow (K. Sandarusi, R.K. Foster, D. Sazonenko)

Saudi Arabia

Otaibi, Mohammed H., Saudi Aramco, Dhahran (B.E. Gratto, C.J. Heine, S. Hayton); Yang, Yunlai, Saudi Aramco, Ras Tanura (J. Iliffe, I.M. Billing, A. Bhullar) ☐

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READERS' forum

North to Alaska

Regarding your story "Prudhoe Bay Took a Total Team" (an excerpt of Foundation Trustee Associate John Sweet's new book, "Discovery at Prudhoe Bay," March EXPLORER): This is a great story of Frontier Exploration in its truest sense.

John Sweet was my first supervisor in Billings, Mont., when I broke out in 1957. The book is a textbook of what is frontier oil exploration – and he wrote it for both oil patch folks and lay folks interested in what we do.

Thank you AAPG EXPLORER for a fine article.

Jim Barkdull
Morrison, Colo.

Behind the Scenes

I sent your article about the two AAPG members who made the popular oil company advertisement (Erik Oswald and Kim Bates, November EXPLORER) to my daughter in Los Angeles, who is a photo-OP stylist, for her comments.

She wrote back to me:

"... I got your letter. The things the geologists said about filming the commercial were true and simply put. I guess this is why they were chosen to speak to the general public.

"We had a laugh at what he said about the wardrobe department. It was all true. The amount of clothes is mind blowing and the attention to detail bewilders most people. But what he [they] didn't even realize is what happens prior to and after the shoot day ... The process of getting direction from a director and then sharing it with assistants who help shop [for the wardrobe].

"Sometimes I will just pick up whatever catches my eye in the store and

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.

then assemble the look in my studio before we shoot. When the 'talent' arrives you try things on them, and whatever works best is [becomes] the outfit ...

"After the day, all clothes, accessories and shoes are packed back into our cars, unpacked in my studio and then we have to sort them into piles of which store we got them. They have to be in the same order as they were when they were taken out to make it quicker for the store to check in. We have a special office in the stores in which we do this so as not to mess with commissions of regular employees, etc. Then starts the process of compiling original receipts with return receipts and making grand totals to invoice.

"This all happens in about three days."

Richard H. Sams
Atlanta, Ga.



Oswald



Can a life be changed in seven minutes? AAPG has a creative way to find out, thanks to a new PowerPoint show – complete with musical soundtrack – called "Why Geosciences?" created by Joanne Billingsley (wife of past AAPG president Lee Billingsley) specifically for student groups, to encourage and promote careers in the geosciences. The presentation is available free of charge, and can be found online at www.aapg.org/k12resources/GeoscienceExplained.cfm.

DPA

from page 50

Methods used to address the risk factors that cause dry holes will be reviewed.

All three courses are worthy of consideration, especially for the younger members of the profession.

* * *

Finally, the DPA will be co-hosting (DEG/DPA/EMD) an Energy Forum on Tuesday afternoon dealing with carbon dioxide and sequestration. The speakers will include:

✓ Hannes Leetaru, of the Illinois State Geological Survey, speaking on

"Our Energy Future: Wind, Solar, Nuclear and Coal with Sequestration."

✓ Sue Hovorka, Distinguished Lecturer from the University of Texas at Austin, Jackson School of Geosciences, speaking on "Risks and Benefits of Geologic Sequestration of Carbon Dioxide – How Do the Pieces Fit?"

✓ John Kaldi, of the University of Adelaide, an AAPG Honorary member and current international Distinguished Lecturer, speaking on "CO₂ Sequestration – The View from Down Under."

Once again, the timeliness of this forum is incredible considering the upcoming emphasis on "green energy" and the nation's new administration's direction toward a cleaner environment.

Make your plans soon and join us in Denver! □

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Inmemory

Rex Monahan, a founding member of the AAPG Trustee Associates and winner of the 2003 Michel T. Halbouty Human Needs Award, died Jan. 19 in Sterling, Colo. He was 84.

Monahan, an independent geologist, had bachelor degrees in psychology and geology from the University of Nebraska and, at the age of 65, received an MBA from Regis College.

He received the Halbouty Award for his many philanthropic activities, and was inducted into the American Weightlifting Association Hall of Fame in 2002.

