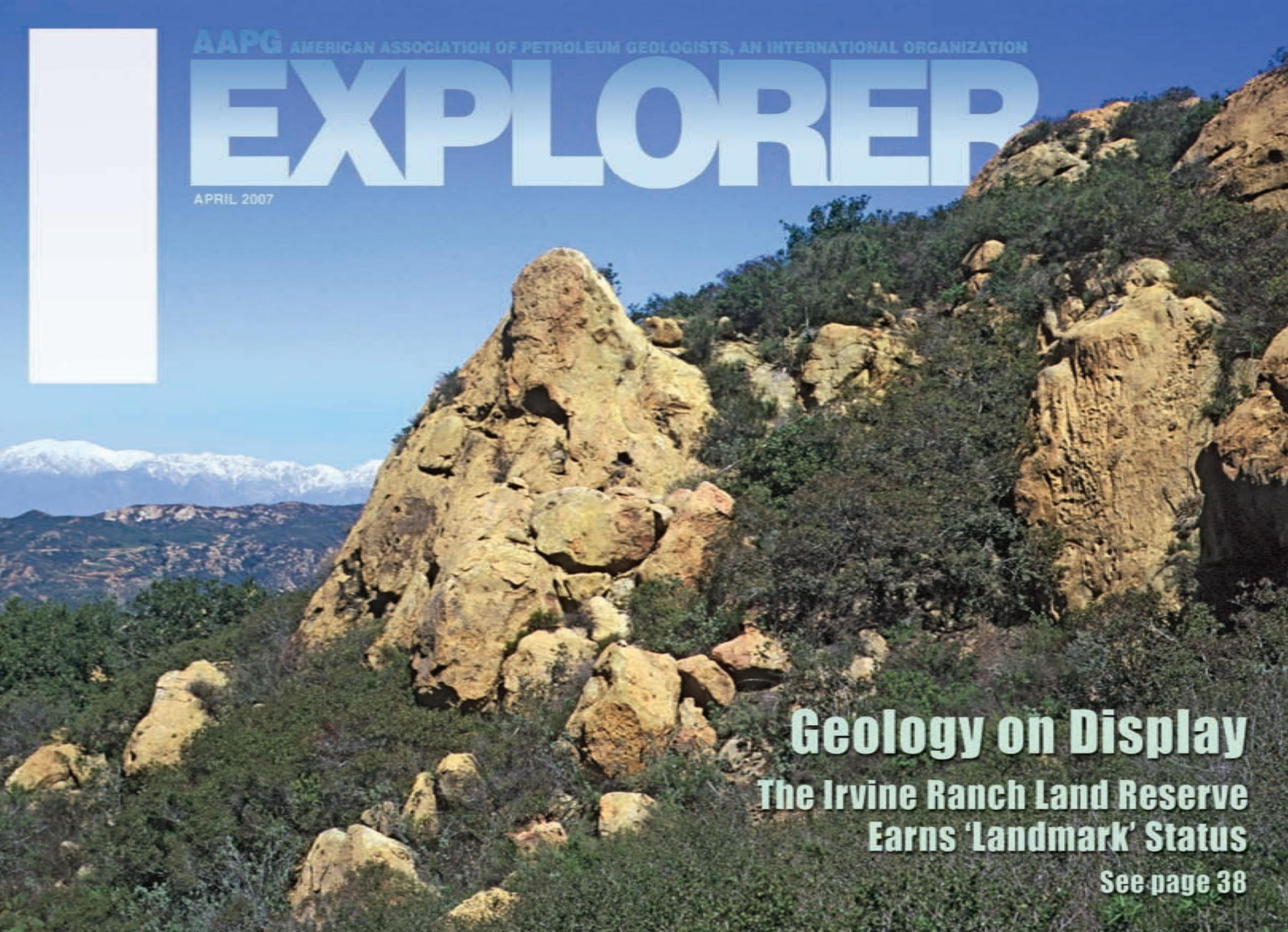


AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

# EXPLORER

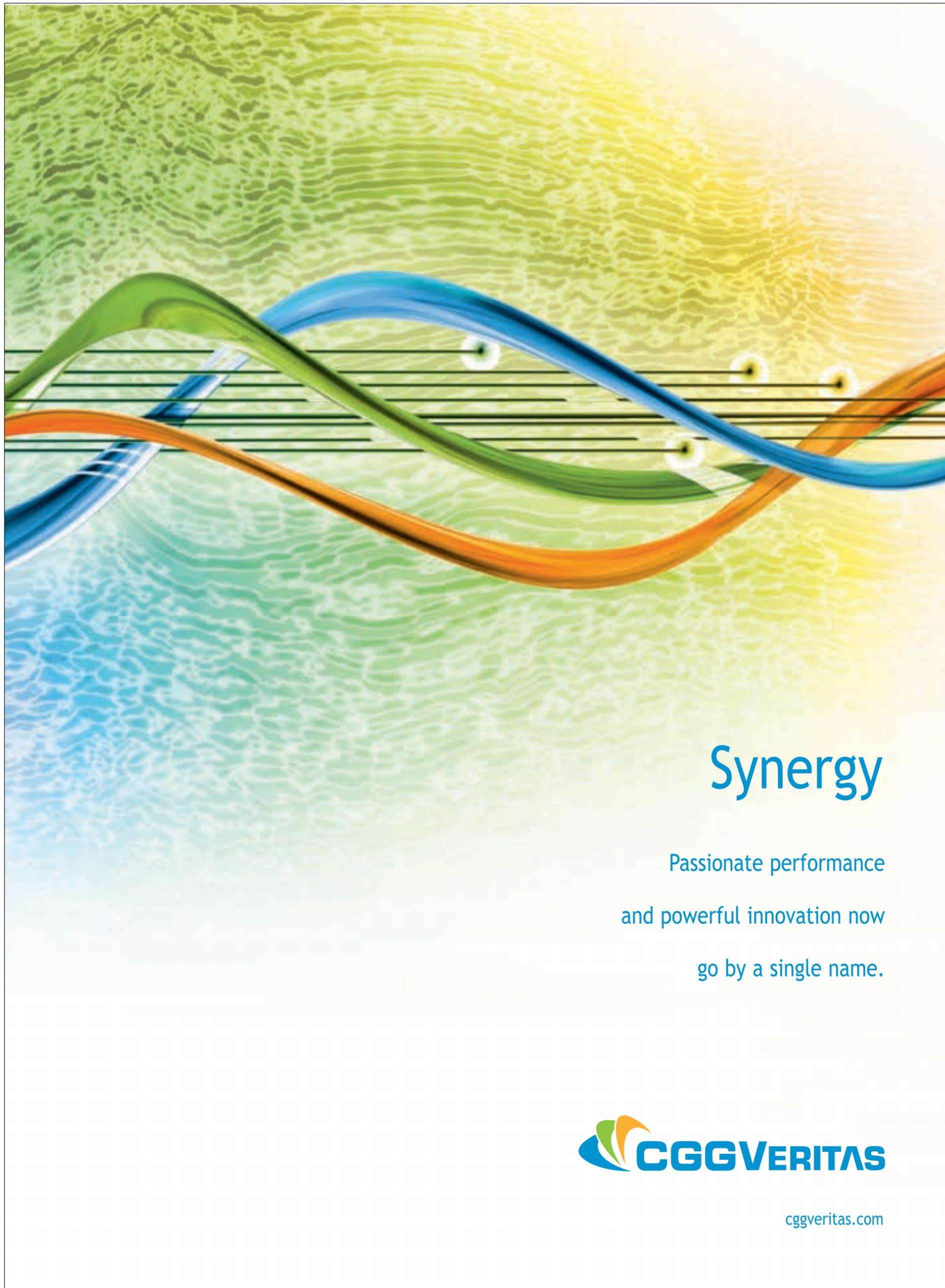
APRIL 2007



## **Geology on Display**

**The Irvine Ranch Land Reserve  
Earns 'Landmark' Status**

**See page 38**



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**On the cover:** Preserving and presenting – this view is of the Fremont Canyon Wilderness Area, which is part of California’s 37,000-acre Irvine Ranch Land Reserve, a geologic wonderland that recently became the first site in California to be designated a National Natural Landmark. Located in southern California near Los Angeles, more than 30 percent of the land is privately owned – but it will now be preserved for public visits and scientific study. See story on page 38. Photo by Stephen Francis.

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Photo courtesy of Gil Mull

Alaska: Some of the world’s most spectacular geology will be viewed and visited as part of a new AAPG GeoTour, “Geological Tour Through Alaska: A Trans-Alaskan Transect – Gulf of Alaska to Prudhoe Bay.” The tour, designed for geologists and nature lovers alike, takes place June 2-11, and is one of a dozen AAPG education department offerings in the coming months. For complete details see [www.aapg.org](http://www.aapg.org).

## PRESIDENT’S COLUMN

# ‘Paying It Forward’ Has Dividends, Too

By LEE T. BILLINGSLEY

In February, AAPG was host for the annual Leadership Conference in Tulsa. We invited all affiliated society presidents, committee chairs and others in various leadership positions in AAPG.

The invitation gave me an odd feeling, because I felt like we were imposing on the lives of busy, professional geologists. Plus, the AAPG staff spends considerable time planning the event and then spending their weekend with us.

What if no one wanted to come? What if our planned program was a flop?

Executive Director Rick Fritz, a veteran of many Leadership Conferences, assured me that attendees would be fulfilled by the weekend because, if for no other reason, they would enjoy visiting with each other. As the weekend began my fears soon disappeared, buoyed by the enthusiasm and quality of the attendees and the AAPG staff.

The conference was very successful as it fulfilled its three objectives:

- ✓ Describe and discuss new ideas, programs and policies by AAPG.
- ✓ Receive reaction and new ideas from attendees.
- ✓ Allow AAPG and local leaders to network and share ideas.

\* \* \*

As I pondered the question, “Why do busy geologists travel to Tulsa for a

weekend or volunteer to lead an annual convention?” three main categories came to mind:



Billingsley

□ **Social networking.** In situations where you work together on a common project, people can become friends.

In the volunteer world, unlike some professional situations, you have some flexibility to choose your teammates.

When accomplished, retired athletes are asked what they miss most during retirement, they usually reply, “My teammates.” So it can also become when working in a committee or planning a convention: We like to spend time with our friends.

□ **Professional improvement.** More than one AAPG leader has described how their professional career improved after they learned the role of a volunteer leader.

In professional settings managers may think their position alone will earn respect and performance from workers, but in a volunteer setting you must earn all your respect and performance. Unmotivated volunteers do not quit, but

See **President**, page 6

## AAPG Candidate Balloting Continues

Voting continues online for the 2007 slate of AAPG officer candidates, and paper ballots are also being accepted.

Biographies, pictures and statements from all candidates for AAPG office remain available for viewing on the AAPG Web site, [www.aapg.org](http://www.aapg.org).

The candidates were given the opportunity to respond briefly to the subject: “Why I Accepted the Invitation to be a Candidate for an AAPG Office.”

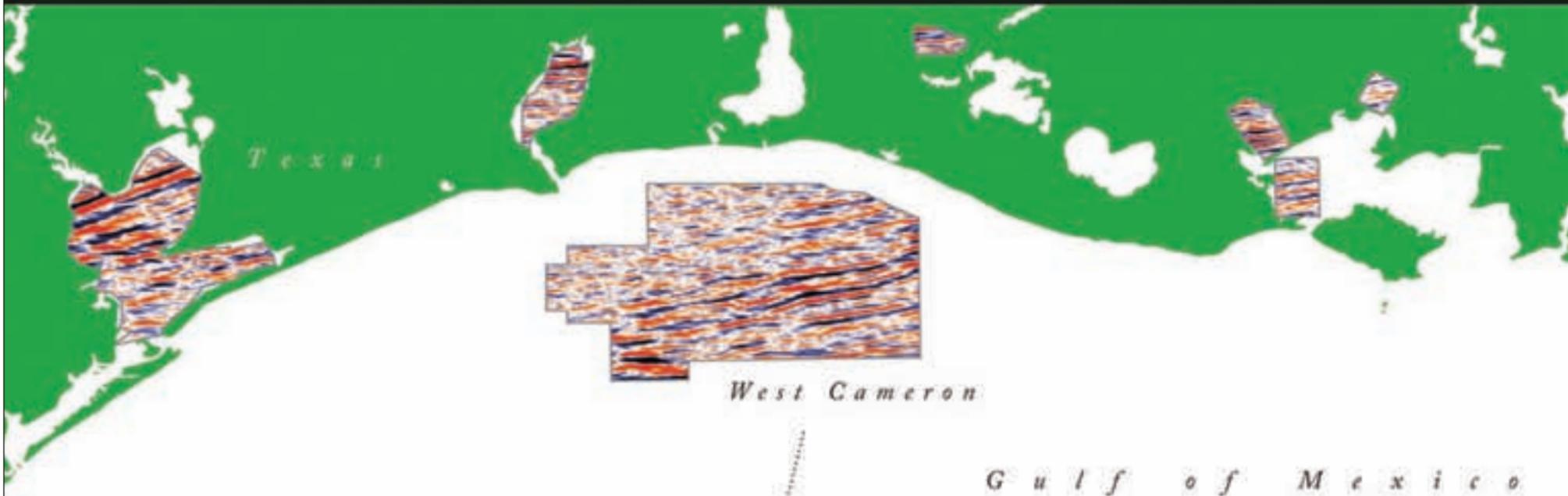
Responses and biographical information were provided by each candidate and edited only for grammar, spelling and format.

This information, which will remain online through the election period, also appeared as an insert in the January EXPLORER.

Online balloting will be made available through midnight, May 15. Ballots will be counted on May 16. □

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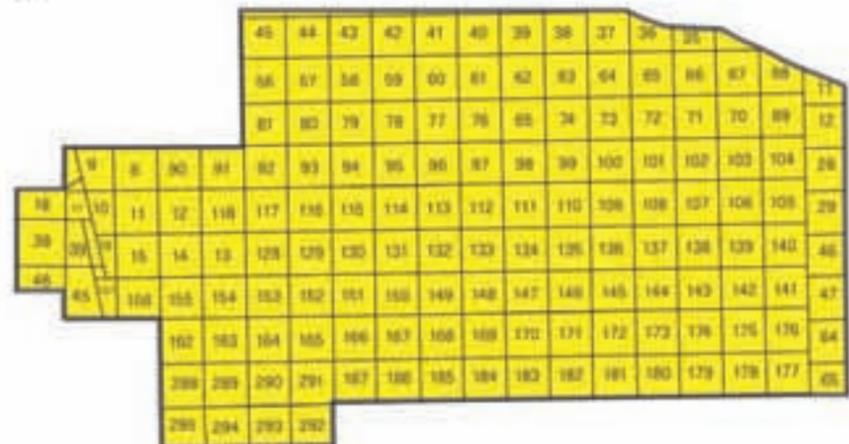
# Do you *Gulf*?



## West Cameron

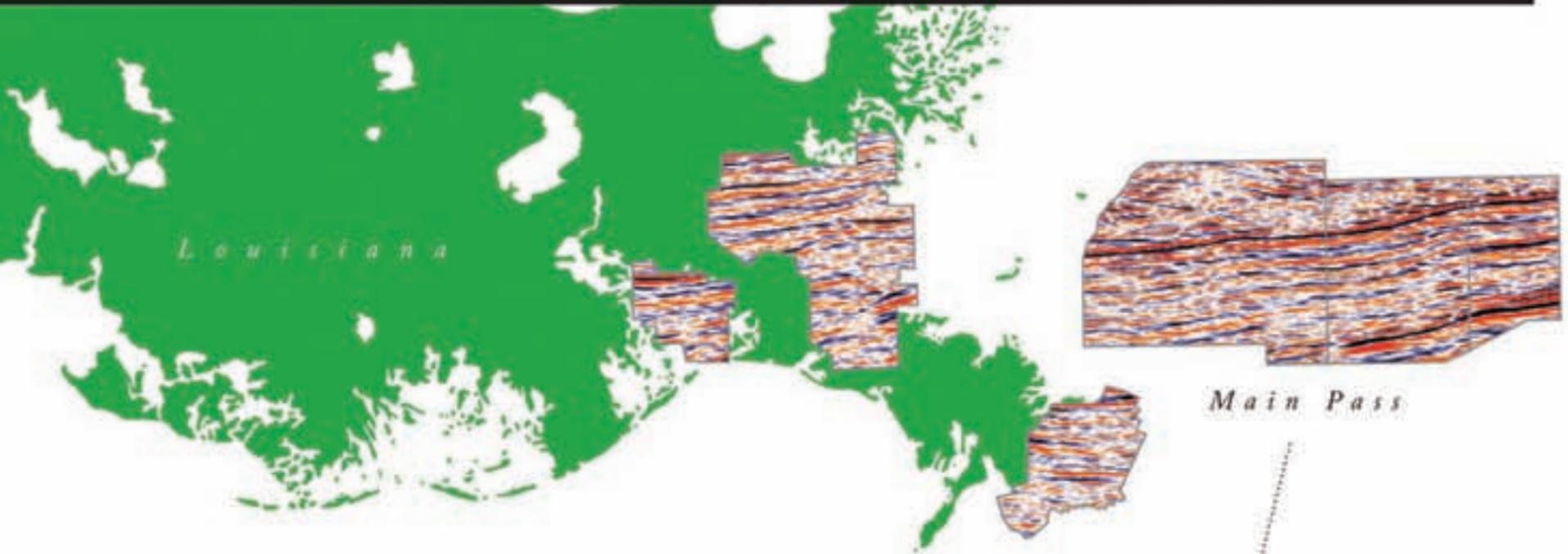
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Acquisition Direction	East - West
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Record Length	13 seconds
Maximum Offset	9,000 meters
Nominal Fold	120
Processed Bin Size	25 x 20 meters
Migration	Kirchhoff PrSTM



*We do.* Our brand new coverage of the Gulf includes state-of-the-art long offset seismic data — with *anisotropic* migration processing in West Cameron.

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**Main Pass**

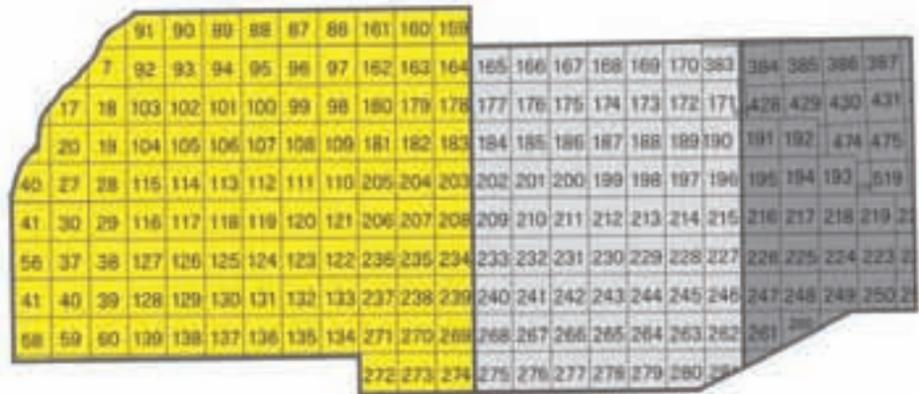
Gain new understanding of this under-explored area. Our ongoing acquisition effort covers 168 blocks, with 105 blocks completed. The final product of the initial phase (MP4) will be available by August for *Central GoM Lease Sale* (October 2007).

Acquisition Direction	North - South
Geometry	Inline Swath
Record Length	13 seconds
Maximum Offset	9,000 meters
Nominal Fold	120
Processed Bin Size	25 x 20 meters
Migration	Kirchhoff PrSTM

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## New Dates Announced for Athens 2007

New meeting dates have been announced for the European Region Energy Conference and Exhibition set this year for Athens, Greece – the first joint venture between AAPG and the AAPG European Region.

The meeting now will be held Nov. 18-21.

Athens 2007 is being created on the theme "Challenge Our Myths," and the meeting and exhibition will be held in the beautiful, white marble Megaron International Conference Centre in the heart of Athens.

Technical program highlights will include:

✓ A session on "Untraditional Theories and Ideas in Global and Large Scale Geology," which will examine the basis for the concept of subduction zones.

✓ Updates on recent exploration and production within key petroleum regions in the Mediterranean, North Africa, Middle East, Caspian, Black Sea, Russia, North Sea, Norwegian Sea and the Barents Sea.

✓ Updates on carbonate and clastic reservoirs, structural

geology, heavy oil, unconventional resources and resource estimation.

✓ A look at the energy supply and demand picture.

Greece's multi-dimensional history and culture also will provide the setting for a number of social activities, including:

✓ Visits to classical and historical locations in and around Athens – including Acropolis and Agora – as well as sites away from Athens including Cape Sounion and Delphi.

✓ Visits to archaeological and Byzantium museums, as well as art galleries such as the National Gallery and Vorres Gallery.

✓ Visits to high-tech locations at the Hellenic Centre, planetarium and Olympic Complex Centre.

✓ Day trips and excursions to nearby islands of Aigina and Spetses.

✓ Trips to vineyards and wineries in Attica.

For more information on Athens 2007 go to the AAPG Web site at [www.aapg.org/athens](http://www.aapg.org/athens). □

## President

from page 3

they do something worse – they do nothing.

Trying to get results in a volunteer setting is like pushing a rope or herding cats; it can be done, but you need a lot of patience and technique. Results are not necessarily directly proportional to amount of effort or quantities of demands. The other volunteers must believe in the goals of the group and want to work for the leader.

Thus, if you can be an effective leader in a volunteer setting, many of those skills and mindset will transfer to the professional world.

□ **Sense of duty.** Many of us have been helped in our academic, professional or personal pursuits. Volunteering is an opportunity to "give back" to our communities or profession.

It reminds me of the movie "Pay It Forward," in which a young boy writes a term paper on how to improve the world. His idea is to help three people, and in return those people must perform an equal or greater favor to someone else. He thinks his idea is a failure, because he sees little change in the people he helped. But away from his observations, his idea starts a remarkable chain reaction, which makes the movie interesting.

So it is with volunteer efforts at times. It is our chance to "Pay it Forward."