Carl H. Atchison, 93
San Diego, October 2008
Lorraine Druyff, 59
Denver, Nov. 19, 2008

Stan A. Kanik (EM '55)
Sidney, Canada
Rex Monahan, 84
Sterling, Colo., Jan. 19, 2009
Ervin C. Philpy, 85
Midland, Texas, Jan. 11, 2009
Gene D. Wilson, 85
Albuquerque, N.M., Jan. 8, 2009

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

CLASSIFIEDads

POSITION AVAILABLE

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GX Technology, a subsidiary of ION Geophysical Corporation is a leading provider of Image Driven seismic solutions with international geophysical data processing centers in Houston, London, Denver, Trinidad, Angola, Nigeria, Moscow and Cairo. GXT's advanced imaging technology is used to produce the highest fidelity land and marine Multi Client and proprietary data. The company's solutions incorporate a comprehensive toolkit which enables seismic acquisition contractors and oil and gas companies to design and implement successful 2D, 3D, 4D and full-wave land and marine seismic surveys anywhere in the world.

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- Experience in seismic data analysis, parameter testing and development of processing flows
- Able to present seismic data to clients
- Decision making skills along with problem identification combined with the ability to formulate solutions
- Well developed communication and leadership skills
- Promax experience is a plus
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RUTGERS

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The Department of Earth and Planetary Sciences and the School of Business are seeking to fill an endowed chair at the level of Full Professor or above with tenure. The successful candidate should have broad knowledge and experience in Earth Sciences related to energy and climate as well as an understanding of relevant economic and business policies. A Ph.D. in Earth Sciences and advanced studies in economics and business are required;

experience with energy valuation models is desired.

We seek to build on existing strengths: 1) the geology of energy, basin analysis, global biogeochemistry, and geophysics; 2) a growing Energy Institute, with interests in carbon sequestration, biofuels, photovoltaics, and wind energy, and 3) a top ranked business school. The successful candidate will take the lead in developing research, teaching, and service in energy and the Earth. Expertise in evaluating commercial prospects of energy-oriented technologies is desired. Candidates with exemplary records in academia, government or business are encouraged to apply.

The salary range is competitive, commensurate with experience and qualifications. Review will begin on June 1, 2009 and will continue until the position is filled. Applicants should submit a letter of interest, curriculum vitae, and the names and contact information for at least three references. All correspondence should be emailed to:

Michael Carr, Chair
Search Committee for Bennett L. Smith Chair
School of Arts & Sciences, Rutgers University
77 Hamilton St., New Brunswick, NJ 08901
732 932 7494
carr@rutgers.edu

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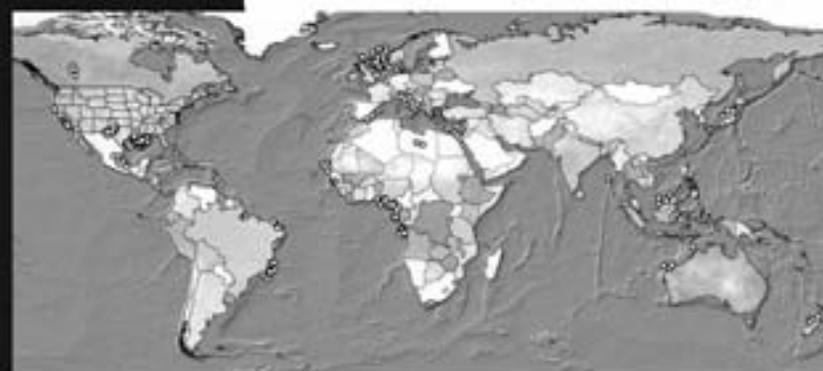
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DIRECTOR'S corner

Opportunities Exist Now for AAPG

By RICK FRITZ

I am writing my column as I am returning from a very successful APPEX meeting in London, where I had the privilege of attending an open house of the new AAPG European Office in London.



Fritz

Located at the edge of the Soho district near the Geological Society of London, the office comprises two large rooms – one for staff and the other a conference room used especially for European Region meetings.

AAPG had been using office space donated by the Royal School of Mines at Imperial College for the past several years, but our agreement with the college was at an end – and the AAPG European office needed more space now that it has three staff.

AAPG indeed appreciates the generous support provided by Imperial College over the past several years in helping the fledgling office get established. We especially appreciate Dr. Howard Johnson and the support of Imperial College's professors, students and staff.

Steve Veal, a past AAPG treasurer, is the director of the European Region office. Lika Chambers is conference manager and January Arnold is the office assistant.

The London office is an extension of AAPG headquarters, and its primary duties are to support the membership and leadership in the European Region by

The offices are critical to provide member services; they also provide a liability shield and tax and finance advantages.

providing membership services such as conferences, workshops, short courses and technical lunches.