\* \* \*

Some of my best training to be a volunteer leader occurred in coaching youth sports teams. The following principles can be transferred from Little League all the way to president of AAPG:

✓ Listen to your players – if they say they have to go to the bathroom, let them go. You cannot make them do something they do not want to do.

✓ Make sure you and the team has the same goals – some teams do not want to win the championship, they just want to have fun. And goals successfully reached make for a successful season.

✓ Make it fun for the whole team – people and players have lots of choices on how to spend their time. If you cannot make it fun, they will find something better to do.

I encourage all AAPG members to actively volunteer your time, talent and treasure. The rewards will outweigh and outlast your efforts.

\* \* \*

By the time you read this, the annual convention in Long Beach will be history. Some fantastic volunteer leaders sacrificed untold hours of their personal time, including Dalton Lockman, chairman; Kay Pitts, vice-chair; Jon Schwalback Jr., technical program chair; Larry Knauer, sponsorship chair; and the entire organizing committee.

All of AAPG owes a sincere "thank you" to the Pacific Section volunteers.

'Til next month,



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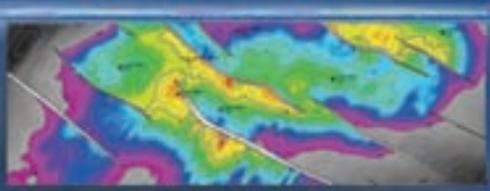
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## Retirements Creating a 'Changing of the Guard'

# Geologists' Salaries Jump Again

Salaries for petroleum geologists took another jump in 2006-07 with a weighted average increase of 9.1 percent overall in pay, according to the annual AAPG Salary Survey.

The 2005-06 year's salary survey showed an overall 16 percent salary increases.

The survey, conducted annually since 1981 by Mike Ayling of MLA Resources in Tulsa, showed the 15-19-year experience category charting the largest increase, with an 18 percent raise in salaries.

Entry-level geologists showed a 9.5 percent increase, with the 3-5 year category geologists' pay rising 13 percent. The 20-24 and 25-year-plus experience categories also recorded double-digit increases, with 10.3 and 10.5 percent hikes respectively.

The 10-14-year experience category charted a loss of 2.5 percent in recorded salaries – but Ayling noted the anomaly of this group was due to a lack of adequate data points, as it always has been for this group as it matriculates through the career cycle.

It is this same age category that recorded little entry-level hiring during a downturn in the industry in the early-mid 1990s.

Ayling found that 2006 "showed fits and starts in hiring activity, somewhat driven by the rapid build and then decline in oil prices, which in some cases led to caution on the part of employers."

2006 Geological Salary Survey			
YEARS EXPERIENCE	HIGH	AVERAGE	LOW
0-2	\$ 90,000	\$ 82,200	\$ 75,000
3-5	96,000	89,600	83,000
6-9	145,000	98,500	72,000
10-14	175,000	111,500	90,000
15-19	180,000	141,000	95,000
20-24	260,000	155,000	106,500
25+	208,000	149,900	109,000

The weighted weekly average oil price in 2006 began at \$53.28, peaked at \$69.52 in August and ended the year at \$50.42.

#### Changing of the Guard?

The survey is based on employed, salaried geoscientists and is based on salaries alone. It does not include bonuses, employee benefits, autos or other perquisites.

It does not attempt to include anyone whose compensation is in the form of consulting fees, retainers or overrides.

The purpose of the survey is to

provide a yardstick for those interested in assessing their compensation, and Ayling strongly feels that compensation is often a secondary consideration when evaluating overall job satisfaction.

The survey also is based on U.S. salaries, considered the "gold standard" for the industry. The measurement for international salaries for explorationists is virtually on a country-by-country, case-by-case basis, Ayling said, which makes statistical averaging non-productive beyond the boundaries of the specific country.

Ayling added that many ex-pats are paid U.S.-based salaries, while the

national oil companies opt to pay compatriots on a different, lower scale.

Ayling also sees a "changing of the guard" occurring.

"The geoscientists that were the youngsters in the mid '70s growth spurt are now reaching retirement (not early retirement) age," he said. "I was chatting with one recently (who has an incredible record as an oil finder) and he tells me that at 64, he's ready to do something else. He is fortunate to have made a good deal over the years, and can now take the time to pursue other interests."

"This does not bode well for our industry."

Meanwhile, Ayling said many geologists in the 20-year category have benefited from the lack of experienced geoscientists.

"Individuals with whom I spoke two years ago have seen their salaries jump from the mid-\$120's to over \$165,000 – for staff level positions. At some point, however, merely paying higher dollars isn't going to attract talent in sufficient numbers."

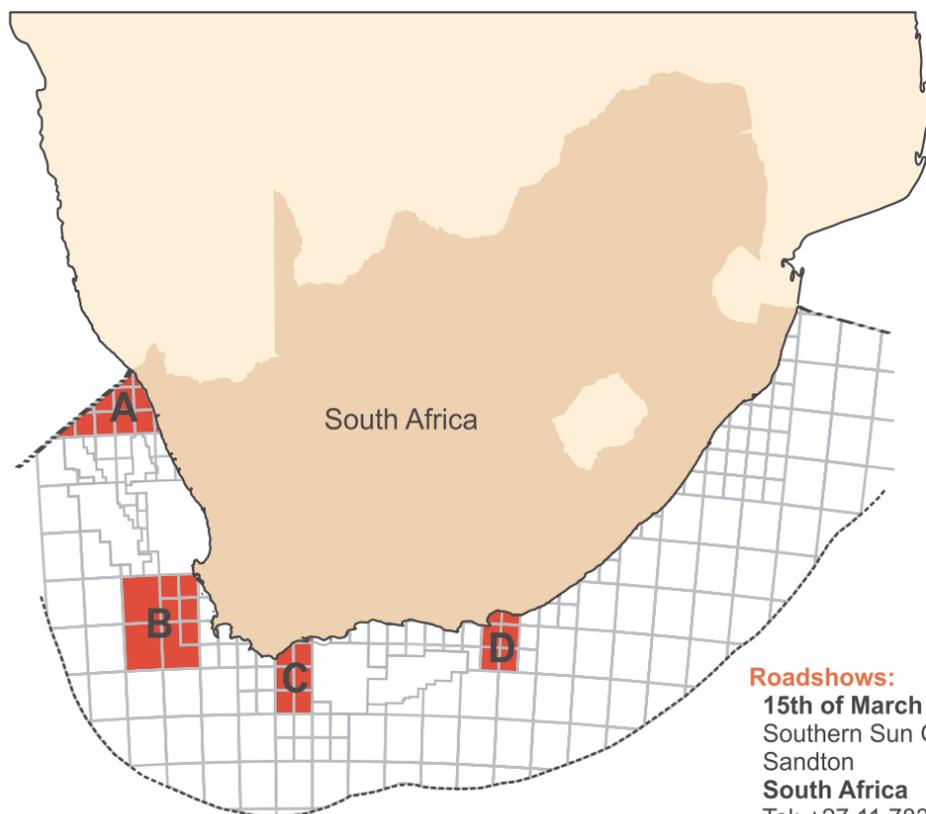
Thus, he noted, job satisfaction becomes a priority for an already-employed explorationist.

While the 2006 numbers again came in strong, Ayling said that he is "concerned about what 2007 has to offer."

"There are rumors of layoffs to be

continued on next page

## Unlocking South Africa's Offshore Potential



The Petroleum Agency, on behalf of the Government of the Republic of South Africa, is proud to announce the launch of South Africa's 2007 Offshore Licence Round.

Acreeage on offer will include:

- A - Shallow water northern Orange Basin
- B - Deep water and shelf, southern Orange Basin
- C - Proximal Bredasdorp Basin
- D - Offshore Algoa Basin

Access to full details of the Licence Round, downloadable maps and the roadshow itinerary are available at:

[www.cggveritas.com](http://www.cggveritas.com)  
[www.petroleumagencyrsa.com](http://www.petroleumagencyrsa.com)

Contact e-mails:  
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[lr2007@petroleumagencyrsa.com](mailto:lr2007@petroleumagencyrsa.com)

#### Roadshows:

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UK  
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**29th of March**  
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Republic of South Africa  
2007 Licence Round



YEARS EXPER	Historical Averages							
	1999	2000	AVERAGE SALARY			2004	2005	2006
0-2	\$53,600	\$59,700	\$ 64,000	\$ 65,000	\$ 65,600	\$ 67,800	\$ 74,400	\$ 82,200
3-5	61,400	66,000	67,500	71,200	67,700	75,600	81,300	93,400
6-9	78,400	74,200	74,500	78,300	75,700	78,800	95,400	98,500
10-14	83,400	89,400	95,000	96,600	91,900	107,500	114,400	111,500
15-19	94,900	100,600	99,400	102,500	102,500	116,000	119,600	141,000
20-24	107,700	111,700	111,600	113,900	118,100	112,800	139,000	155,000
25+	104,400	117,300	124,000	126,900	125,100	128,300	134,100	149,900

YEARS EXPERIENCE	Average Salary by Degree		
	B.S.	M.S.	Ph.D.
0-2	\$ 76,500	\$ 83,300	\$ 90,000
3-5	83,000	88,400	93,400
6-9	90,000	99,700	98,500
10-14	105,000	113,400	111,500
15-19	115,000	156,800	141,000
20-24	141,000	148,600	155,000
25+	145,300	148,200	168,000

continued from previous page

associated with several large industry mergers," he said. "On the other hand, with a rig count that has doubled since 2003 and grown by close to 20 percent over the past year, activity has continued to stay strong."

The apparent contradiction of layoffs in the face of increased activity is created by mergers and acquisitions and rumors of such that also cloud the hiring climate in the minds of some managements.

"Individuals with whom I speak," Ayling observed, "tell me more often that they are looking for a company with a clear purpose in mind, where they feel their contribution is truly valued." □



## DEG Announces Officer Candidates

AAPG's Division of Environmental Geosciences has announced its officer candidates for 2007.

The winner of president-elect will serve as DEG president in 2008-09. The vice president term is for one year, and the secretary-treasurer term is for two years.

The candidates are:

### President-Elect

- Rebecca Dodge, University of West Georgia, Carrollton, Ga.
- Stephen M. Testa, State of California Mining and Geology Board, Mokelumne Hill, Calif.

### Vice President

- Nancy S. Dorsey, U.S. Environmental Protection Agency, Dallas.
- Hannes E. Leetaru, Illinois State Geological Survey, Urbana, Ill.

### Secretary-Treasurer

- Nancy J. (Anne) Fix, Battelle-Pacific Northwest National Laboratory, Richland, Wash.
- Barbara D. Houghton, California Environmental Department, Bakersfield, Calif.

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*From Sea to Shining Sea*

# If It's Shale, It's Probably in Play

By DAVID BROWN

*EXPLORER Correspondent*

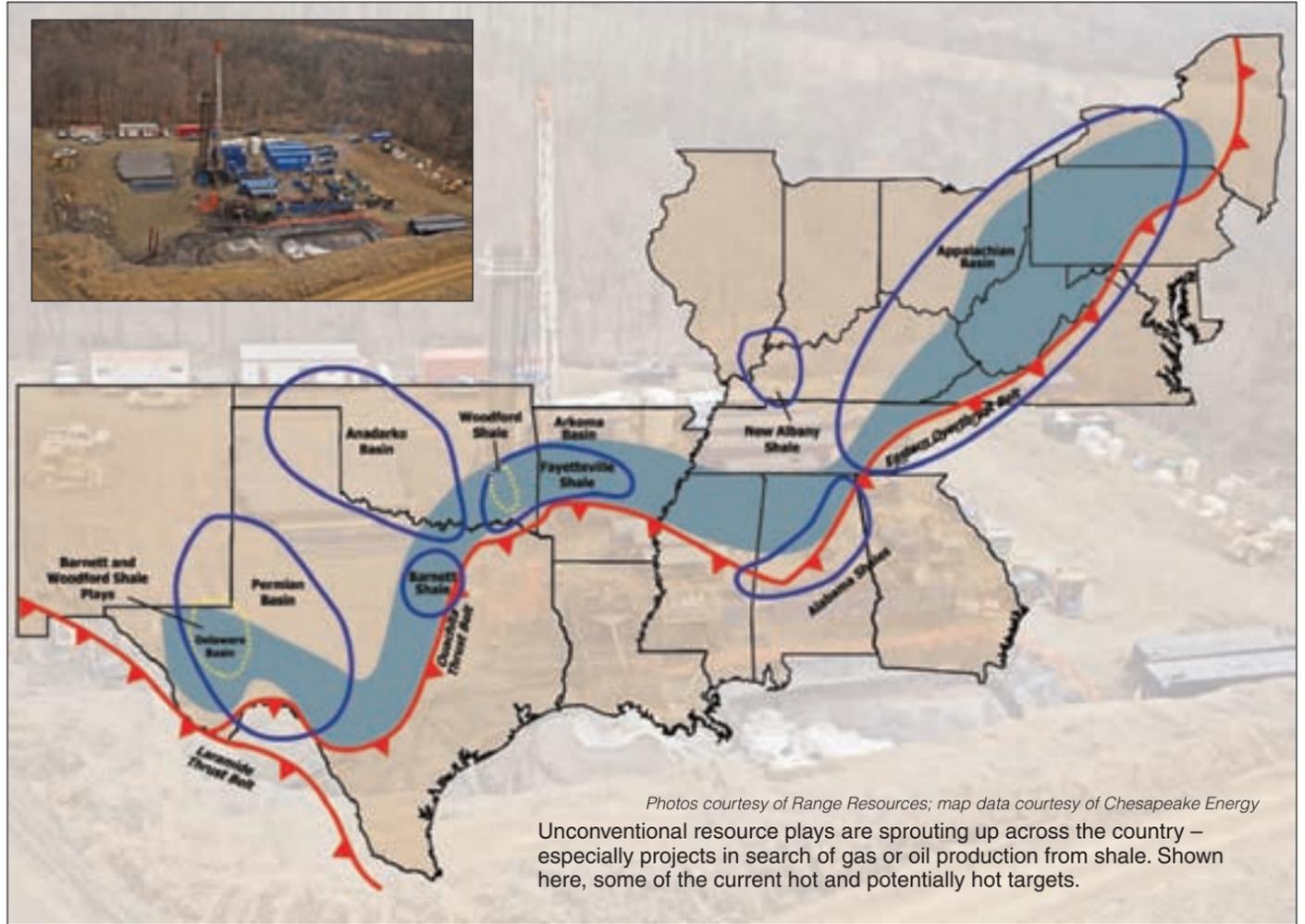
You can't accuse the U.S. oil and gas industry of conventional thinking.

Unconventional resource plays are sprouting up across the country, especially projects in search of gas or oil production from shale.

To track these new shale plays, you have to look beyond the Barnett shale in the Fort Worth Basin and farther than the Fayetteville in the Arkoma Basin.

Prospects include:

- ✓ The Devonian shale in the Appalachian Basin.
- ✓ The Mowry shale in the Powder River Basin.
- ✓ The Mancos shale in the Uinta Basin.
- ✓ The Woodford shale in the Ardmore Basin.
- ✓ A Floyd/Neal shale play in the Black Warrior Basin.
- ✓ The Barnett shale in the Permian Basin.
- ✓ The New Albany shale in the Illinois Basin.
- ✓ The Pearsall shale in the Maverick Basin.
- ✓ The Chattanooga shale in Arkansas and Tennessee.
- ✓ The Hovenweep shale in the Paradox Basin.
- ✓ The Bend shale in the Palo Duro Basin.



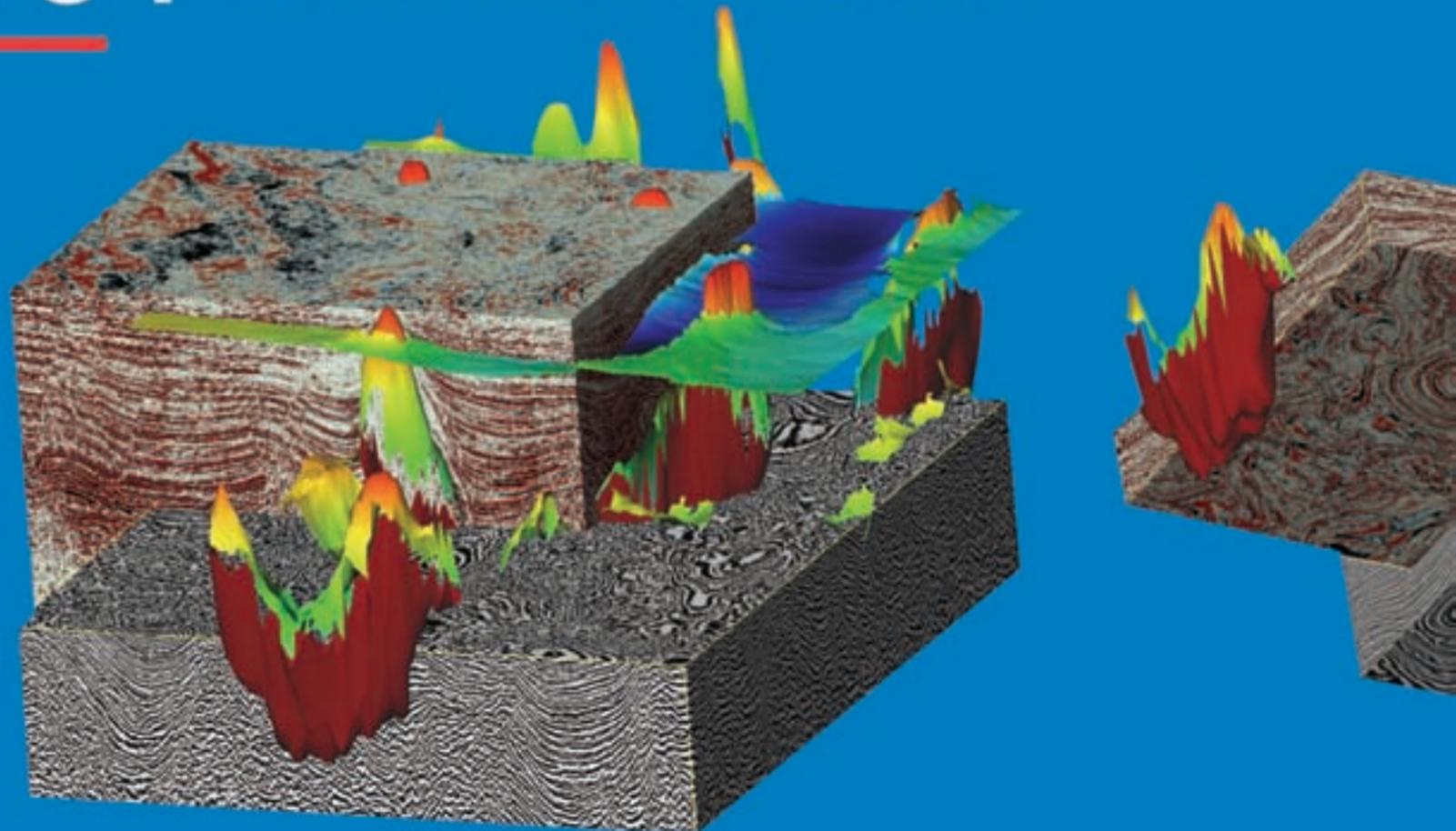
*Photos courtesy of Range Resources; map data courtesy of Chesapeake Energy*

Unconventional resource plays are sprouting up across the country – especially projects in search of gas or oil production from shale. Shown here, some of the current hot and potentially hot targets.

continued on next page

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continued from previous page

- ✓ A Barnett/Woodford shale play in the Delaware Basin.
- ✓ Another Barnett/Woodford shale play in the Marfa Basin.
- ✓ Other, largely untested targets like the Hermosa/Gothic shale in the Paradox Basin, the Baxter shale in the Vermillion Basin and, possibly ...

The shale in your back yard, if you have some.

**'A Lot of Promise'**

The deepest thinking exploration involves several upcoming and projected new wells with total depths of 12,000 feet or more, all assessing horizontal well prospects for shale gas.

One significant new shale play targets the oldest producing petroleum system in the United States.

The Devonian Shale-Middle and Upper Paleozoic system in the Appalachian Basin contains a technically recoverable 31.4 trillion cubic feet of gas, 562 million barrels of gas liquids and 7.5 million barrels of oil (mean estimate), according to a U.S. Geological Survey estimate by Robert Milici and Christopher Swezey.

The Big Sandy field in eastern Kentucky was identified as a major Appalachian gas reservoir in the late 1800s. It has produced from Devonian shale since 1921, with expected ultimate recovery of more than 3 Tcf.

"I think the area's got a lot of promise to it," Milici said. "The Big Sandy gas field has been known as a good producer for a long time.

"It's just a matter of figuring out how to get the hydrocarbons out of the rest of the area," he added.

The USGS assessment noted that Col. Edwin Drake discovered this petroleum system in August 1859 with the nation's first commercial oil well, which TDED at 69.5 feet.

Range Resources Corp. of Fort Worth holds 410,000 lease acres in an emerging Appalachian-Devonian black shale gas play in Pennsylvania.

"Really, the Appalachian Basin is where the roots of the company started. We've been there for a long time," said Jeff Ventura, Range Resources chief operating officer.

Ventura said the company holds a total of 2.3 million gross, 1.9 million net acres in the basin as well as 400,000 royalty acres.

By the end of 2006, Range Resources had 12 vertical and one horizontal wells online in the Devonian shale play.

"Our initial effort was to drill three vertical wells and just pump the big slickwater fracs down them. We've also done a lot of reservoir modeling there," Ventura said.

"Results from the initial wells indicate an estimated resource potential of between 0.6 to 1 Bcf per vertical well," he said.

Ventura estimated Range Resources' net unrisks reserve potential in the play at up to 2.5-5 Tcf. Plans call for drilling 60 additional vertical and eight horizontal wells in 2007.

**Geologically Defined**

A financial sweetener for Devonian shale gas is its proximity to major markets. Ventura said the company gets a 35-cent/Mcf premium to NYMEX for its Appalachian production, compared to a discount of as much as \$1.50/Mcf in the

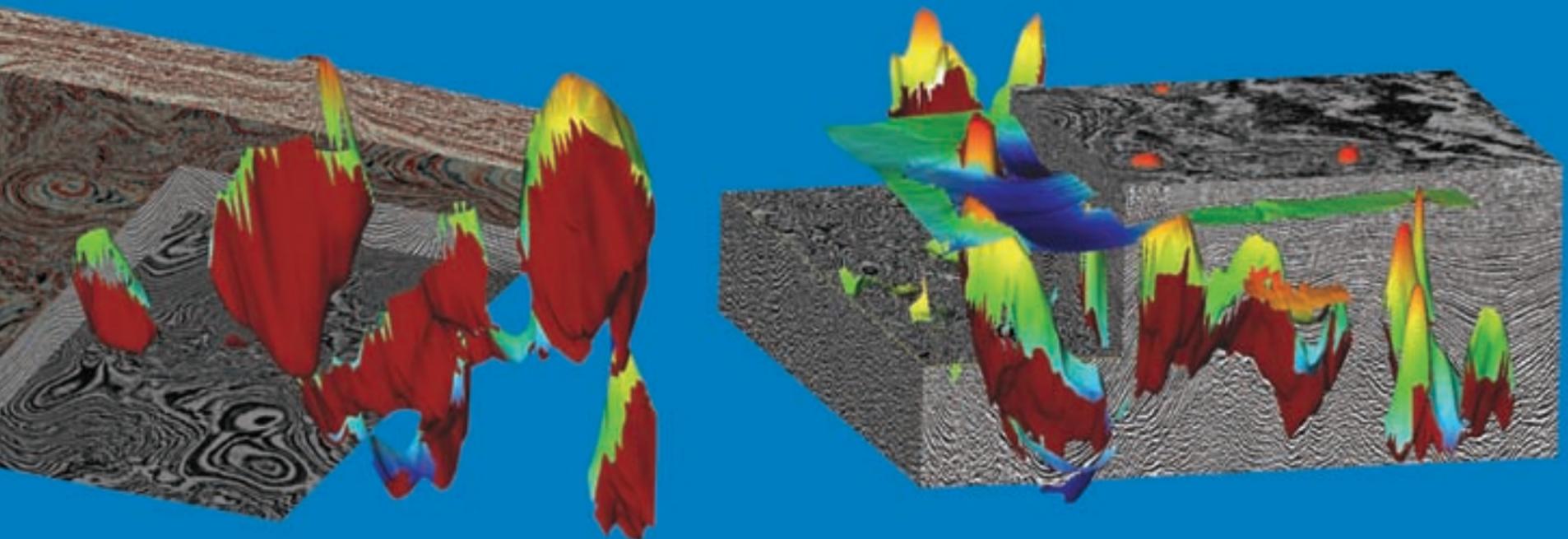
See **Shale Plays**, page 14



An aerial view of a frac job at one of Range Resources Devonian shale plays in Pennsylvania – these are among the first large, slick water fracs applied to shales in the Appalachian Basin.

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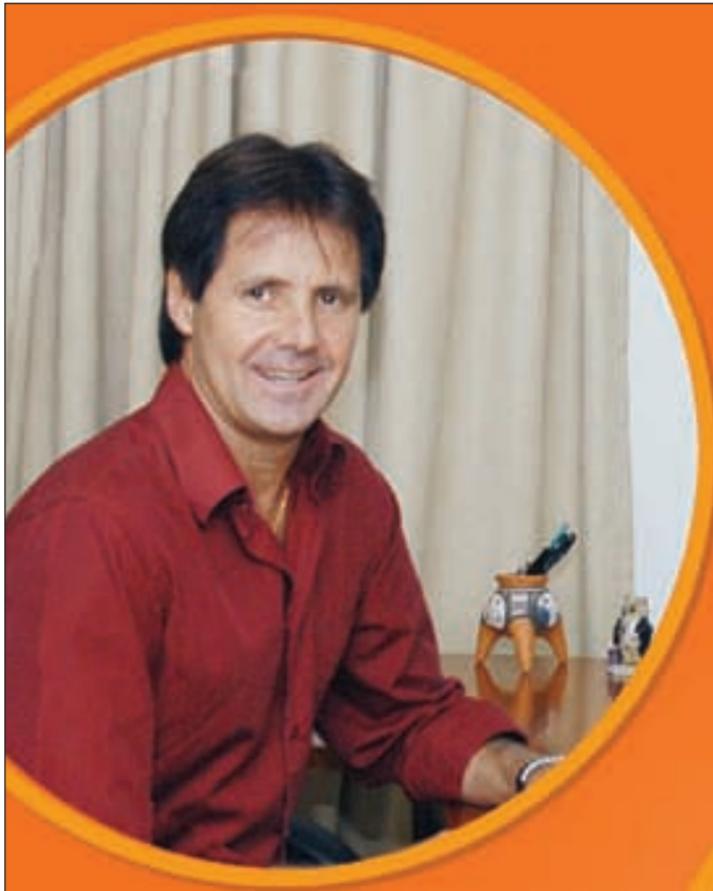
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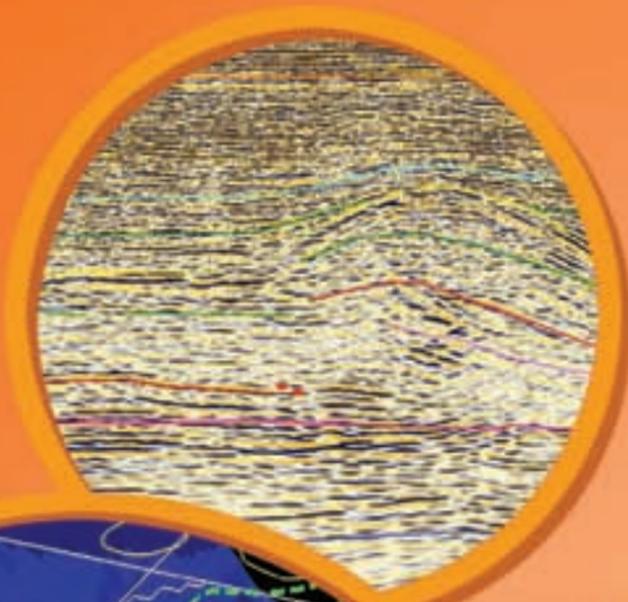
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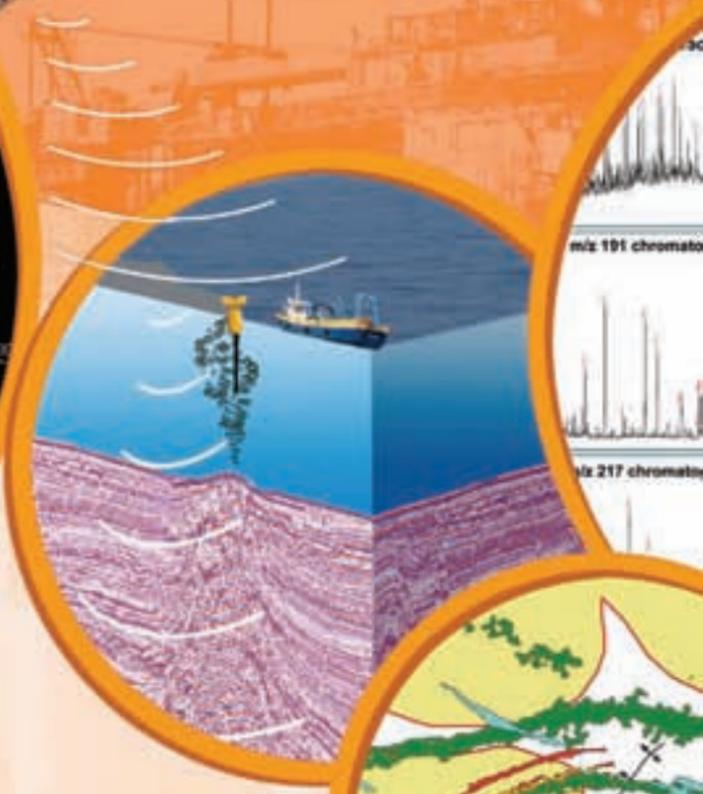
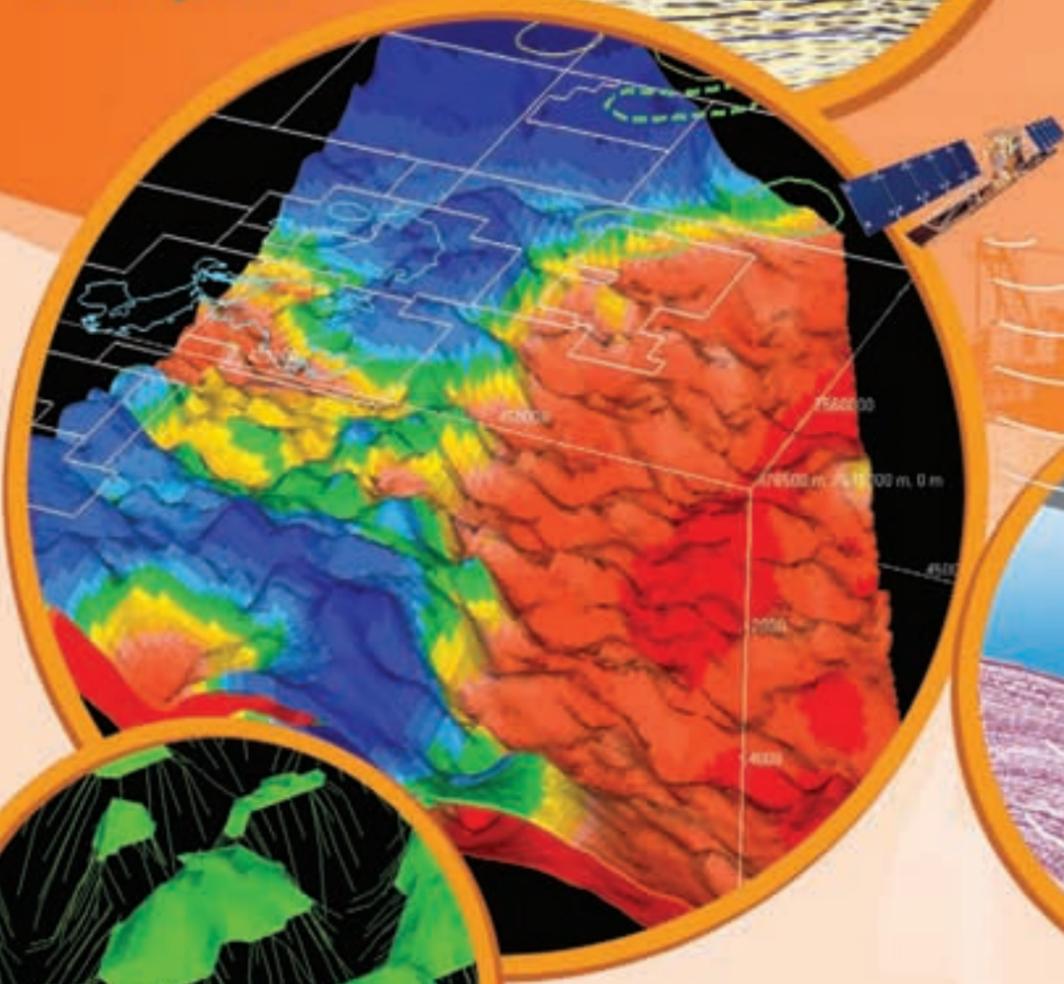
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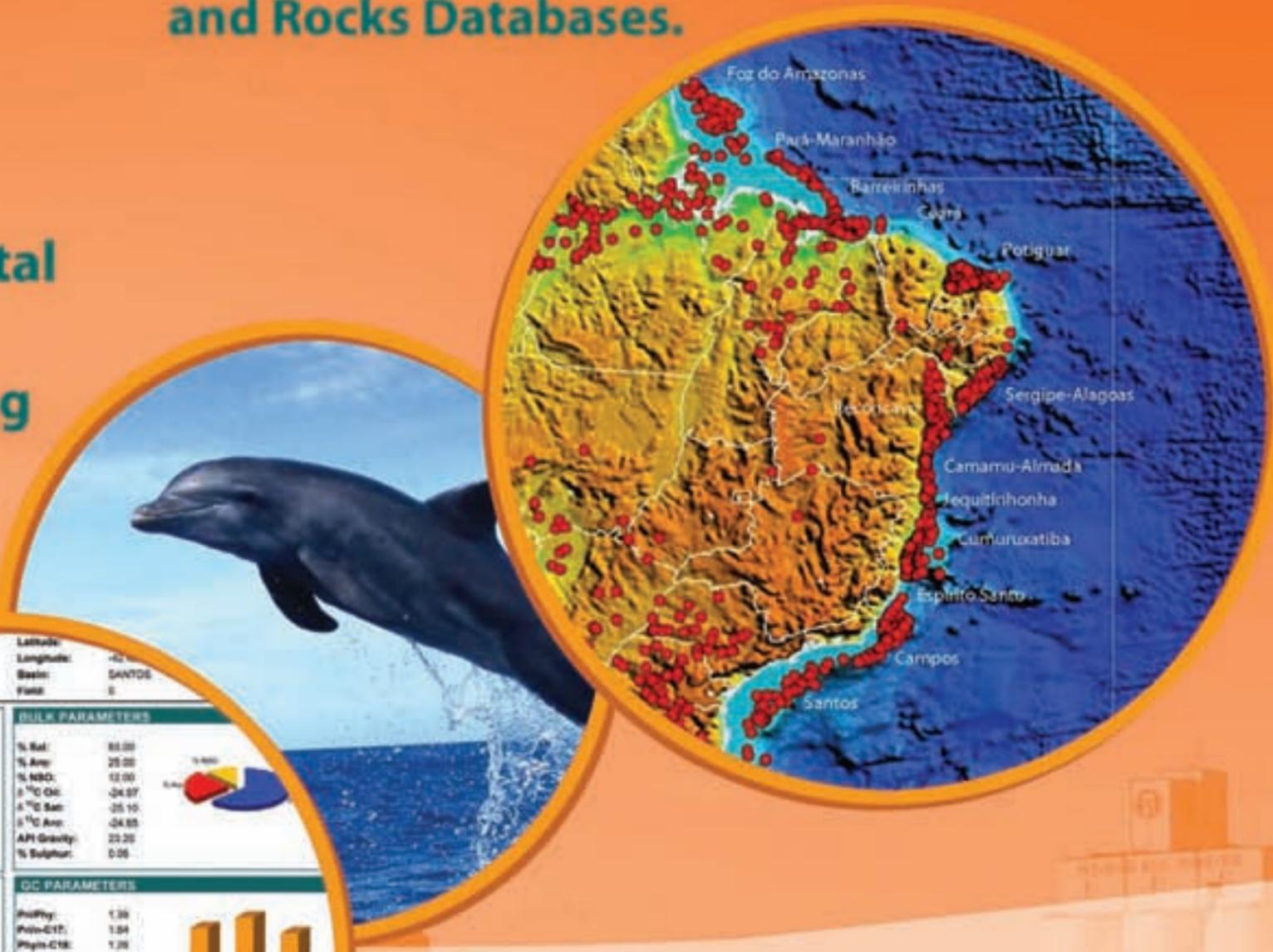


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% Aro:	25.00
% NSO:	12.00
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5 °C Sol:	-25.10
5 °C Aro:	-24.85
API Gravity:	23.20
% Sulphur:	0.06

GC PARAMETERS	
Phy-C1:	1.30
Phy-C12:	1.54
Phy-C16:	1.20
OP-1:	0.98
(C15+C17):	0.93

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## Shale Plays

from page 10

Rockies.

According to Milici and Swezey, the Appalachian Devonian strata can be divided into two groups:

✓ Pre-orogenic lower and middle Devonian strata dominated by stable shelf sedimentary deposits.

✓ Syn- to post-orogenic middle Devonian to early Mississippian strata that resulted from tectonism, subsidence and filling of a foreland basin.

The middle-Devonian Marcellus and Millboro shales, black shales at the base of the Catskill delta, extend widely and probably were deposited in relatively deep water as the basin first developed, they said.

A number of upper-Devonian gas shales alternate with units that contain less organic material. They cite Dennison (1985), who notes that middle-Devonian sea-level transgressions generally resulted in deposition of limestone, while cyclical upper-Devonian flooding events resulted in deposition of black shale.

Milici said the overall basin is considered underpressured.

"When you get a major decollement, like you do below the Pine Mountain fault, what the drillers found out years ago – they would go in there with cable tools – is that you have a major blowout zone," he said.

"The areas of limited decollement in fault-prone Devonian shale are good producers, and that's why Big Sandy works, I think," he added.

Ventura said the northern part of the Devonian shale play area is slightly geopressed, while the southern part is

*The deepest thinking exploration involves several upcoming and projected new wells with total depths of 12,000 feet or more, all assessing horizontal well prospects for shale gas.*

underpressured and naturally fractured.

"In the northern part of the basin, from the West Virginia-Pennsylvania border north, there's a lot of gas in place but you don't have that natural fracturing, so the stimulation methods of utilizing nitroglycerin or newer foam fracing don't work," he noted.

Conversely, slickwater fracing isn't optimal in the southern area because of the low pressure, he said.

Range Resources considers the Appalachian Devonian black shale a key play area where it intends to be an

industry leader, according to Ventura.

The company recently opened a Pittsburgh office to oversee work there.

### Playing the Permian

The company also is involved in an emerging Barnett shale play in another long-time producing area, the Permian Basin, where it holds 20,000 acres with estimated reserve potential of 400-500 Bcf.

That play offers attractive secondary opportunities in other formations,

primarily the Woodford, Fusselman and Wolfcamp, Ventura said.

"Because the Barnett in the Permian is clearly a different beast, we've chosen to focus on other areas. I think our strategy of being followers out there has been successful," he said.

The company does operate in the Fort Worth Barnett – "We've just drilled some killer wells in Tarrant County," Ventura said – and has plans to expand the eastern limits of the play into Ellis County.

"We recently brought online a well that's producing at 12 million cubic feet equivalent per day, the highest well rate in the Fort Worth Basin Barnett shale to date," he said.

Ventura said Range Resources hopes to become a leader in the major Barnett play area, as well.

"We've got a lot of people in our company now who helped unlock the Barnett for the industry," Ventura explained.

"The big challenge to me always comes down to people," he said. "Do you have the technological competence – the people – to extract the resources economically?"

### Powder River Activity

A USGS assessment update issued last year estimated the mean undiscovered hydrocarbon resource in the Powder River Basin at 16.6 Tcf of gas, 639 million barrels of oil and 131 million barrels of natural gas liquids.

A Powder River Mowry play is one of the few new shale plays primarily producing oil.

Brigham Exploration, Abraxas Petroleum and American Exploration are all involved in the Mowry shale play,

See **Potential**, page 16

## 'Bama Boasts New Shale Play

The new shale play most people have never heard of?

That probably would be the middle Cambrian Conasauga gas play in St. Clair and Etowah counties in northeastern Alabama.

Out of four initial test wells drilled by Dominion Black Warrior Basin Inc., the best flowed at 233 million cubic feet per day after stimulation and improved results are expected.

Alabama's State Oil and Gas Board recently approved the company's

request to establish the Big Canoe Creek shale gas field and expand its drilling units to 320 acres from 40 acres.

According to the Geological Survey of Alabama, the play is in the Valley and Ridge Province of Alabama with highly folded and faulted rock units.

The Conasauga can be several thousand feet thick in the area as a result of stacking of folded strata, the agency said.