Six years ago AAPG decided to decentralize some of its operations in order to provide member services worldwide. As a result two types of offices were considered to extend operations:

✓ A "Type I" office, with the minimum of three staffers – a director, conference manager and office assistant. Designed to be profitable in two-three years.

✓ A "Type II" office, with one director or manager; typically this type has only one employee who supports the Region leadership and provides basic membership services. It is designed at best to break-even, characteristically a joint office with another society.

The Middle East Office was recently approved as a Type I office, and incorporation should be complete this spring. AAPG plans to office with our GEO Middle East partner, Arabian Exhibition Management in Manama, Bahrain.

Abeer Al-Zubaidi is the director of the Middle Office, and she has been very busy contacting companies for program

support and memberships. We recently completed a joint educational conference with the Dhahran Geoscience Society the Society of Exploration Geophysicists and the European Association of Geoscientists and Engineers.

One of the primary duties of the Middle East office is to work with the Middle East Region council in the development of the technical program for GEO Middle East, which will be held in March 2010.

In addition, Abeer is working to develop several Geoscience Technology Workshops, or GTWs. These workshops are designed for quick development on current "hot" topics (see related story, page 36).

The Middle East and European offices also are working on a joint GTW on Unconventional Gas Resources. It is scheduled for June 22 -24 in Istanbul, Turkey.

Additionally, the AAPG Executive Committee has approved the development of a Type II Region office in Singapore. We are currently applying for incorporation in Singapore. An office site has been selected, and Alan Wegener, AAPG's global development director, and Carol McGowan, AAPG's Regions and Sections manager, are interviewing

potential prospects to run the office.

* * *

Of course, AAPG's first extended office is the GEO-DC office in Washington, D.C. David Curtiss is the director of this office, and he is very busy providing information to congress and the administration.

The Division of Professional Affairs also supports this office with volunteers and partial financial support.

Additionally, AAPG is considering a Type II office in Calgary to extend services. We also are considering an offer by SPE to rent a small office in Houston. Future expansion of the current office and development of new offices will depend greatly on the economic situation.

* * *

We continue to evaluate the economy of opening offices worldwide. A recession is not necessarily the best time to expand. But as AAPG expands, the offices are critical to provide member services.

The offices also provide a liability shield plus tax and finance advantages for the Association.

The reality is the opportunities exist now. Opportunities always look bigger going than coming, so it is important we continue to follow our strategic goals.

'Heady' reasons to come to Denver

DPA Has Full Slate of Activities

By CLIFF CLARK
DPA Annual Meeting
Vice Chair

The Division of Professional Affairs will have an exciting and active profile at the upcoming AAPG Annual Convention and Exhibition, set June 7-10 in Denver, the "Queen City of the Plains."



Clark

The meeting, in fact, continues an exciting and active streak for Denver itself, which has been showcased twice recently during historic national events – hosting the Democratic National Convention in August 2008 and being the site where President Barack Obama signed the American Recovery and Investment Act. Both were of significant national importance, and Denver rose to the occasions.

Further evidence of Denver's unique qualifications for hosting a memorable annual convention is that our mayor, John Hickenlooper, is a member of AAPG!

In fact, Hickenlooper was a geologist-turned brewpub pioneer who throughout his career in the energy industry had never run for political office.

(It is also interesting to note that Colorado is number one in craft brews per capita in the United States, boasting 101 breweries as of 2008 – a "heady" enough reason by itself to visit Denver this June!)

Largely as a result of being the entrepreneur that he is – and because of his civic involvement in numerous causes – "Hick" was elected mayor of Denver in 2003 and re-elected in 2005. There is no doubt that his creative leadership and innovative thinking helped draw these two significant national events to Denver.

Hickenlooper will be speaking at the DPA luncheon on Tuesday, June 9, about "Professionalism and Public Policy," focusing on the importance of maintaining professionalism and high ethical standards in everything that we, as professional geologists, must maintain – especially when interacting with the non-technical public that may not understand our profession.

This matters, because whether it be a simple discussion with the public about anything geological, energy or minerals related, or public testimony before a regulatory body, consideration must be given to maintaining the highest professional and ethical standards. Due



to increased public awareness of energy and climate change issues our profession is increasingly being called upon for scientific input and guidance. Remember, you are not only representing yourself, but the entire geologic community!

So sign up soon when you register for the convention for this exciting talk, as this event will likely sell out early.

* * *

Other DPA activities for Denver include three DPA-sponsored short courses and a special forum on carbon dioxide issues.