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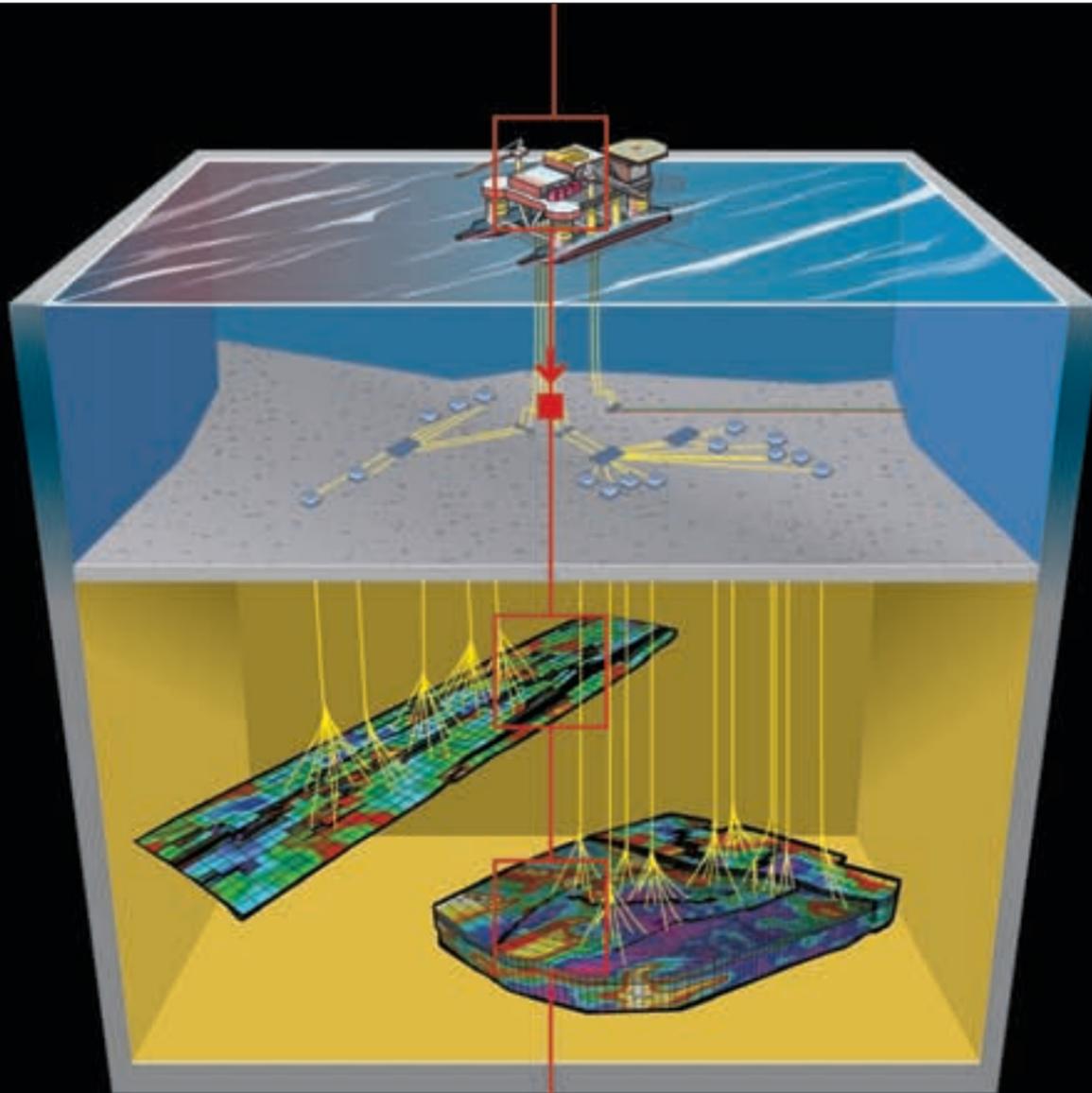


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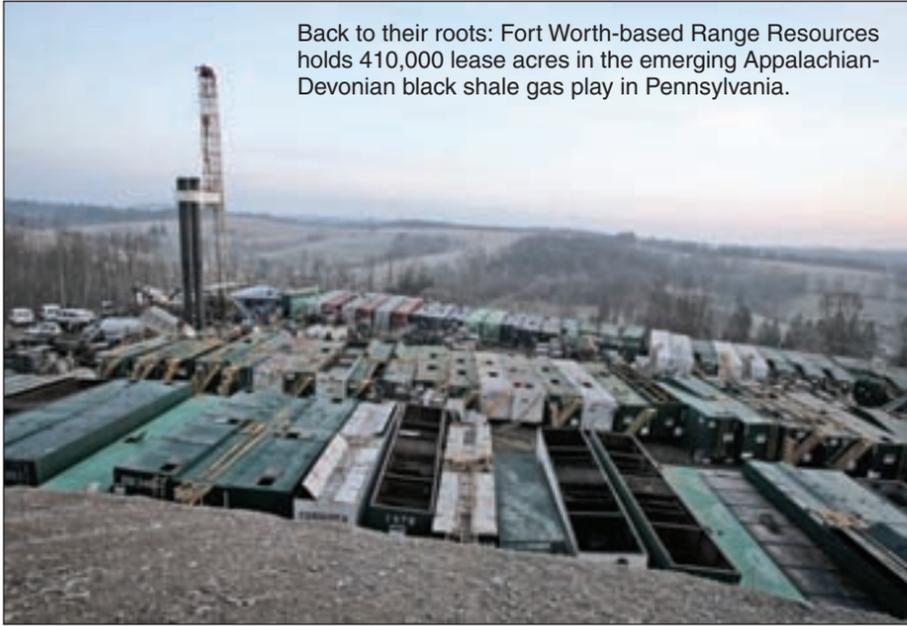
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Back to their roots: Fort Worth-based Range Resources holds 410,000 lease acres in the emerging Appalachian-Devonian black shale gas play in Pennsylvania.



## Potential from page 14

centered in Converse and Niobrara counties, Wyoming.

By March, Brigham had drilled 18 vertical wells and two pilot horizontal wells in the play. Its first well flowed 120-160 barrels of oil per day from an outer, uncased section of the well bore and 50-90 barrels per day from 1,381 feet of cased bore after stimulation.

Abraxas said the lower Cretaceous Mowry is a siliceous silty shale up to 175 feet thick at 7,500-10,000 feet. It estimated ultimate recovery comparable to the Bakken (MBOE) and a drill-frac cost of about \$3 million per well.

### 'Off and Running' in Utah

Another new play has unfolded in the

very thick Mancos shale group in Utah's Uinta Basin, said Steve Schamel of GeoX Consulting in Salt Lake City.

"It's off and running – this is a resource that's now established. There are quite a few wells that will soon become part of the public record," he said.

Schamel said he has identified five Cretaceous units in Utah with shale gas potential, four of them members of the Mancos.

These units were deposited in a basinward position within the Western Interior Seaway, foredeep basin to the Sevier thrustbelt, according to Schamel.

Deposition in proximity to heavily vegetated, fluvial-deltaic shorelines resulted in a high humic component of organic matter in the basinal shales, he said.

Operators in the basin already have drilled the Mancos play area for higher production, Schamel noted.

"They're currently producing from sands above the Mancos and now they're drilling into the Mancos," he said. "So the indications are very good that we will have substantial gas shale production in the future."

### Something Old, Something New

Newfield Exploration Co. has broken open a Woodford shale play in the western Arkoma Basin, where it plans to spud 150 wells in 2007.

Now a new Woodford play is quickly developing south of that production in Oklahoma's Carter, Love, Marshall and Bryan counties in the Ardmore Basin.

Bankers Petroleum Ltd. of Calgary has announced that its first well in the Ardmore Woodford flowed 470 Mcf and six barrels of condensate per day with 25 percent of the frac fluid still unrecovered.

The company estimated original gas in place at 222 Bcf per section based on a Schlumberger gas shale log analysis.

Ed Gallegos of Iron Sights Operating Inc. in Stillwater, Okla., said his company has 17,000 net acres in the play area. Others in the play include Range Resources, Wagner and Brown, Cimarex Energy, Chesapeake Energy, Walter Oil & Gas, Antero Resources and Oracle Resources.

Gallegos said drilling has encountered about 300 gross feet of Woodford pay overlain by 60 feet of fractured Woodford.

"The total Woodford interval is 300 feet thick with the upper 60 feet being chert, then 120 feet of organic black shale, 100 feet of shale-chert laminations and 10 feet of green shale with a detrital interval on the bottom of the sequence," he said.

Porosities are in the 20-26 percent range as interpreted by density logs, and "in addition, you have all the tectonics in this area that have enhanced the natural fracturing," he said.

### Ordovician Highs

A 3-D seismic shoot is under way in the Cumberland Syncline extension area of the basin, according to Gallegos.

"That's going to uncover a lot of Ordovician highs that haven't been drilled," he noted.

Gallegos expects operators in the Ardmore Woodford play to move toward fractured horizontal wells soon, improving production rates.

"There are several vertical wells in the area with cumulative production of 2-5 Bcf," he said. "If horizontal drilling enhances the Woodford production here as it has in other areas, this should turn out to be the best shale production in the state." □

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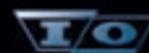


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## AAPG's Explorer of the Year

**Barnett at Core of Career**

By LOUISE S. DURHAM  
EXPLORER Correspondent

Dan Steward takes pride in doing a good job yet without calling attention to himself.

That's no small achievement.

It's difficult to be low-key when your peers consider you to be a crucial contributor to the commercial success of the kingpin of shale gas production in the entire United States.

It's difficult to be low-key when your peers have decided you're the AAPG Explorer of the Year.

Indeed, Steward's unwavering dedication during the almost two decades-long team endeavor at Mitchell Energy to penetrate the shroud of mystery that had long enveloped the Barnett Shale ultimately turned it into the crown jewel of shale plays.

That play was the big reason why Steward was cited as the Explorer of the Year at the recent AAPG Annual Convention in Long Beach, Calif.

"It was a team effort, and I was just a team member" the self-effacing Steward noted.

"We had a helluva good team, and when I was told about the award, friends told me it was important for someone at Mitchell to get recognized for the Barnett."

**'Gift from God'**

You might say it was Steward's destiny to be involved in a high-profile oil patch success story.

*Steward became the central hub of all Barnett activity in the company. As such, his responsibilities ran the gamut from the reservoir all the way to legal and regulatory affairs.*

He essentially grew up in the oil fields where he felt right at home as early as the tender age of three years when his dad was a tool pusher on a rig. Steward and his siblings often tagged along, nosing around the location – an educational (and entertaining) experience off limits to kids today.

Steward later had the opportunity to accompany his then-drilling superintendent dad into the field in western Kentucky. It was there that his love for the oilfield was supplemented by an interest in geology triggered by his acquaintance with a group of geologists who worked the area.

Following graduation from the University of Houston in 1972 with a bachelor's degree in geology, Steward embarked on a career that would include varying companies and varying assignments.

One of his early jobs entailed working as a mud engineer in Laurel, Miss. He credits this assignment with being a crucial step in his career, providing him

hands-on experience with drilling problems and the opportunity to observe the effects of geology on the drilling process.

Interaction with both engineering and operations personnel further enhanced his in-field education.

Mitchell Energy entered Steward's life when the company lured him away from Shell Oil after he served seven years with the major. When he joined Mitchell in 1981 as district geologist in the North Texas region, his professional life was set to take on a profound new twist.

"The next 21 years proved to be the most challenging of my career," Steward said. "Mitchell began its evaluation of the Barnett Shale in late 1981, and I am blessed to have been a part of the play essentially from inception to fruition.

"Over the years my positions and responsibilities changed," he said, "but the Barnett always made up a part of my duties."

See **Barnett**, page 20



Steward



Photo courtesy of Range Resources

Going strong: A Barnett Shale simul-frac site in north Texas.

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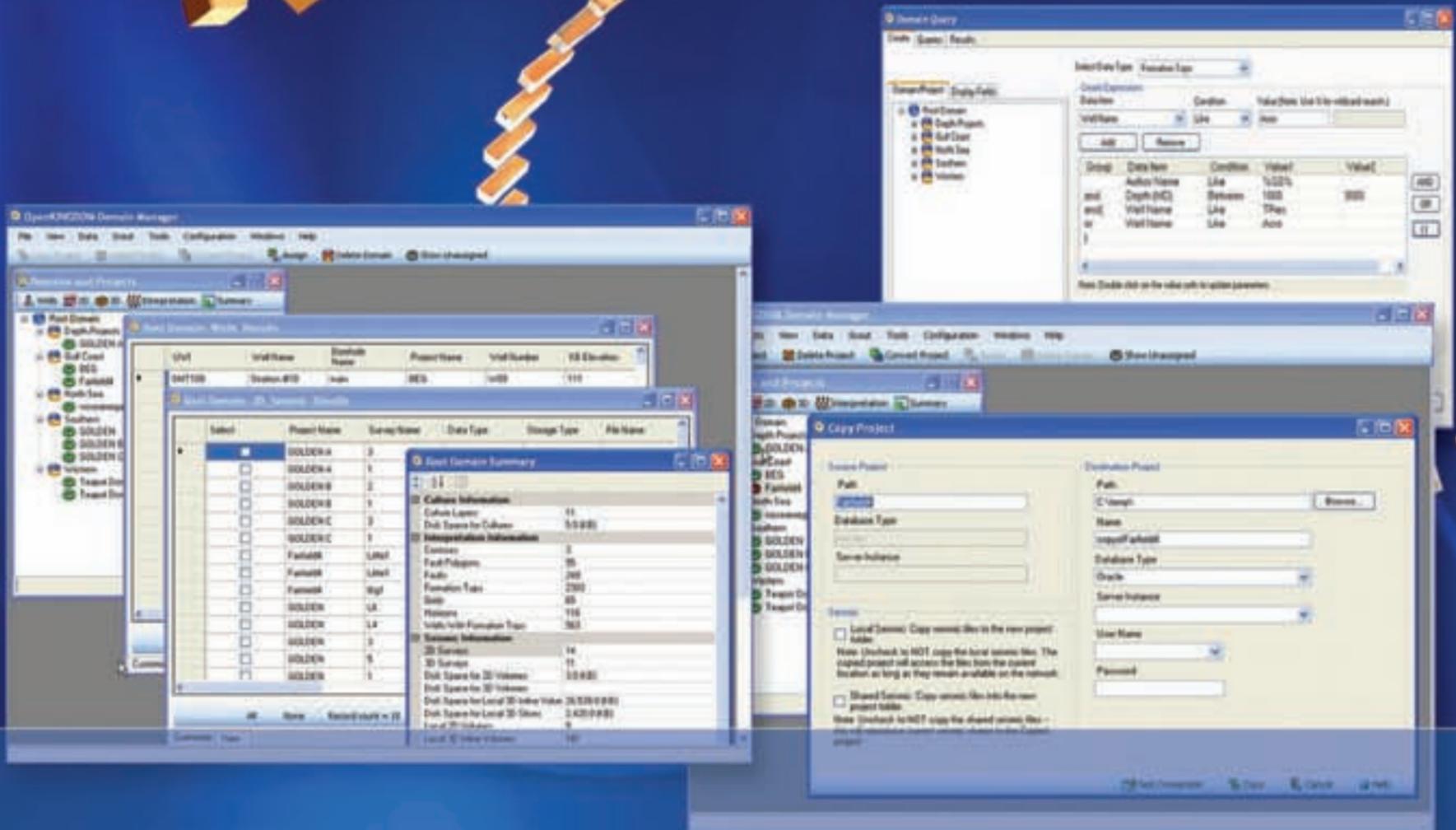
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**Barnett**

from page 18

Kent Bowker, one of Steward's fellow geologists at Mitchell, noted that Steward became the central hub of all Barnett activity in the company. As such, his responsibilities ran the gamut from the reservoir all the way to legal and regulatory affairs.

"I consider the Barnett to be a gift from God," Steward said. "It became available just as the country was going through a gas crunch, and it had taken us 20 years to get it to that point."

**An Impact Player**

The ultimate "explosion" of production from the Barnett, after all the years of head-scratching over its resistance to

*"I consider the Barnett to be a gift from God. It became available just as the country was going through a gas crunch, and it had taken us 20 years to get it to that point."*

giving up commercial quantities of gas, is due in large part to a couple of particularly noteworthy events – and Steward played a key role in each.

Mitchell's practice of using gel fracs was both expensive and relatively inefficient; at best, the wells were break-even. The decision was made to try more economical water and/or sand fracs, and Steward helped to gain management approval for the initial experiments.

"We applied water fracs to areas where we were break-even," he said, "and they became extremely profitable. This was not

just because they cut costs, but through the use of water fracs, we were able to determine other things we were doing wrong and other ideas we had wrong – the water fracs gave us a cheap way to test non-commercial or break-even areas."

The second especially noteworthy event occurred when the Mitchell team realized its gas-in-place numbers were way small.

In 1997, information got out that Chevron had come up with three times more gas for its well in Johnson County.

"We said either we're in the wrong county or our numbers are wrong," Steward said. "We then got permission to try state-of-the-art technology, which at that time included gas recovery from cores."

The coring program included both conventional and pressure cores. The effort determined that in the area where the first gas-in-place evaluation had been made, the numbers were off by two-thirds. In turn, this meant the recovery percentages were far less than thought, and the company began an extensive program of re-fracs and down-spacing and added the previously uneconomic upper Barnett zone to its vertical well completions.

When queried about the future of the Barnett play, Steward noted "there are a lot of things we're not even thinking about that will happen, but that's the beauty of a technology play – technology does not stand still."

**The Mother Lode**

One of the earlier major technology events in the play entailed horizontal drilling. In fact, Steward enthusiastically championed horizontals at Mitchell, where he participated in planning and drilling the wells.

Not surprisingly, Barnett operators have gotten creative with this technology, e.g., applying simultaneous frac jobs on parallel horizontals drilled as close as 500 feet.

A fraced interval is pressured up like a balloon, creating what's called a positive stress shadow, according to Steward. Each frac creates its own positive stress shadow, and the players think the frac networks are repelled by one another rather than finding each other.

"I believe the future of the Barnett and shale as a whole will involve tweaking the horizontals, tweaking the stimulation on the horizontals, getting a better understanding of fracture containment," Steward said.

"One of the things in the future is coming up with ways to prevent fracing out of a zone and tying into water in a horizontal well – or where that has happened, to compensate for it."

Dual gathering systems – high pressure and low pressure – are another possibility for the Barnett. When a well reaches a low producing pressure, it can be moved to that gathering system.

Aside from its considerable contribution to the domestic natural gas supply, the Barnett no doubt provided the impetus to kick off other shale gas plays in the nation.

"The understanding from the Barnett experience is spilling over to all these other shales," Steward noted. "It doesn't give all the answers to the other shales but enough understanding that we recognize their potential." □



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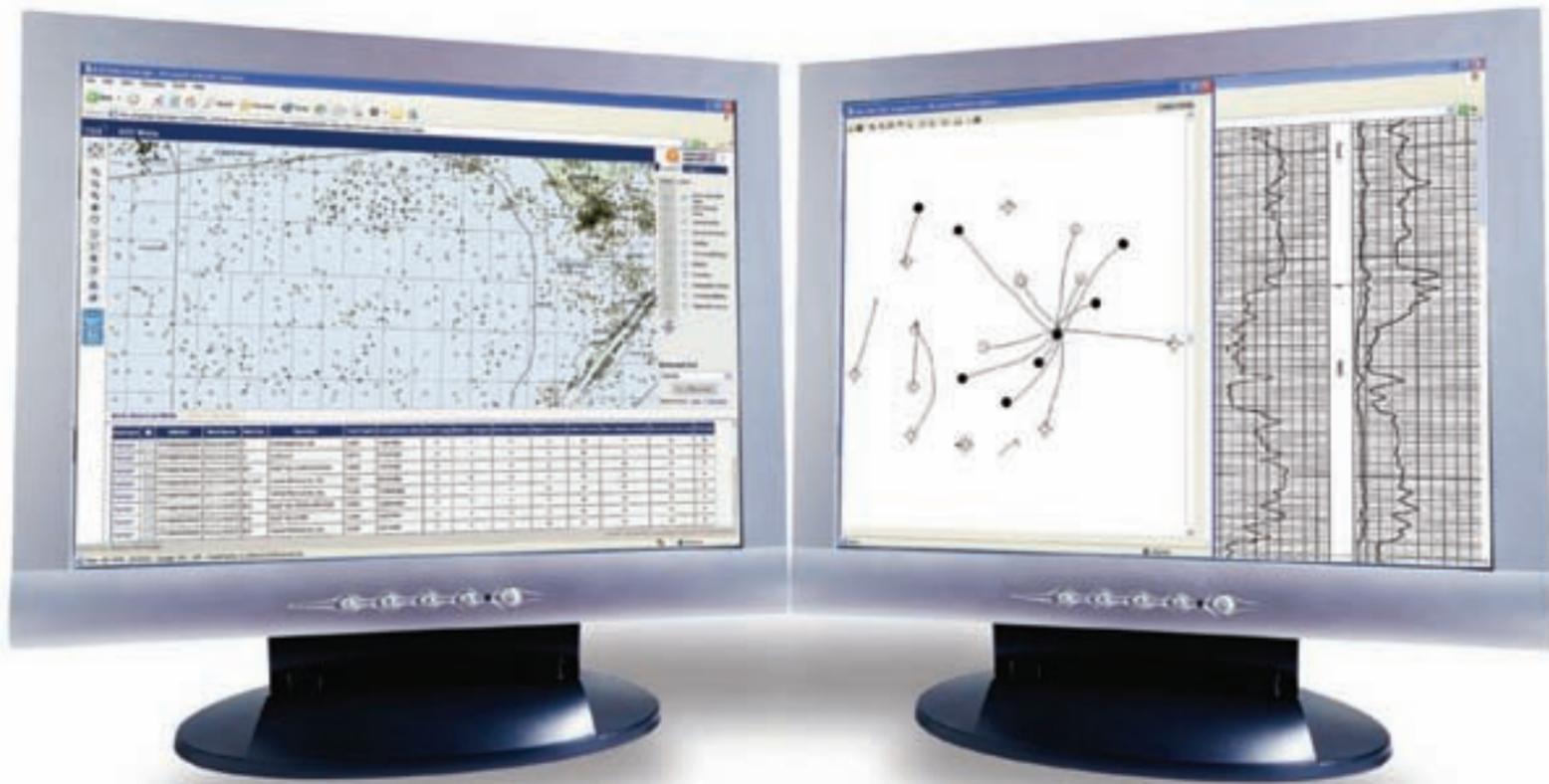


## Book to Tell Barnett Story

The Barnett Shale clearly is a fantastic story – and it's a story you can read about in detail very soon.

At the request of legendary oilman George Mitchell, who initially recognized the Barnett Shale as a sleeping giant, AAPG Explorer of the Year Dan Steward – who joined Republic Energy as a consultant following Devon's purchase of Mitchell Energy in 2001 – penned a history of the Barnett.

The book will be published by the Fort Worth and the North Texas geological societies.



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*Technology + Price = Giant Tight Gas Field***‘Goldilocks Rocks’ Pay Off for Vernon**

By LOUISE S. DURHAM  
*EXPLORER Correspondent*

A field that can be touted as an industry showpiece for what can be accomplished with the right technology in combo with the right commodity price sometimes attains its lofty status only after years of expensive trial and error – and frustration – on the part of the operators.

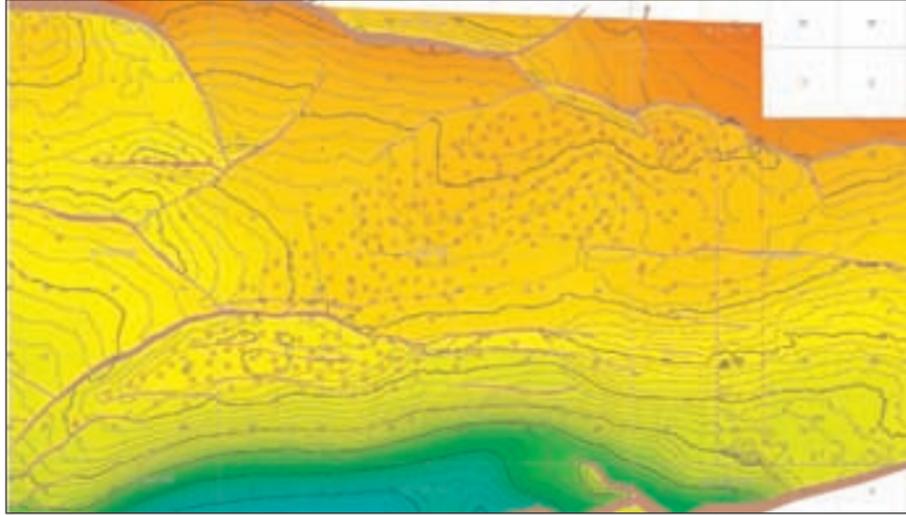
Vernon Field in north Louisiana is a prime example.

The field, which is located in Jackson Parish, was initially discovered in 1967 when a well drilled into pay in the Upper Cotton Valley Cadeville formation – the Cadeville is the first sand below the tight Knowles limestone, which is a regional top seal for the over-pressured Cotton Valley, according to Andrew Mehlhop, manager of G&G for the eastern Gulf Coast at Anadarko Petroleum, which has operated Vernon for the past six years.

It wasn't until 1980 that the vast potential of the Lower Cotton Valley sands in the field was recognized, when a non-commercial well drilled and tested the formation.

Even though close to 20 additional wells were drilled following this discovery, Vernon languished as a kind of ho-hum little tight gas field for almost two decades as a succession of owners tried unsuccessfully to turn it into a winner. Low commodity prices and lack of appropriate technology were prominent hindrances.

Anadarko's success in developing the Bossier Sand in the East Texas Basin



Graphics courtesy of Anadarko Petroleum

Present-day structure map of Vernon/Ansley field area in Louisiana, based on 3-D seismic, showing a structural picture of the nearly fully developed field.

tweaked the company's interest in evaluating Vernon, and it purchased the field in late 1999.

As a result of Anadarko's ensuing development activity, Vernon has expanded from 7,400 acres in 1999 to 25,000 HBP acres today, with more than 300 wells on 40-acre spacing.

Over 400 Bcf of gas have been produced, and estimated ultimate recoveries per well range from 1.43 Bcf up to 27 Bcf, according to Mehlhop, who noted the gas is sweet with no significant H<sub>2</sub>S or CO<sub>2</sub>.

Today, Vernon ranks as one of the nation's giant tight gas fields, boasting more than four Tcf of original-gas-in-place with estimated recoverable gas pegged at 1.8 Tcf. The field produces from the Lower Cotton Valley at depths of 12,000 to 15,000 feet along a growth-faulted anticlinal trap.

#### The Sweet Spot

In what smacks of an oil patch version of musical chairs, a new-old operator – EXCO – is in the process of

purchasing the field from Anadarko.

EXCO initially bought the field from Apache for \$28 million, Mehlhop noted. Anadarko later purchased the field from EXCO for \$40 million and is selling it back to EXCO today for \$1.6 billion.

This big ol' tight gas field is sourced by the Bossier shale, which actually is a prolific oil-prone source rock of unknown thickness locally in the Vernon area, according to Mehlhop.

"Original expulsion from our basin modeling studies shows there was probably peak oil expulsion in the Lower Cretaceous," he said. "There was a structure and a trap in place and a reservoir in the Lower Cotton Valley. Conditions were right to migrate the oil into that structural trap, and the implications are Vernon Field was likely a nice oil field during the Lower Cretaceous, with high porosity and permeability.

"Then another 100 million years of time went by, and the field was buried another 10,000 feet or more," Mehlhop said. "The temperature was hotter and all of that source rock went into the gas window, as well as all the oil previously generated and trapped in the field.

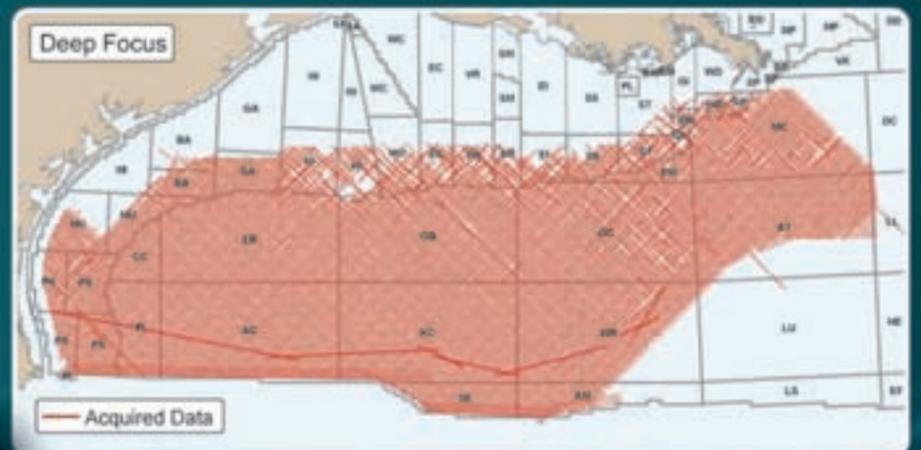
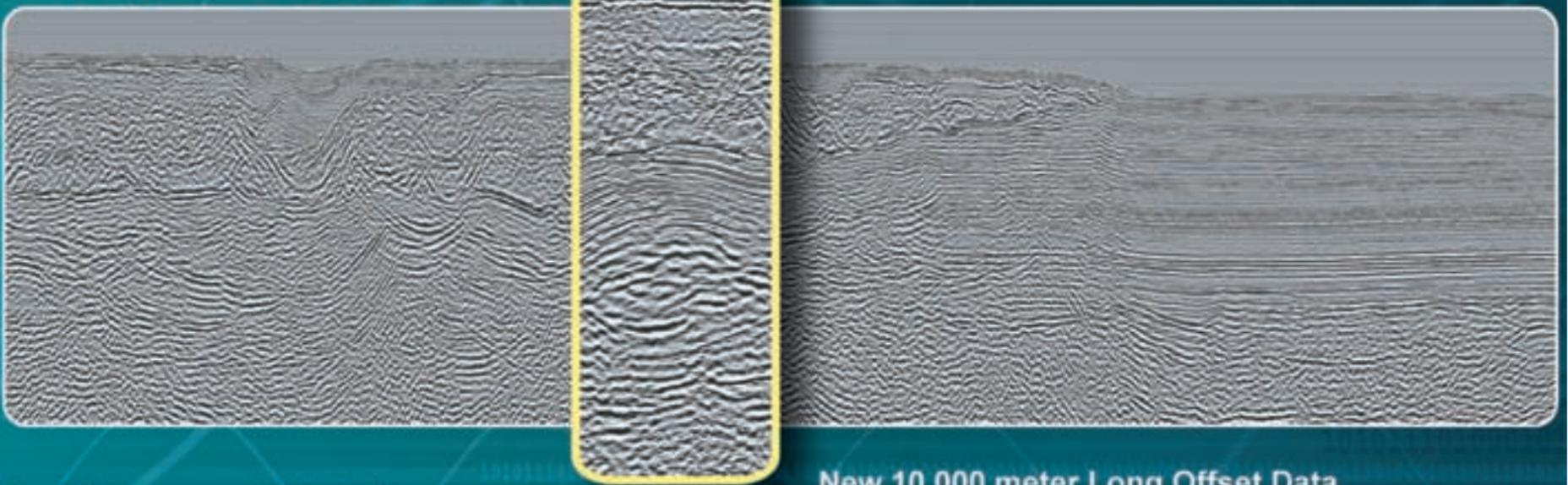
"That's why Vernon is a nice sweet spot in north Louisiana," he noted. "It probably retained hydrocarbons in the trap for a long time, which preserved the porosity when everything was getting compacted and buried and affected by water and diagenesis.

See **Vernon**, page 24

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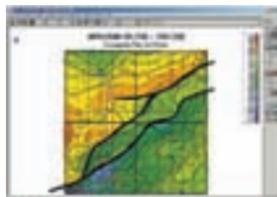
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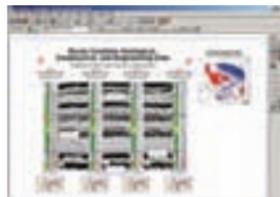
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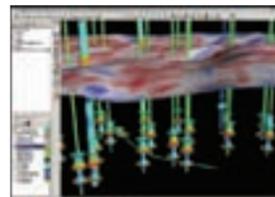
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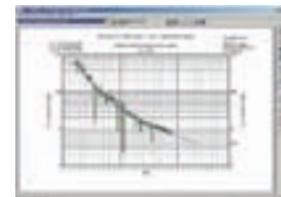
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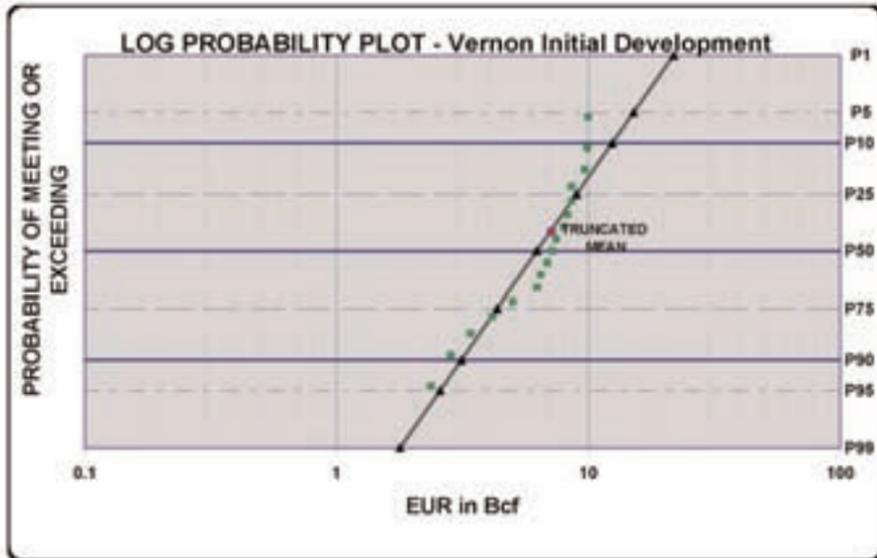
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A cumulative probability plot of the first 17 Lower Cotton Valley wells drilled in the Vernon field. EURs ranged from 2.3 to 9.9 Bcf/well, with a mean of 7.12 Bcf/well.

## Vernon

from page 22

"The sweet spot at Vernon was protected because it had oil in early that stayed there through its history until it cracked to gas," Mehlhop said. "Early oil emplacement preserves the porosity – average porosity today in the Lower Cotton Valley at Vernon is 7 percent, with streaks of 10-12 percent locally."

### Just Right

The field may be loaded with gas, but there are myriad factors that enter in to making a play like this work, according to Steve Blanke, exploration manager for the West Texas/Mid-Continent exploration team at Anadarko.

For instance, an understanding of clay content and type figure heavily in getting the gas; this knowledge is best acquired via thin sections of the rock.

"One of my colleagues coined the term 'Goldilocks rocks,'" Blanke said. "The amount of clay in the sand has to be just right.

"Too much clay and you get ductile deformation of the clays around the sand grains, and it won't fracture easily," he noted. "This also occludes porosity and permeability.

"Too little clay and you have very clean sands," Blanke said, "that because of the depth the sands were buried to, you get a lot of quartz overgrowth and destructive cementation that basically makes the rock unproduceable."

Blanke attributes the field-wide overpressure at Vernon to the long-ago conversion of oil to gas. The ensuing increased volume had no place to go, resulting in pressure build-up.

### Looking for 'Smoking Guns'

Advances in technology were key to unlocking the trove of natural gas at Vernon.

"High Pressure High Temperature (HPHT) drilling played a key role in this thing going gangbusters," Mehlhop said. "We couldn't have developed the field before the industry started breaking through with the right technologies for drilling and completing tight gas sands.

"Much of the challenge is temperature-related," Mehlhop added. "Most of the tools historically would fail above 300 degrees Fahrenheit."

He likened it to the perfect storm, where the technology and other requirements all came together, including advances in 3-D seismic data, which now covers the entire field and provided a highly improved structural and stratigraphic picture over the earlier 2-D seismic.

A return to respectable commodity prices following the downturn of the late '90s also figured heavily in the field's extensive development.

In fact, Mehlhop noted the field reached its peak production rate of 350 MMcfd at the end of 2004 and into 2005, when gas prices skyrocketed up to the \$14/mcf range at one point – another bit of serendipity.

So, you ask, why sell something that appears to be a cash cow?

It's strictly business, Mehlhop emphasized – just part of the process Anadarko is going through to pay down debt and fine-tune its focus following a couple of big acquisitions.

"We love the tight gas play, and Anadarko is full-blown in the play," Mehlhop said.

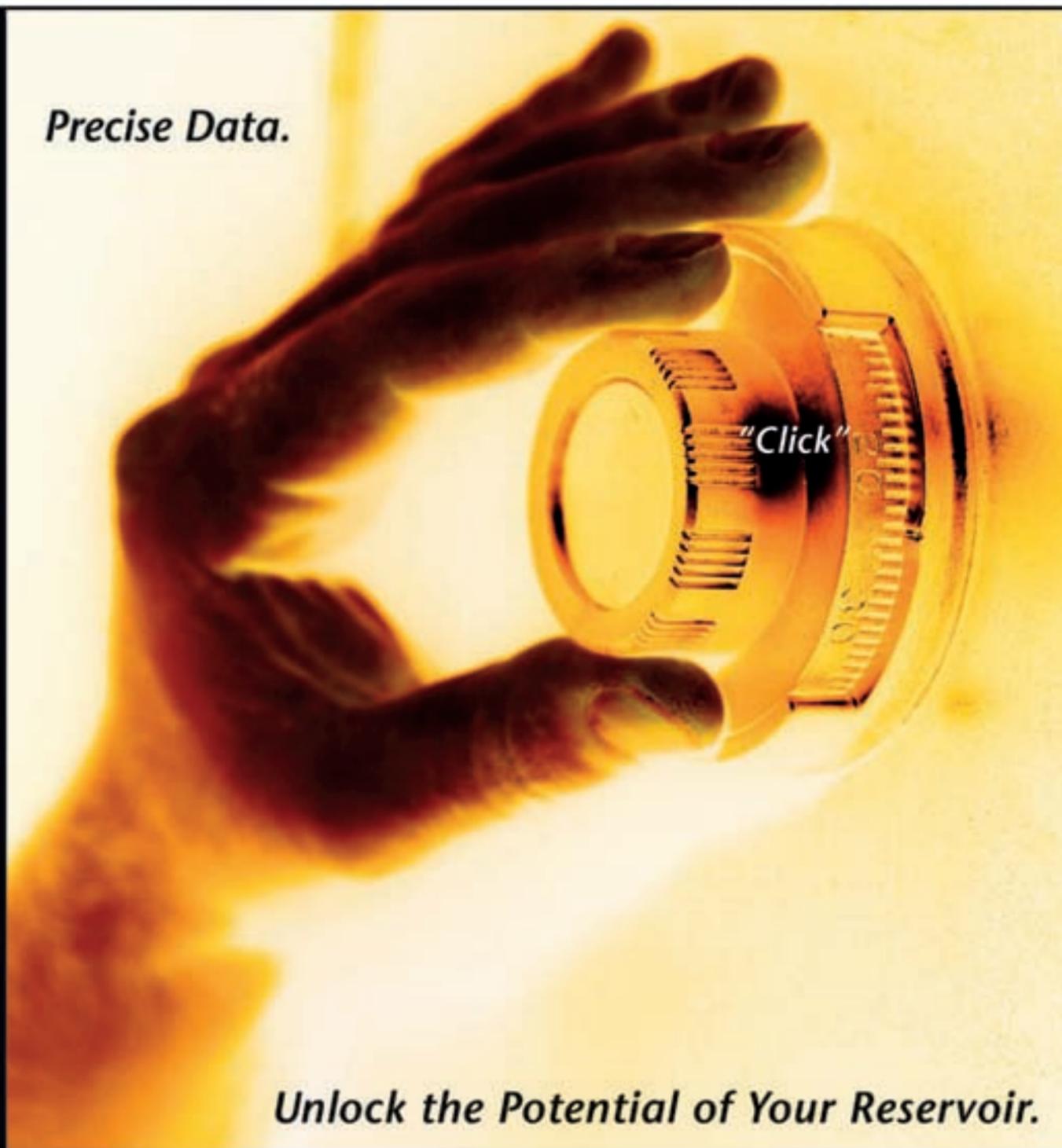
He noted Vernon is just one of many 'string-of-pearls,' similar-type fields the company has been discovering, including the East Texas Bossier Field prior to Vernon. The company believes the Lower Cotton Valley tight gas play extends eastward into Mississippi and is exploring in that direction.

Blanke noted there are fields and show wells scattered about this whole area.

"I call the old wells drilled in the late '70s and early '80s 'smoking guns,'" Blanke said. "There would be kind of an artificial end to a field's life because prices couldn't support the stimulation they had to do.

"We've seen more of these 'smoking guns' along trend into south Mississippi," he noted. "They're usually data sparse, maybe one well and older suites of logs and likely no core data." □

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## A Switch from What to Why

## Climate Modeling Gets Another Look

By KEN MILAM

EXPLORER Correspondent

Climate modeling in exploration is an idea whose time has come and gone – and may have come again, according to Eric J. Barron.

“Twenty to 25 years ago there was a lot of active interest in physics-based models of atmospheric and ocean movement,” Barron said.

Because ocean motion affects sedimentation, the hope was that simulations of upwelling might point to source rock origins.

Success at the time was “moderate,” said Barron, dean of the Jackson School of Geosciences at the University of Texas, Austin.

“Since then our ability to do simulations has exploded,” he said.

“We are seeing sufficient advances in how to look at specific time periods and basins ... at features a geologist would be interested in and at a scale to be more useful,” Barron said.

Barron, who last month was named to a special AAPG committee dealing with global climate issues, discussed these and other ideas in a paper titled “Is It Time for a Rebirth in the Geologic Applications of Climate Model?” at the recent AAPG Annual Convention in Long Beach, Calif.

Modeling pioneers had to make assumptions from limited data, he said.

“The grid spacing was quite coarse, so application was limited on basins,” he said. “Now, the spatial resolution is much greater.”

*“Since then our ability to do simulations has exploded. We are seeing sufficient advances in how to look at specific time periods and basins ... ”*

## The Great Debate

Models also play a major role in today's debate over global climate change, an issue in which AAPG obviously has a “keen interest,” he said.

“The geologic record is a window on how the earth can change,” he said.

Simulations also help show how sensitive the planet is, he said, and storms provide one example.

“In the past, we might have thought about how a storm would cross the early Atlantic ... but not look at the effect of hurricanes on shelf structures,” he said.

“Also, there's a difference in how we see how these storms function.

“Both are of interest ... in petroleum exploration and in the global warming discussion,” Barron said.

Just as the geologic record provides data for climate models, computer simulations can enhance understanding of geologic processes, he said.

“It helps us interpret the geologic

record better.”

For example, he said, in studying pollen from an extinct plant species modeling might help researchers determine why the species occurred where it did and why it disappeared.

“Looking at the geometry of the continents and the sun along with the fossil record, we may say, ‘Wow, that's arid conditions.’

“The simulation may show wet spots in winter and hot, dry summers – precipitation times,” he said.

## Two Tracks

In his paper, Barron said climate models have been applied to geological problems in two tracks:

✓ The first emphasizes explanations of climate changes to understand periods of warmth or glaciation. The research focuses on the forcing functions that govern past climates, incorporating key climate feedbacks and matching the suite of thermal indicators.

✓ The second track focuses on reconstructing environmental conditions during specific periods, using the geologic record as a key indicator of those conditions.

Both tracks are of interest in exploration and global warming research, he said.

“We were doing a lot of comparisons to geologic data. Barron said. “Then we started to switch to ‘why?’ and spent less time marrying the wealth of geologic data to the models.

“The second track has much more promise (in exploration) than before,” he added.

Modelers are adding a broader range of physical variables, he said.

“In the ‘80s, we really didn't do much with vegetation on the surface of the earth. We simply ‘painted,’ if you will, areas green,” he said. “Today the (modeled) vegetation begins to change with the simulations.”

While the core of researchers pursuing these areas today are in academia, the finer scale at which simulations can model climate-related geologic changes holds renewed promise for the petroleum industry, he said.