The short courses are:

✓ Reservoir Engineering for Geologists, taught by Stephen Norris, a practicing reservoir engineer, which will focus on familiarizing geologists with a basic understanding of common reservoir engineering methods and practices.

The basics of petroleum economics will be presented, including the time value of money, interest calculations, cash flow models, ROR, NPV and other economic metrics.

✓ Black Belt Ethics, taught by Bob Shoup, will highlight the critical importance of adhering to "martial arts" tenets and code of honor – respect, courtesy, integrity, perseverance, self-control, courage and community.

This course will review these tenets and how they can be applied in our professional lives.

✓ Quality Control for Subsurface Maps will show that success is not the result of serendipity, but is based on solid scientific work. A systematic approach for quickly screening interpretations, maps, prospects and potential resources will be developed and presented.

AAPG's Division of Professional Affairs will honor several of its own in Denver.

DPA award winners are:

☐ Past President Award – Thomas E. Ewing, San Antonio.

☐ Life Membership – Peter R. Rose, Austin, Texas.

☐ Distinguished Service Award – Daniel J. Tearpock, Houston.

☐ Certificate of Merit awards:

✓ Carl J. Smith, Morgantown, W.Va.

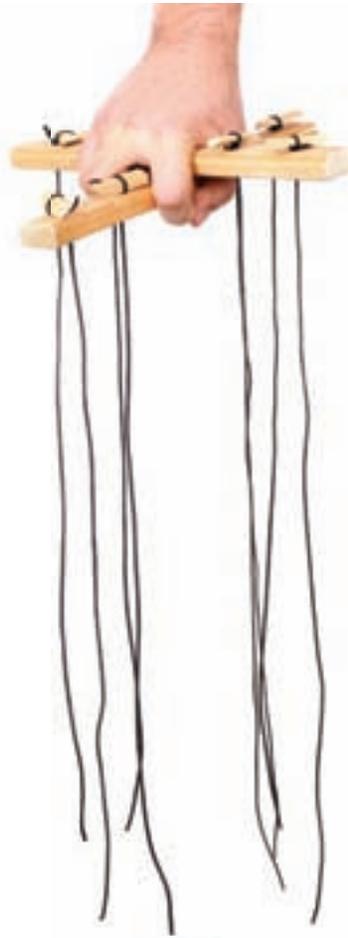
✓ Charles A. Sternbach, Houston.

✓ Martha M. Guethle, San Antonio.

✓ Mark A. Norville, San Antonio.