Noting that his paper for the annual meeting was an invited talk, Barron said “I believe they sense there are some added approaches here.” □

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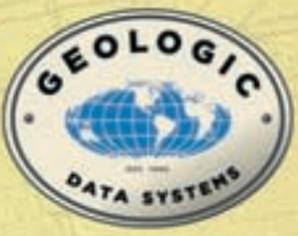
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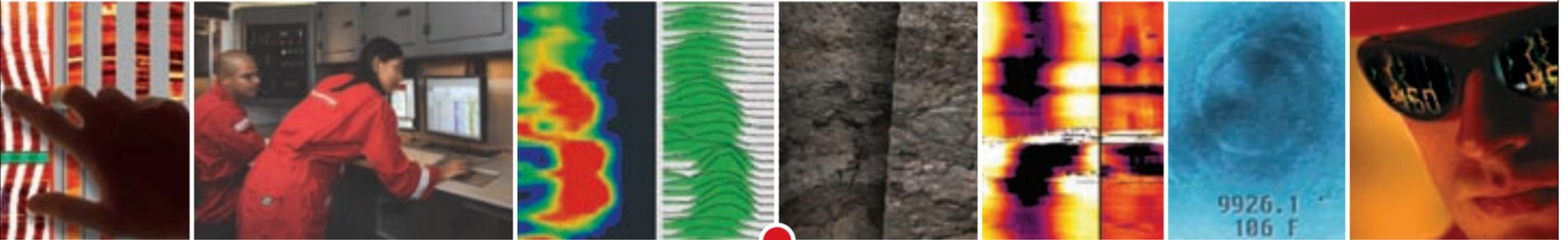
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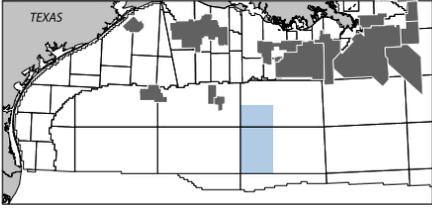
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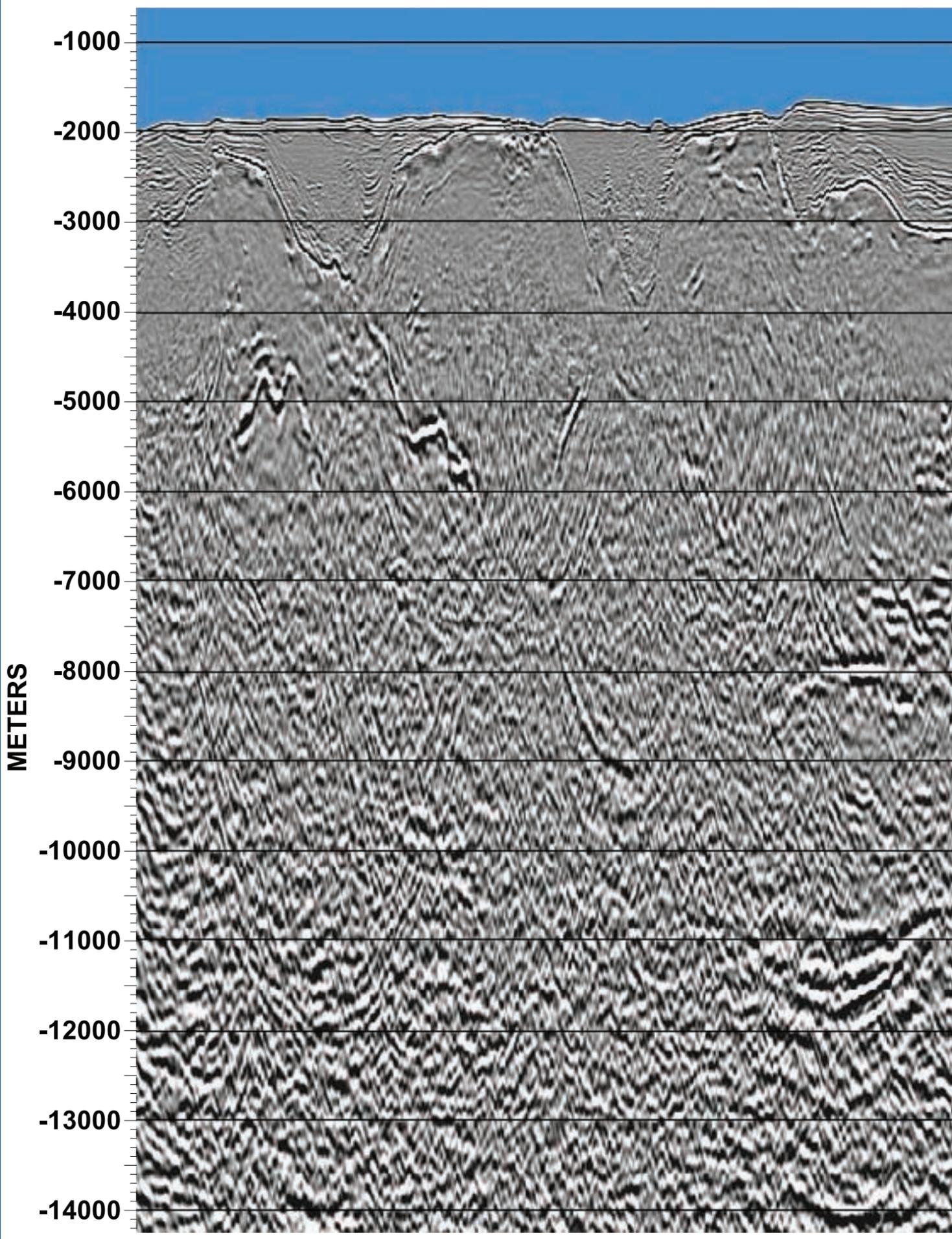
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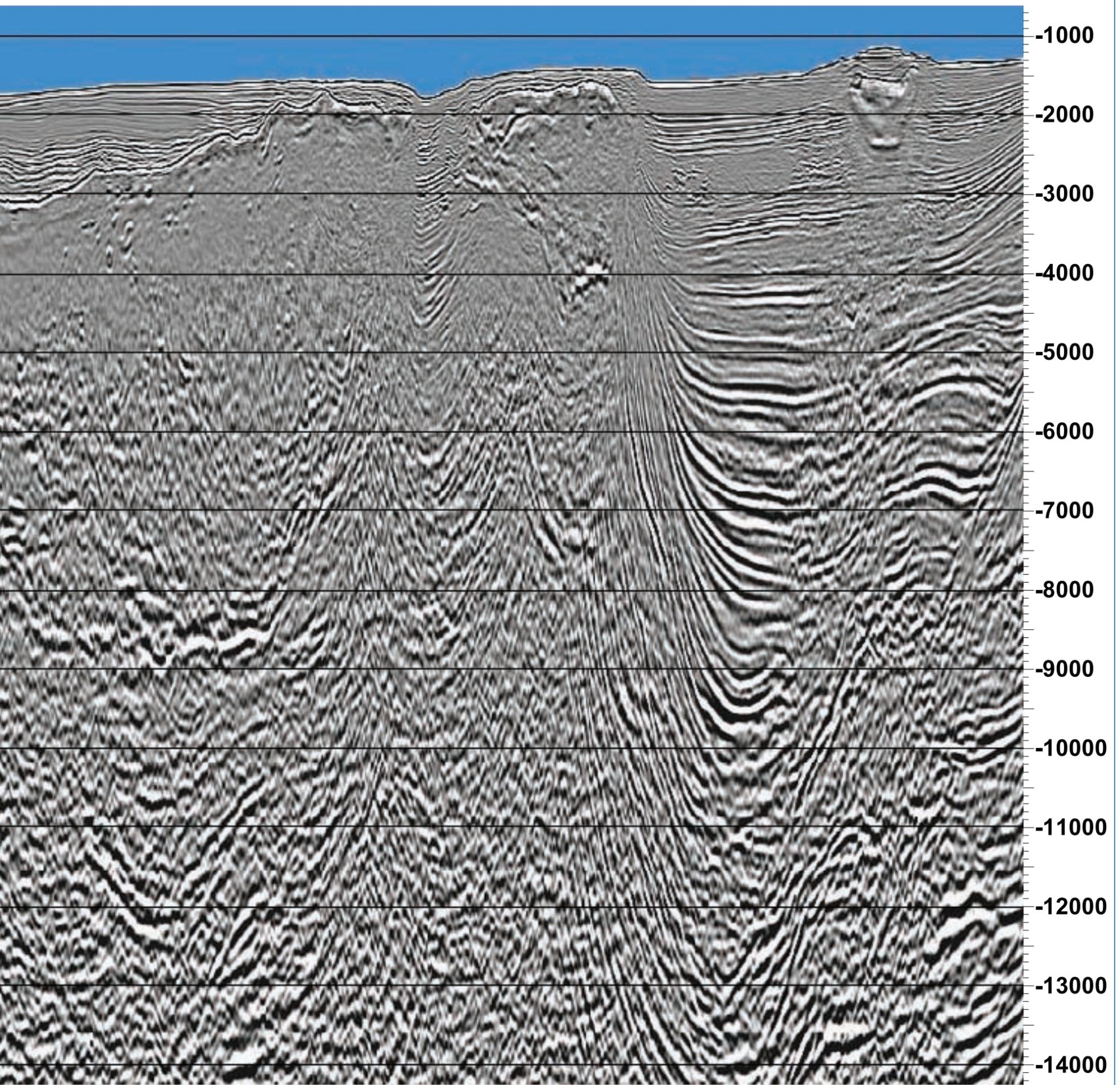
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## WashingtonWATCH

## Coalition to Address Access Issues

By DON JUCKETT

This is the first of a series of articles highlighting two related activities that will seek and encourage AAPG member participation in outreach efforts on legislative initiatives.

The focus is expanded OCS access and work force training and education – topics that have historically held great appeal for members.

Encouraged by the successful efforts of various members of the energy community in impacting the outcome of the recent MMS Five Year Plan, an expanded coalition of strategic partners is coalescing to build on the success of the MMS Five Year Plan initiative and build broad bipartisan support for the enactment of legislation of an OCS Access/Revenue Sharing bill. This legislation would be focused on the Mid-Atlantic States and Alaska.

The coalition members recognize that motivated and informed members will be pivotal in educating Congress and the administration, state and regional officials as well as the general population that the OCS both contains valuable petroleum resources and can be developed safely and beneficially to the nation and the regions.

A national group, Consumers Energy Alliance ([www.consumerenergyalliance.org](http://www.consumerenergyalliance.org)), together with other national and regional groups, proposes to work together through a group called the OCS Coalition to develop and implement a strategy to allow coastal states in the Mid-Atlantic and Alaska the opportunity to develop oil

*(Editor's note: Don Juckett, head of AAPG's Geoscience and Energy Office in Washington, D.C., can be contacted at [djuckett@aapg.org](mailto:djuckett@aapg.org), (703) 575-8293.)*

and natural gas resources off their respective coasts.

The Mid-Atlantic states – Virginia, North Carolina, South Carolina and Georgia – all have initiated OCS legislative initiatives at the state level.

The Coalition goals are:

- ✓ The passage of federal legislation allowing states to opt-out of federal OCS moratoria and participate in royalty revenue sharing.

- ✓ To encourage state action to opt-out of federal OCS moratoria and participate in royalty revenue sharing.

The Coalition already has engaged in discussion of inclusion of an education trust fund as part of the initiative, from which a portion would be directed to the maintenance of historical natural resources geology and engineering university programs. GEO-DC is working with other engineering and geological associations for the purpose of including language similar to the Energy and Mining School Reinvestment Act provisions in the proposed OCS legislation.

As the initiative progresses, we will keep members informed of the status and need for member involvement.

Here are some of the anticipated action items that will be required to move this package forward:

- Developing the key messages for members to use and to frame the

legislation.

- ✓ OCS access offers long-term energy policy options.

- ✓ Increased domestic production helps moderate uncertainty in energy prices.

- ✓ The potential resources are in key energy demand/supply areas.

- ✓ The legislation is targeted to provide equitable royalty funding for states that provide for development of OCS resources.

- ✓ OCS development will provide infrastructure and high quality jobs as well as energy supply.

- Provide the elements of draft legislation.

- ✓ Develop the five-state legislative proposal.

- ✓ Identify and encourage Congressional champions for the legislation.

- ✓ Build and expand the DC-based and grassroots support for legislation support.

- ✓ Build administration support for the legislation.

- Build and expand national and state coalitions.

- ✓ Secure support from a broadened group of national stakeholders that building on the groups that supported the 2006 OCS bill and the MMS Five Year Plan action call.

- ✓ Secure support from the key constituencies in the Mid-Atlantic states and Alaska.

- ✓ Work with strategic partners in each of the states to further coalesce support for OCS access and revenue sharing legislation at the state level.

Surrounding these will be ongoing efforts to engage individual members of the coalition to build constituency, develop media contacts and engage in outreach to the local, regional and national press.

Significant efforts will be focused on effectively utilizing the resources available in all of the affiliated OCS Coalition organizations to not only make the case to policy makers and the media, but also effectively engage environmental and conservation groups to explain and educate the goals of the initiative.

While this effort will progress with or without the active participation of AAPG, the Association member's participation and support will contribute significantly to the potential for success.

This will not be a slam-dunk kind of effort. To the contrary, it will require time to carefully build the constituency, to make the case for enhanced energy security, to convince the public that there is value and benefit in creating jobs and infrastructure on a regional basis and to educate the policy makers at many levels of the merits of expanded access.

We will work to keep members informed at every opportunity – through Washington Watch, through timely notices on the GEO-DC Web site and through individual contacts and Action Alerts. □



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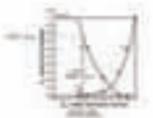


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## GEOPHYSICAL CORNER

## Which Seismic Wave Mode is Best?

(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.)

By BOB HARDAGE  
DIANA SAVA  
MICHAEL DeANGELO  
and RANDY REMINGTON

Salt-sediment boundaries are common seismic imaging targets that exist at many depths across several basins. Some of these boundaries are salt-sand interfaces; others are salt-shale interfaces.

In this column we consider the reflectivity behavior of P-P and P-SV wavefields at salt-sediment interfaces in marine environments, to determine if one seismic wave mode (P-P or P-SV) has an imaging advantage over the other for studying deep salt-related traps.

This analysis was done using a simple two-layer Earth model:

✓ In the first model, the bottom layer was salt (with properties  $V_P = 4550$  m/s,  $V_S = 2630$  m/s, and  $\rho = 2.16$  gm/cm<sup>3</sup>), and the top layer was sandstone (with properties  $\phi = 10$  percent,  $V_P = 4679$  m/s,  $V_S = 2840$  m/s, and  $\rho = 2.476$  gm/cm<sup>3</sup>).

✓ In the second model, the lower layer was this same salt, but the upper layer was first defined to be a "soft" shale (with properties  $\phi = 20$  percent,  $V_P = 3400$  m/s,  $V_S = 1754$  m/s, and  $\rho = 2.316$  gm/cm<sup>3</sup>) and then was changed to a "hard" shale (with properties  $\phi = 5$  percent,  $V_P = 4700$  m/s,  $V_S = 2775$  m/s, and  $\rho = 2.536$  gm/cm<sup>3</sup>).

In our terminology, a "hard" shale has velocities greater than salt, whereas a "soft" shale has velocities less than salt.

\* \* \*

Our modeled reflectivity behaviors are displayed as figure 1.

The P-P and P-SV reflectivities for a salt-sandstone interface (figure 1a) are almost identical to the reflectivities for the interface between salt and soft shale (figure 1b).

Two important principles are defined by these reflectivity functions:

✓ P-P reflectivity is large and P-SV reflectivity is small for small angles of incidence.

✓ The opposite is true for large angles of incidence where P-SV reflectivity is large and P-P reflectivity is small.

For many source-receiver offsets, this reflectivity physics means that in situations where the dip of a salt-sediment interface is small, the P-P mode should be a better choice than the P-SV mode for imaging that interface. In contrast, if a salt-sediment interface has a large dip angle, the P-SV mode should image the interface better than does the P-P mode.

Examples of these reflectivity behaviors are demonstrated by the events near the base of sequence D identified on figures 2 and 3.

The base of sequence D in figure 2 involves high-dip salt-sediment interfaces. These interfaces are bolder events in P-SV image space than they are in P-P image space, just as the reflectivity functions in figures 1a and 1b predict.

In figure 3, the salt-sediment interfaces near the base of sequence D are lower-dip boundaries. These interfaces are bolder reflections in P-P image space than they are in P-SV image space, which is what the reflectivity physics in figures 1a and 1b states.

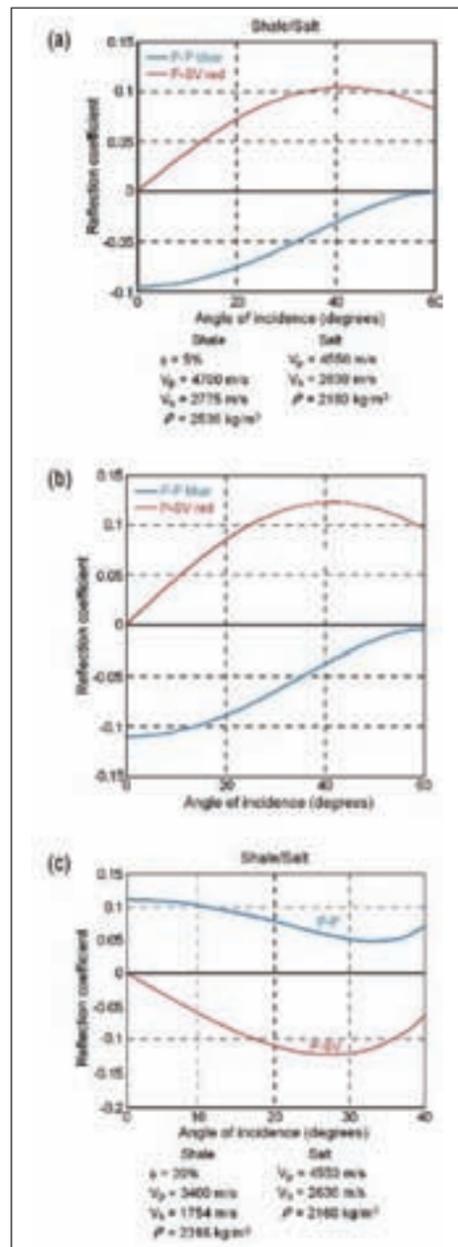


Figure 1 – P-P and P-SV reflectivities for interfaces between (a) salt and sandstone, (b) salt and soft shale and (c) salt and hard shale.

When evaluating these interface dips, it is helpful to use the distance scale marked below each seismic profile to judge the approach angle of raypaths arriving at the interface from source-to-receiver offsets of 10 kilometers, the maximum offset used to acquire these particular 4C OBC data.

The reflectivity of an interface between salt and hard shale (figure 1c) is different from the reflectivities of salt-sand and soft shale-salt in that P-P reflectivity is robust at all incidence angles. For an interface between salt and hard shale, the P-P mode will produce robust reflections not only at low-dip salt boundaries but also at high-dip boundaries.

\* \* \*

These reflectivity principles imply that optimal mapping of salt-sediment interfaces can result when both P-P and P-SV data are used for imaging and these two images are then combined into a unified geologic interpretation. □

(Editor's note: All of the authors are with the Bureau of Economic Geology in Austin, Texas. Seismic examples were provided by WesternGeco.)

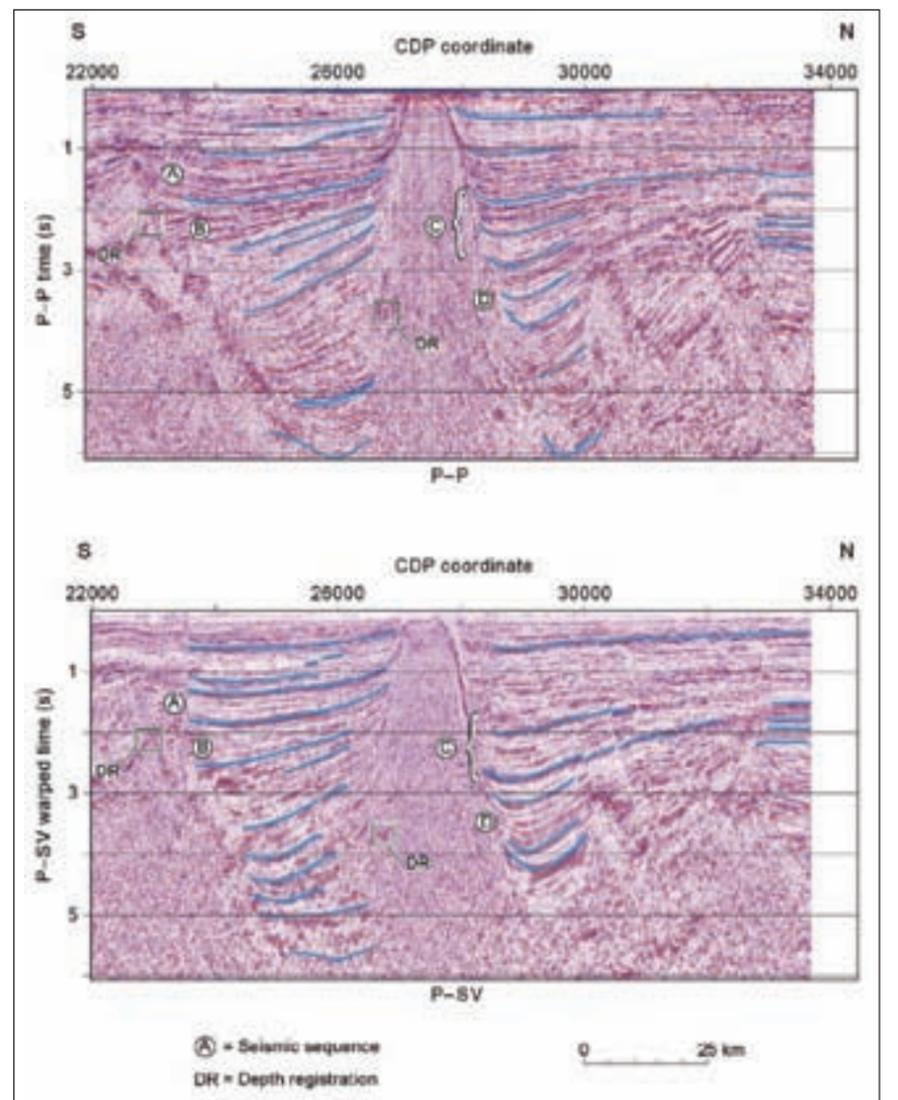


Figure 2 – Interpreted P-SV sequences (bottom) and their equivalent P-P sequence intervals (top). DR = depth-registration feature showing time-warped P-SV geology is positioned 100 ms earlier than P-P geology. Intervals A through D are depth equivalent and show that a P-SV sequence boundary often has no equivalent P-P sequence boundary, or that the depth-equivalent P-P event is much fainter than its companion P-SV boundary.

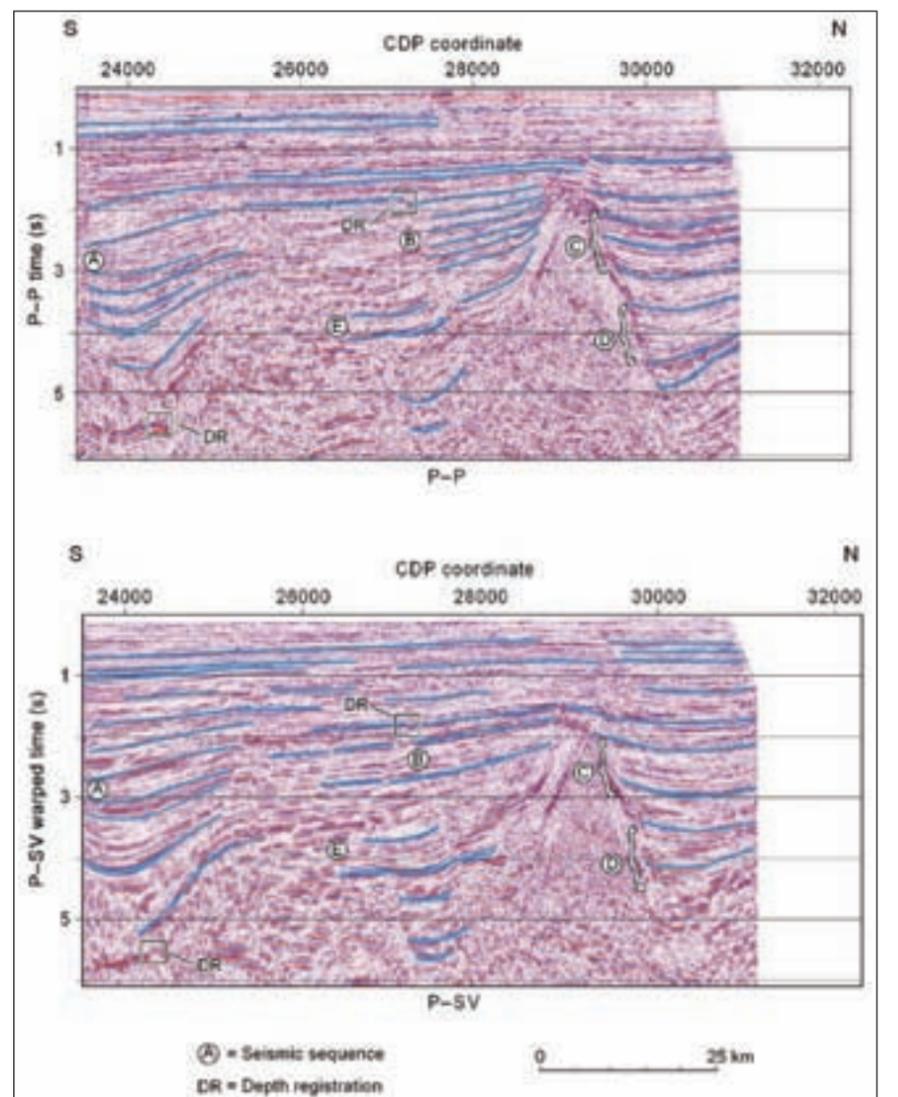


Figure 3 – Interpreted P-SV sequences (bottom) and their equivalent P-P sequences (top). DR = depth-registration feature showing time-warped P-SV geology is at the same image coordinates as P-P geology above 3 s, but ~100 ms later than P-P geology at 5.5 s. Intervals A through E are depth equivalent and show that a P-SV sequence boundary may have no equivalent P-P sequence boundary or a much fainter P-P boundary.



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*An Effort to 'Harmonize the System'***Uniform Definitions Considered**

By **KEN MILAM**  
*EXPLORER Correspondent*

Language differences present barriers not only for nations and cultures but for industries and sciences as well.

In one area – reserve and resources classification – several North American organizations are revising published guidelines, while the United Nations is taking a global view and trying to harmonize the guidelines with its own work in the area.

The projects are intertwined to ensure the interests of all stakeholders are served, according to people involved in the work.

As the petroleum industry has evolved in recent decades, so has the effort to classify and define resources and reserves.

The Society of Petroleum Engineers and World Petroleum Congress launched such a project in 1997; AAPG came aboard as a sponsor for revisions published in 2000. A 2007 update includes a new sponsor, the Society of Petroleum Evaluation Engineers. Thus, the effort is now known as the SPE/AAPG/WPC/SPEE Reserves and Resources Classification, Definitions and Guidelines.

Also referred to as the Petroleum Resource Management System, or RMS, the guidelines (expected to be approved in March by the SPE board of directors) were the subject of a paper at the recent AAPG Annual Convention in Long Beach, Calif.

The paper was co-authored by John Etherington of PRA International, Calgary, Canada, and John Ritter of Occidental Petroleum, Houston, chairman of the SPE Oil and Gas Reserves Committee.

Considerable industry input helped in forming the revised guidelines, Etherington said. A draft version was posted on the AAPG and SPE Web sites for industry review last October, supplemented by about 130 letters to companies and organizations around the globe requesting their comments.

Comments and proposed revisions also have been posted on various Web sites.

**What's New**

The major revisions to the RMS, according to Etherington, help resolve ambiguities involving unproved reserves and contingent resources.

Contingent resources may look similar to reserves but can't be classified as such because of some contingency like lack of infrastructure or environmental concerns, Etherington said.

Revisions emphasize the status of a development project applied to a reservoir; the project maturity modifiers included in the 2001 supplemental guidelines have been modified and formalized as sub-classes, he said.

"The focus on the project as a key enabler in the classification system is a major shift," he said.

"There's no change in the major classifications – just a sharpening of boundaries."

The prior Reserves Status modifiers (developed producing, developing non-producing and undeveloped) are unchanged; Economic Status modifiers

have been added that subdivide contingent resources.

✓ **Marginal Contingent Resources** are associated with technically feasible projects that are economic or projected to be economic, but are currently not committed to development.

✓ **Sub-Marginal Contingent Resources** are discoveries that lack enough data for a recovery plan, or appear to be technically feasible but not economic under current or forecast improvements in conditions.

A goal of the revisions is to align the RMS with real-world commercial evaluation processes. It is recognized that companies base their decisions on projects evaluated

using their internal forecasts on future conditions, including costs and prices.

The RMS is applicable to both conventional and unconventional resources, Etherington said.

"These are not disclosure guidelines for companies, but internal guides for managing their business," he said.

"We looked at eight (international classification) systems ... and where they were better we adopted those ideas," he added.

The 2007 RMS consolidates, builds on

continued on next page



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## Reserves Conference Planned

The critical matters of reserve estimates and reporting will be the focus of a high-level Multidisciplinary Reserves Conference planned this summer in Washington, D.C.

AAPG is co-sponsoring the event, in cooperation with the Society of Petroleum Engineers, the Society of Petroleum Evaluation Engineers, the World Petroleum Congress and the United Nations.

"Petroleum reserve and resource estimates are a critical part of the language used to communicate energy information to policy makers, regulators, the financial and investment community and the consuming public," said AAPG GEO-DC Director Don Juckett, chief staff liaison for the

conference.

"This conference will serve as an important step in the process of developing global acceptance of a set of universal standards for reserve and resource reporting," he said.

The conference's purpose, Juckett added, is to engage the users of reserves and resources data – corporate management, accounting, banking, investors and government – in active discussions with technical professionals who define and generate these estimates (petroleum engineers and geoscientists), with the goal of better understanding their nature, reliability, universality and use.

Participation in the conference, to be held June 24-26, is by invitation. □

continued from previous page

and replaces the 1997, 2000 and 2001 guidelines, and also includes an update of the 2005 glossary as an appendix.

### United Efforts

The United Nations Framework Classification was developed for solid fuel and mineral resources. A mandated effort to expand the UNFC to include fossil fuels began in 2002.

The resulting UNFC for Energy and Mineral Resources was the subject of another paper that was presented in Long Beach by Thomas S. Ahlbrandt of Petrohunter Energy Corp. in Denver.

"It's an effort to harmonize the system for oil and gas, coal and uranium," Ahlbrandt said.

The UNFC categorizes resources and reserves using three sets of criteria – economic viability, field project status and

feasibility, and level of geologic knowledge.

The project maturity categories from the 2001 SPE/WPC/AAPG supplemental guidelines served as the basis for field project status criteria.

The ad hoc group of experts charged with updating the UNFC includes Ritter and other representatives from SPE, AAPG sections in the United States and Europe, OPEC, the Russian Federation and several other groups.

Involving so many interests is no accident, Ahlbrandt said.

"AAPG played a significant role all along in this – some of the original definitions were developed in the 1920s in cooperation with the USGS (U.S. Geological Survey)," he said.

The UNFC is "trying to cover everything from diamonds to coal – it's tricky," said Etherington, who, like several other AAPG and SPE members, also is involved with the UNFC and IASB projects.

Complicating the missions are the many classification systems used by different countries, individual companies and government agencies.

The U.S. Securities and Exchange Commission has certain requirements, and U.S. tax law is independent of that, Ahlbrandt said. Canadian firms have to deal with their own government's regulations, he said.

"Definitions didn't translate easily," he said.

The UNFC uses a numerical system to describe field developments, avoiding some of the language problems, he said.

Exercises allowing users to "map" a project from the RMS or other systems to the UNFC have been developed to show the system's transparency, he said.

The framework recognizes the increasing worldwide importance of contingent and unconventional resources, he said.

"These are not trivial exercises," he said, "yet real progress has been made."

### 'Worthwhile Effort'

Ken Mallon, liaison between SPE's Oil and Gas Reserves Committee and AAPG, and an AAPG representative on the UNFC committee, said that making the RMS and UN system compatible is a "huge ... worthwhile effort.

"There also is considerable effort to map petroleum to hard minerals classifications," Mallon said, "and to have the same meaning in the financial world."

Arriving at consensus with 45 to 50 representatives from various countries and industries takes "an enormous amount of time – it won't happen overnight, especially with resources in question around the world," he added.

Despite the amount of work and publicity the projects involve, none of the systems is imposed upon anyone.

In Etherington's words: "Our only power is industry acceptance." □



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## 3-D Showed the Way

**CO<sub>2</sub> Puts New Fizz in Old Field**

By DIANE FREEMAN  
*EXPLORER Correspondent*

New 3-D seismic data and the injection of CO<sub>2</sub> have given new life to a 100-year-old oil field in Wyoming.

Anadarko Petroleum increased production of the historic Salt Creek field with the use of new tools, new technological expertise and a new way of looking at old plays.

"You can still find oil in a 100-year-old field with some new technologies," said Brian P. Elias, staff geologist with Anadarko, as he described how CO<sub>2</sub> EOR extended the life of this century-old field.

"(And) it was also environmentally friendly.

"We expect to recover 10-15 percent more oil in place because of the injector," he added.

Elias described the project as one of several speakers during the recent one-day, 13th annual 3-D Seismic Symposium sponsored by the Rocky Mountain Association of Geologists and the Denver Geophysical Society.

A record number of 700 participants attended the conference this year, officials said.

Located in Wyoming's Natrona County, Salt Creek field lies just north of Casper

and has a large CO<sub>2</sub> source byproduct of natural gas production at LaBarge.

"In 2006 it was averaging 60 million cubic feet a day," Elias said. The field now has 1.6 to 1.7 billion barrels of oil in place.

**Revealing the Unknown**

Salt Creek Field was started in the late 1800s by seeps, Elias explained, with the first well drilled there in 1908. At its peak production period in the 1920s Salt Creek field produced 100,000 barrels of oil a day.

Anadarko acquired the field in 2002, and the first CO<sub>2</sub> injector was performed

in 2004.

"The 3-D data set was acquired in 2005," he said. "One of the challenges was that it requires the right kind of reservoir rock ... We see added value to shooting 3-D to this play."

The high-resolution, 53-mile 3-D survey that was acquired took 30 days to complete.

"This 3-D was specifically designed to image the Second Wall Creek sand, which is the main producing interval within the field," Elias said.

Design parameters yielded outstanding imaging of reflectors from as shallow as 100 meters, down to basement at over 3,000 meters.

The results from the data revealed previously unseen faulting and fracturing geometries within the shallow horizons. It also disclosed deeper structures in the granitic basements, he said.

"An east-west line across the middle of the field clearly shows that Salt Creek field is a classic basement involved thrust fault generated fold," he said.

Also, amplitude anomalies were observed on flattened time slices at the Second Wall Creek interval corresponding directly to injector-producer patterns with CO<sub>2</sub> flood areas initiated prior to seismic acquisition, he said.

With the injection of CO<sub>2</sub>, it can produce more than 20,000 barrels a day, he said. That marked an increase from just 3,000 barrels a day previously, he said.

"We want to see an old field through new eyes," Elias said. "That's why we did the 3-D."

"It helped us to better understand the fluid flow pathway," he added. "With a better designed injector it produced a pattern."

**Increased Production**

After the CO<sub>2</sub> was injected, there was a substantial increase in production.

"It was a 10-20 percent relative amplitude due to the increase in pressure," he said.

"It helped us to better understand the structural complexity. We've seen a 4,500 bopd to date," Elias said.

"This large north-south trending asymmetric anticline has the distinction of being the largest oil field in the state with cumulative reserves of 700 mmbo," he said.

Anadarko acquired the field through the acquisition of Howell Petroleum in 2003 for the purpose of increasing reserves through CO<sub>2</sub> injection. The company then built a 125-mile pipeline from Lost Soldier Field interconnect to access CO<sub>2</sub> sourced at the Exxon-operated Shute Creek Plant in Lincoln County, he said.

Injection began in January 2004. So far, two of 12 proposed incremental phases of development have been completed.

Production is now in excess of 7,000 bopd with over half attributed to CO<sub>2</sub> enhanced recovery, he noted.

He pointed out that maximum daily production is projected to reach 20-25 mbopd in 2020 with addition EOR reserves estimated at 200 mmbo.

Also, Anadarko expects to sequester about 490 bcf of CO<sub>2</sub> by the end of the project, he said.

Detailed mapping of shallow fault geometries should eventually lead to better implementation of tertiary CO<sub>2</sub> injector pattern design, Elias said. Meanwhile, possible future 4-D time lapse seismic may provide insight regarding flood dynamics and efficiency. □

**ground truth** \ 'graund 'trũth\ noun, [O.E. *grund* + *trEowth*]

1. *Common* (a) the state of being correct; (b) in accordance with the body of real data, events, and facts; (d) of being in accord with fact or reality; (e) fidelity to an original concept or to a standard.

2. *Petrophysics* (a) any measurement of an observed rock property that can be used to validate or verify data or a technique; (b) measurements used for model calibration and validation; (c) data that issue from quantitative, reproducible measurements of a phenomenon of interest.

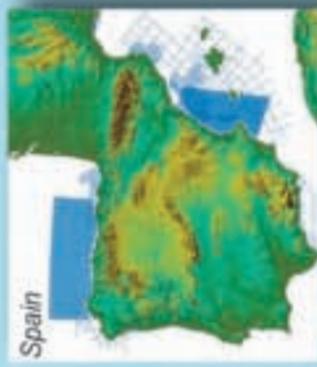
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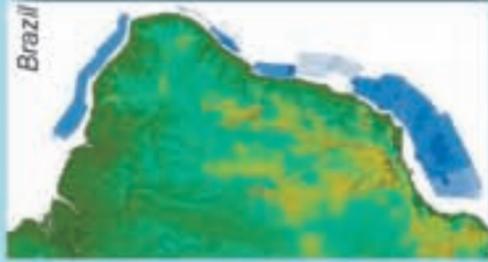
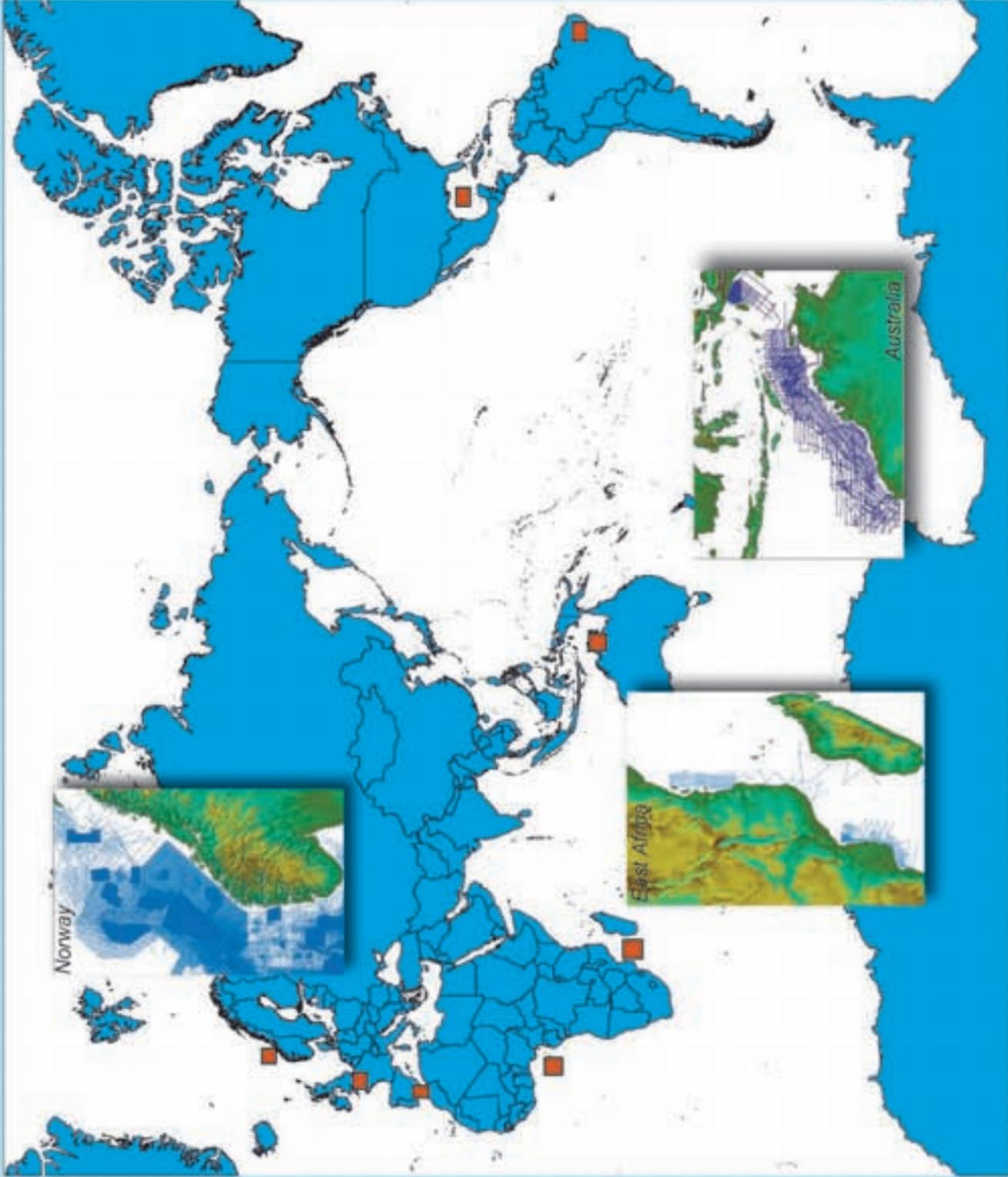
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## 'World-Class Geological Field'

**Reserve Site Designation Applauded**

By BARRY FRIEDMAN  
*EXPLORER Correspondent*

Calling the Irvine Ranch Land Reserve (IRLR), "a shining example of our nation's natural treasures," National Park Service Director Fran Mainella recently designated 37,000 acres of the IRLR a "National Natural Landmark," making it the first site in California to receive NNL designation since 1987.

These NNLs – and there are fewer than 600 of them nationwide – are awarded by the Interior Department and bestowed upon areas, both public and private, that are recognized as outstanding examples of the country's natural heritage.

Specifically in the case of Irvine, the areas recognized include:

✓ Limestone and Fremont canyons, in the northern section of the Irvine Ranch in unincorporated county territory.

✓ Peters Canyon Regional Park, near the city of Orange and maintained by the County of Orange.

✓ Crystal Cove State Park and Laguna Coast Wilderness Park, which form a vast, contiguous open space system stretching between the cities of Newport Beach and Laguna Beach and extend inland along Laguna Canyon Road.

✓ Bommer Canyon, a key part of the city of Irvine's southern open space preserve.

The Irvine Reserve now represents one of the few places in Southern California where habitats have been



Photos by Stephen Francis

Santiago Creek, part of the Irvine Ranch Land Reserve, a new National Natural Landmark.

preserved that stretch from the mountains to the sea, protecting plants and endangered animals.

To that end, California Gov. Arnold Schwarzenegger, when visiting the reserve, said, "We must leave the state a better place than we found it."

entirely privately owned.

Participation in the NNL Program does not carry any requirements regarding public access, either, but is simply an agreement between the property owner and the federal government "to retain the integrity of their NNL property as it was when designated."

As for the site at Irvine, AAPG member John Cooper, emeritus professor of geology at California State University, Fullerton, and lead author on the IRLR-PNNL Geology Report, Evaluation of the Irvine Ranch Land Reserve Potential National, says, "I know of no other place where such a compact area contains the record of such an important, diverse and dramatic geologic history – a fascinating story that lies in the record of the rocks, written in stone."

Cooper presented the paper "The Irvine Ranch National Natural Landmark, Orange County, California: A Geologic Record That Preserves The Major Tectono-Stratigraphic Events of the Greater Los Angeles Basin Region and a Natural Laboratory for Neotectonic Research," at the recent AAPG Annual Convention in Long Beach, Calif.

The IRLR is the best of a rare set of places in the South Pacific Border Province where the geologic history of

**'Important, Diverse and Dramatic'**

Like Natural Historical Landmarks, an NNL designation is voluntary and does not require designated properties to be owned by public entities – in fact, more than 30 percent of NNL land is

continued on next page

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23 - 27

**Fundamentals of Applied Geophysics**

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23 - 27

**Applied Subsurface Geological Mapping**

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30

**Chimneys for Seal & Charge Risk Assessment**

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#### May 2007

2 - 4

**Basics of the Petroleum Industry**

Houston 3 day course, instructor Mr. H. Miller

7 - 11

**Descriptive Lithology Analysis of Cuttings & Cores**

Houston 5 day course, instructor Dr. R. Merrill

14 - 18

**Seismic Survey Design, Acquisition & Processing**

London 5 day course, instructor Dr. M. Thapar

14 - 18

**Applied Subsurface Geological Mapping**

Houston 5 day course, instructor Mr. S. Agah

21

**Geopressure & Pore Pressure Prediction Fundamentals**

London 1 day course, instructor Dr. S. Shaker

22 - 23

**Geopressure: Analysis, Application, Appraisal & Risk Assessment**

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continued from previous page

a long time-span (nearly 90 million years), intact and structurally uncompromised stratigraphic record is well preserved, both naturally and through a legacy of sound stewardship that has been sensitive to conservation and protection."

Another AAPG member and former AAPG Distinguished Lecturer, Richard J. Behl, professor of geological sciences, California State University, Long Beach, and current president of the SEPM Pacific Section, agrees:

"It would be hard to overemphasize the importance of the Irvine Ranch National Natural Landmark's value for science and education," Behl said.

Calling Irvine a "world-class geological field" because of its potential for scientific research, Behl noted that the "landscape contains large swaths of coastal sage scrub, a rare habitat found only in coastal southern California and northern Baja California. The combination of unusual geological and rare biological characteristics is what gives these parts of the Reserve such scientific value.