See DPA, page 48

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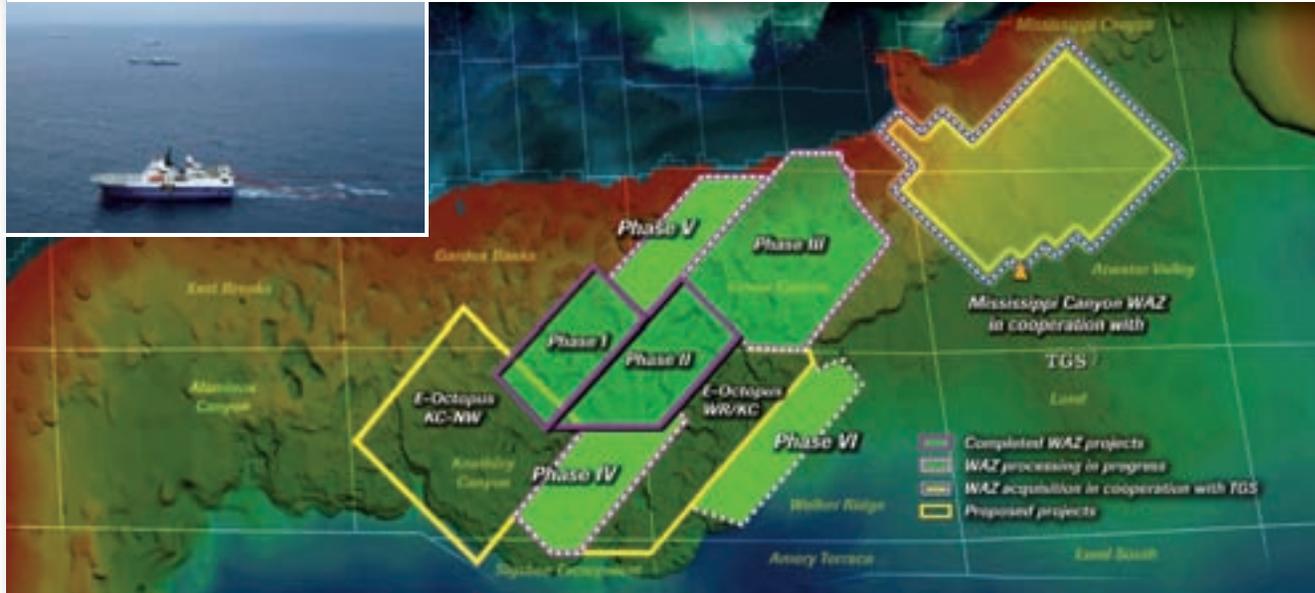
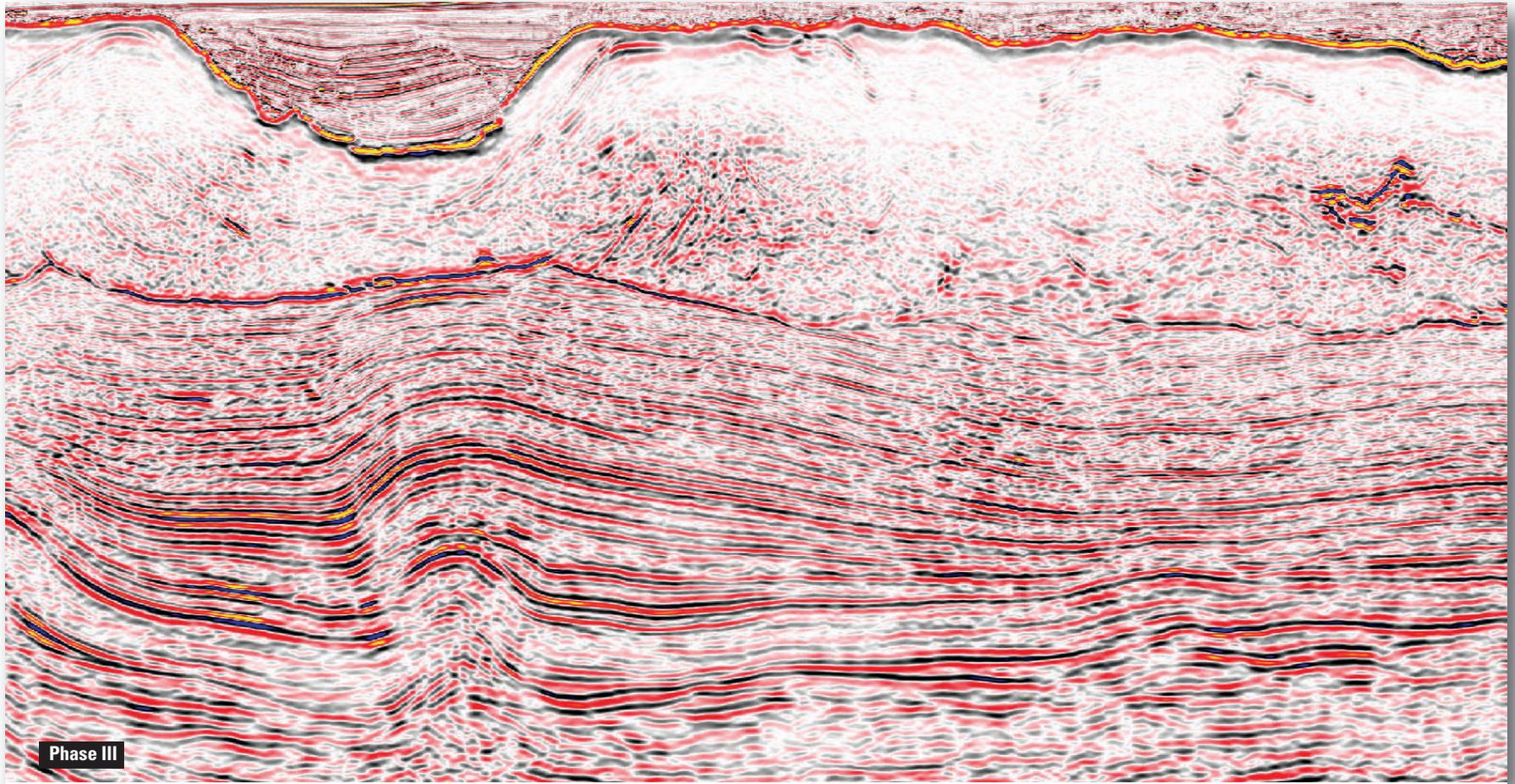
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