"I do not think that there is another NNL site in all of the United States," he said, "that places such a wealth of geologic features as close to such a major population center."

**A Million Reasons Why**

And that center, of course, is Los Angeles.

Behl says that the more America becomes urbanized, the more "removed" people are from the natural environment and it is places like Irvine Ranch Land Reserve that brings them close, literally, to nature.

"Designation of the IRLR ... will greatly enhance the public understanding of earth history and the geologic record of where they live," he added.

Cooper, too, believes that the NNL designation will draw attention to the scientific and educational importance of the region and help people "to better understand and appreciate the culture of conservation and preservation."

Specifically, the site at Irvine is populated with:

- ✓ High-quality exposures of both continental and marine sedimentary deposits that record the history of the North American margin since the late Mesozoic.

- ✓ Different tectonic settings and provenances and contain important vertebrate fossils.

- ✓ Marine deposits of a larger number of depositional and tectonic settings.

- ✓ Paleontologic records, including superior assemblages of vertebrate and invertebrate fossils.

- ✓ Igneous deposits that include intrusives and extrusives associated with Jurassic-Cretaceous subduction.

"This is a rare combination of fascinating and important geologic features for one limited area," Behl said.

While he thinks the national designation is beneficial to future study, he hopes the "designation does not end up placing an additional layer of bureaucracy over the area.

"However, the culmination of the transfer of land out of private hands (where there are liability concerns or fear that scientists may discover something that may interfere with the development potential of the land) to the public will be and already is beneficial," he said. "I think that it will

provide a stronger context for many kinds of plans and proposals from pure scientific research to educational programs.

"There were many important geologic locations in private ownership that became inaccessible because of litigation and regulatory concerns until consensus plans were developed," he added.

These designations may, though, be more of a psychological and philosophical boost than a practical and educational one.

"I am not really sure," Behl said, "what the concrete benefit of the NNL designation will be other than in uniting the entire community with a shared understanding and commitment to preserve, cherish, study and understand these lands that are still wild, yet so close to literally tens of millions of people." □



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**MEETINGS OF NOTE**

(\* Denotes new or changed listing.)

**2007 U.S. Meetings**

April 22-24, Southwest Section, AAPG, annual meeting, Wichita Falls, Texas.

April 30-May 3, Offshore Technology Conference, annual meeting, Houston.

June 2-6, Society of Professional Well Log Analysts, annual meeting, Austin, Texas.

June 13-16, American Association of Petroleum Landmen, annual meeting, New Orleans.

\* Aug. 23-24, Summer North American Prospect Expo (with AAPL), annual meeting, Houston.

Sept. 9-11, Mid-Continent Section, annual meeting, Wichita, Kan.

Sept. 16-18, Eastern Section, AAPG, annual meeting, Lexington, Ky.

\* Sept. 23-28, Society of Exploration Geophysicists, annual meeting, San Antonio.

\* Sept. 23-29, Association of Environmental and Engineering Geologists, annual meeting, Universal City, Calif.

Oct. 6-9, Rocky Mountain Section, annual meeting, Snowbird, Utah.

Oct. 9-14, AAPG Foundation Trustee Associates, annual meeting, Maui, Hawaii.

Oct. 21-23, Gulf Coast Association of

Geological Societies, annual meeting, Corpus Christi, Texas.

Oct. 28-31, Geological Society of America, annual meeting, Denver.

Nov. 10-14, Society of Petroleum Engineers, annual meeting, Anaheim, Calif.

**2007 International Meetings**

\* May 14-17, Canadian Society of Petroleum Geologists, annual meeting (with Canadian Society of Exploration Geoscientists and Canadian Well Logging Society), Calgary, Canada.

\* May 23-27, Geological Association of Canada-Mineralogical Association of Canada, annual meeting, Yellowknife, Canada.

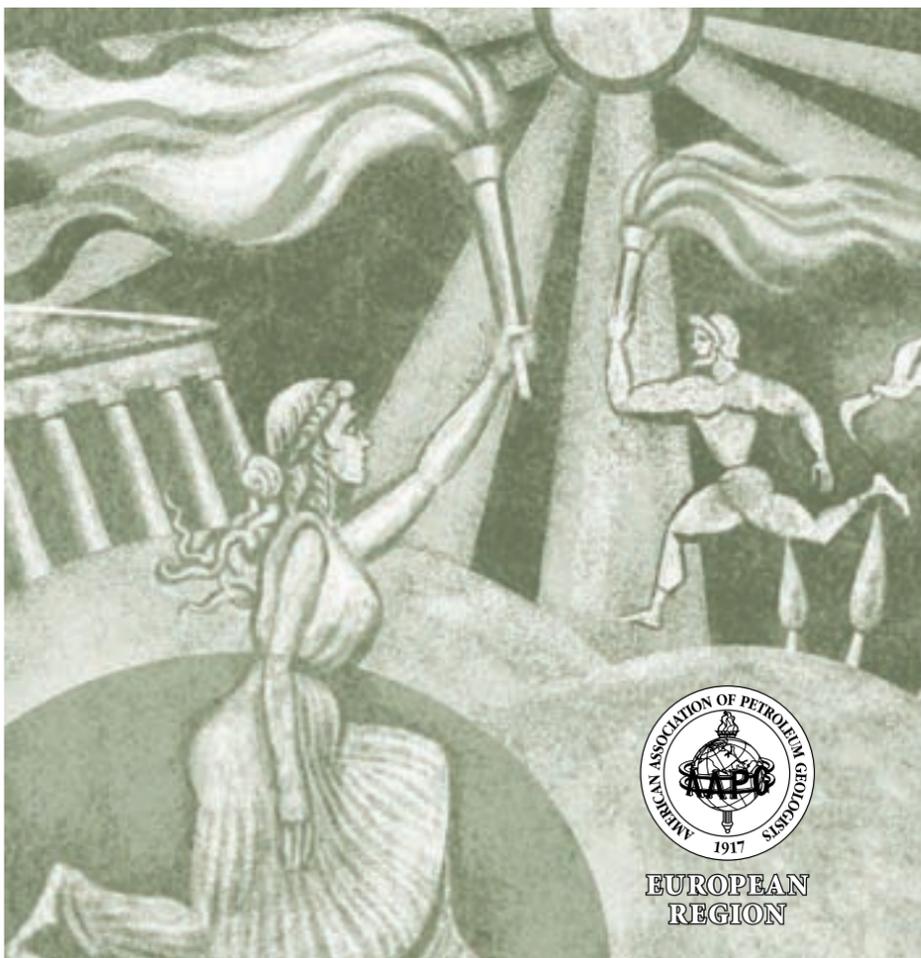
\* June 11-14, European Association of Geoscientists and Engineers, annual meeting, London, England.

\* Aug. 19-25, Society for Organic Petrology, Canadian Society for Coal Science and Organic Petrology, and the International Committee for Coal and Organic Petrology, joint annual meeting, Victoria, Canada.

\* Sept. 4-7, Offshore Europe (SPE), annual meeting, Aberdeen, Scotland.

\* Nov. 18-21, AAPG European Region, Athens, Greece.

\* Dec. 4-6, International Petroleum Technology Conference, (AAPG, EAGE, SEG, SPE), annual meeting, Dubai, U.A.E.

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**WWW.UPDATE**

# Online Calendars Help In Planning

By JANET BRISTER  
Web Site Editor

Planning ahead.

Do people still do that today?

Well, if you do you must have a calendar – and AAPG has provided a couple of calendars to help you make your plans.

From the home page you'll find a string of links in blue just to the right of the AAPG logo and address: Members Only, Energy Facts, Links, Site Map, Contact Us and **Calendar**.

This calendar is one I'd like you to explore. Within it are meetings, meetings and more events. Most are meetings that AAPG is organizing, supporting or endorsing. A few are simply of interest to AAPG membership and provided for your consideration.

It is pretty simple to navigate using the Next>> and <<Prev links. The Yearly View makes it easy to quickly jump to the month you are interested in.

As you click on each entry you will be provided details and usually a link to the meeting or educational opportunity site.

Now that summer is approaching, this calendar or the education calendar may help you plan the remainder of your year's events.

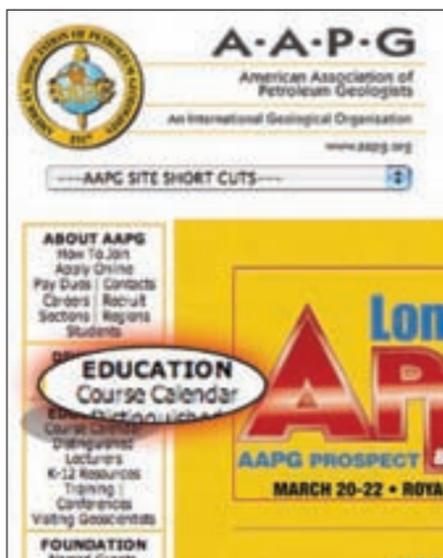
## What Education Calendar!?

Oh! Well ... The course calendar is found by returning to the home page and using the navigation table on the left. The link is located under the bold "EDUCATION" heading.

All the courses and field seminars listed here are also located in the first calendar I mentioned above.

Now, if you need a course to attend but the timing isn't critical, at the top of this calendar are links to rosters of the field seminar, short course and other offerings.

Or you may simply click on the calendar cover and download a PDF of 2007 training opportunities.



## Simply Draw a Square

Did you discover the new Geographic Search for the BULLETIN and other AAPG publications?

On your Members Only home page there is a big black box that links to the map-based search of the AAPG BULLETIN.

To use it you'll need to disable your pop-up blocker. Then take a few minutes to explore the tools on the top left corner.

These tools zoom in, zoom out, restore the map to its original size, grab the map to move it and selects.

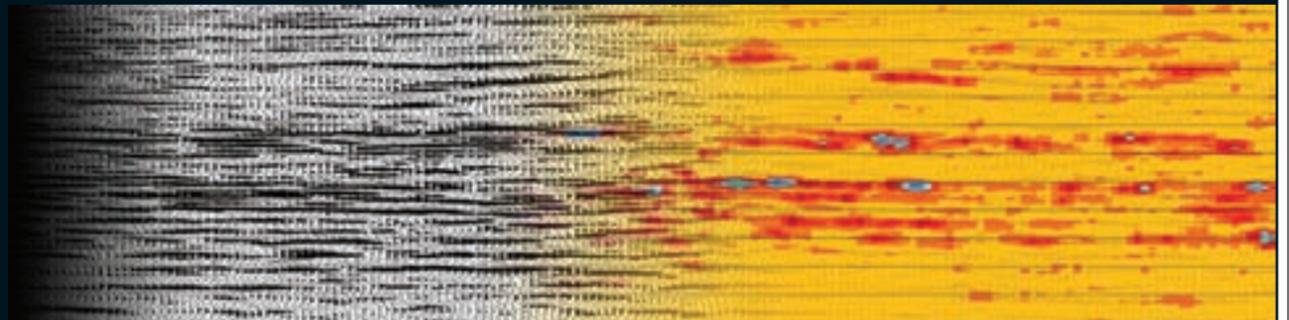
The select tool (the dotted rectangle with the arrow) is used to click and drag on an area of the map. You know – draw a square. It will then pop open a window listing all articles in the BULLETIN archives that pertain to this location.

The search results are listed in chronological order with the most recent first.

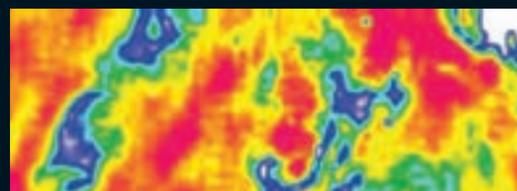
Good browsing! ☐

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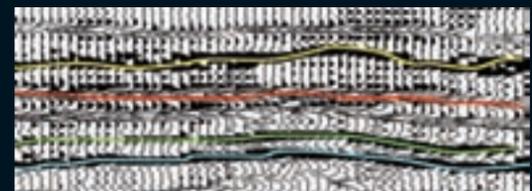
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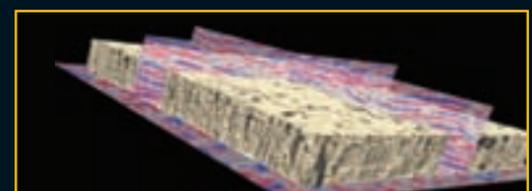
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## REGIONS AND SECTIONS

# Conference Sparked 'Best Practices' Goals

(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.)

News items, press releases and other information should be submitted to the EXPLORER/Regions and Sections, P.O. Box 979, Tulsa, Okla. 74101.

Contact: Carol McGowen, AAPG's Regions and Sections manager, at

1-918-560-9403; or e-mail to [cmcgowen@aapg.org](mailto:cmcgowen@aapg.org).

This month's column, a report on the "best practices" segment at the recent AAPG Leadership Conference, was compiled by Carol McGowen.)

The success of the recent 2007 Leadership Conference held in Tulsa – and particularly the focus groups on best practices – stems from what one might call a personal and organizational willingness to learn.

From the first e-mail request to share examples of "what's working in your Section, Region or affiliated society," AAPG leaders around the world were quick to respond with a sense of curiosity and a desire to learn from their colleagues.

### The Need

But why the need to gather examples of successful practices? Why the need to come together to talk about such common practices as how meetings are run, how new members are recruited, how revenue is generated?

Indeed, most Sections and many of the affiliated societies have been organized for many years, and their annual meetings run like clockwork.

But AAPG members, in general, are an aging group. Contrast member demographics with a boom time for the industry, and the need to recruit new members and encourage students to pursue a career in geosciences. And when the industry is booming, volunteer time is scarce, so the need for more efficient methods is more important than ever.

The Regions, however, formed during the 1990s, have accomplished much since their inception. Leaders have faced up to the challenge of members within their Region who may not share a common language; whose membership spans vast geographic distances; and whose economic situations vary broadly.

The Leadership Conference offered AAPG officers, officer candidates, Region, Section and affiliate society leaders an opportunity to learn from past experiences and benefit from new perspectives, while becoming reinvigorated and rededicated to the work of AAPG.

### Define 'Best Practice'

"Best Practices" is a management idea that asserts that there is a technique, method, process or activity that is more effective at delivering a particular outcome than any other technique, method, etc.

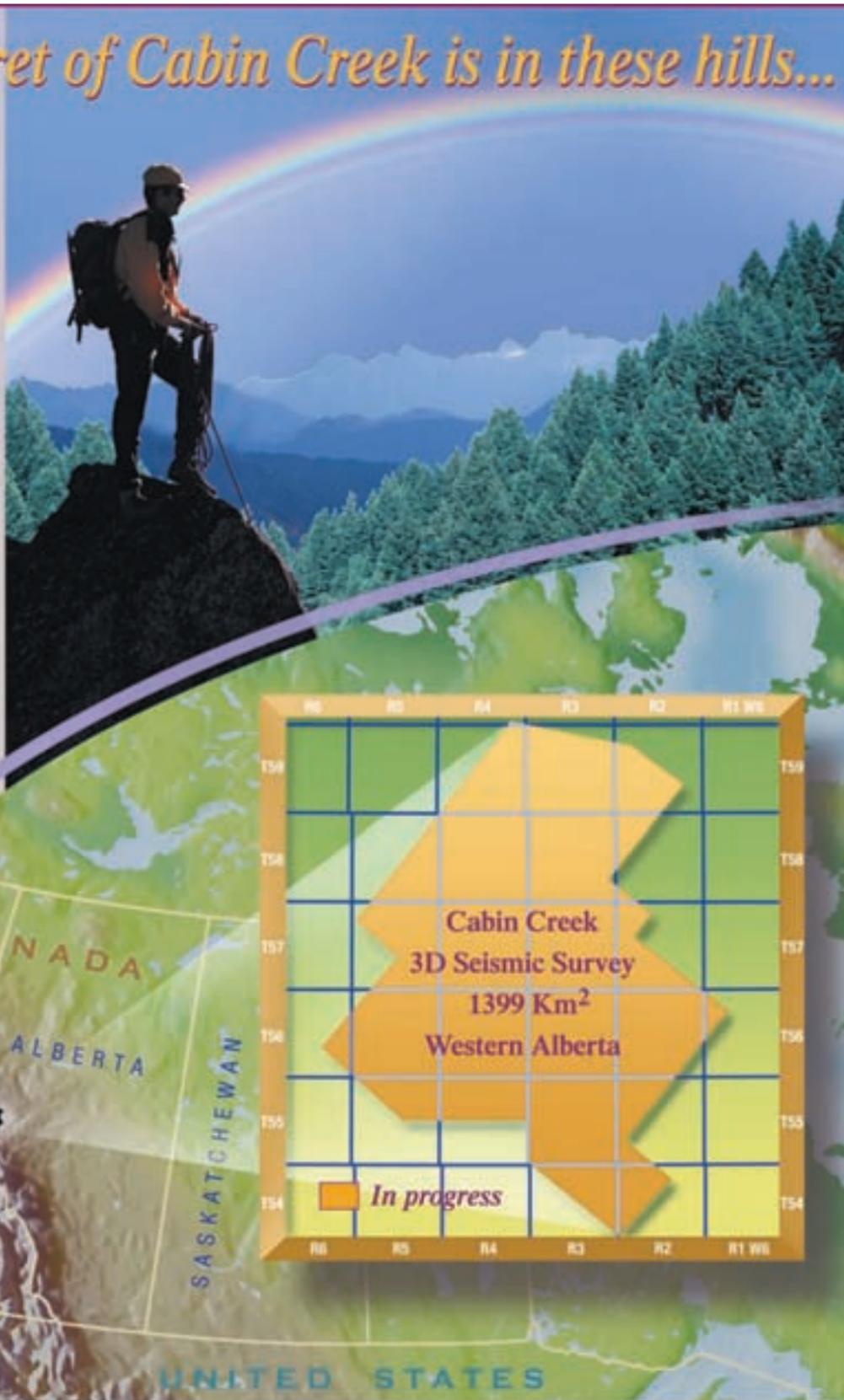
The idea is that with proper processes, documentation and testing, a project can be rolled out and completed with fewer problems and unforeseen complications – in other words, with greater efficiency and a greater chance of success.

The notion of 'best practices' does not commit people, companies or organizations to one inflexible, unchanging practice. Instead, "best practices" is a philosophical approach

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*New Ideas for New Frontiers*

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based upon continuous learning and continual improvement.

**The Process**

Understanding that learning and the transfer of ideas is an interactive and dynamic process, the focus group sessions were designed to do four things:

- ✓ Start from a basis of 99 best practices submitted in advance by e-mail.
- ✓ Invite participants to add to or build on identified categories or themes.
- ✓ Brainstorm and discuss as a group.
- ✓ Prioritize and document the resulting ideas through a voting process.

Participants also were encouraged to identify areas for linkages between Regions and Sections, as well as areas where the AAPG headquarters staff could assist or facilitate.

Conference attendees chose to attend one or both 1-1/2 hour focus group sessions. Of the 147 people who attended the Leadership Conference, 133 came from 19 U.S. states and 14 hailed from Canada and seven countries within the Europe and Asia-Pacific Regions. Thirty-eight people participated in the Sections & Regions group; 26 in the Affiliated Societies group, including departmental representatives of AAPG staff.

AAPG officer candidates and yours truly facilitated the focus groups. Candidates for vice president of Sections, John Armentrout and John Curtis, together with candidates for vice president of Regions, John Hogg and John Kaldi, led the Best Practices of Sections and Regions group; candidates for AAPG secretary, Ted Beaumont and Terry O'Hare, led the Best Practices of Affiliated Societies focus group.

A final report of discussion results and voting priorities for both focus groups may be found on the AAPG Web site at [www.aapg.org](http://www.aapg.org).

**An Example**

Space does not permit including all the best practices in this article, but here are three ideas prioritized by the focus group that are all related to making the job of Section/Region leaders more efficient and effective through on-going opportunities for sharing proven ideas:

✓ AAPG headquarters capture Section and Region operations information and place it on a Web site, where Regions and Sections can evaluate "best practices" for improving their respective operations: include organizational chart; procedure manuals and forms, especially for meetings and training programs; accounting/finance practices; insurance policy, especially for field programs; member services offered; outreach practices; and awards programs.

✓ Establish a Regions/Sections Operations Information Web site, so Region or Section officers can quickly access the data and select and implement "best practices."

This Web site should include links to Sections/Regions programs, newsletters and general bulletin board information.

✓ Provide an online discussion forum within the Regions/Sections Web site, providing an opportunity for sharing issues across the leadership community.

**What's Next?**

Reports from the Leadership Conference will be circulated among the

conference participants and posted for viewing and comment by all AAPG members. Specific recommendations and action steps will be submitted to the AAPG Executive Committee for their consideration and implementation.

The sharing of experience and transfer of knowledge is a people-to-people process, but meaningful relationships precede sharing and transfer. Best practices within AAPG's Sections, Regions and affiliated societies will continually evolve.

Let's keep the conversation going.

Look for descriptions of other best practices in this column each month – and if you have a "best practice" to share from your Section, Region or affiliated society, or if you would like to receive a copy of the 99 best practices compilation, contact me at [cmcgowen@aapg.org](mailto:cmcgowen@aapg.org). □



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# FOUNDATION UPDATE

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 Louisa Jane Clegg  
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*In memory of Charles Severy*  
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 Heiko Leopold Roethl  
 Lance Ruffel  
 Landong Parasi T. Silalahi  
 Gregory John Smith  
 Leah D. Smith

A new member has been added to the AAPG Foundation Trustee Associates. The new trustee associate is:  
 Rick Black, B&W Exploration,

Oklahoma City.  
 His joining brings the number of trustee associates to 261.

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 Sherilyn C. Williams-Stroud

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## Shipp Makes Season's Final DL Tour in April

AAPG's Distinguished Lecture program offers its final tour of the season, as R. Craig Shipp makes his 22-day tour of Asia.

Shipp, the geohazards assessment team leader for Shell International E&P, Houston, begins his tour April 3-4 in Kuala Lumpur, Malaysia, speaking to the Geological Society of Malaysia and the KL Geological Society, respectively.

Shipp is this year's Roy M. Huffington Distinguished Lecturer, which is an international tour funded by the AAPG Foundation through contributions from the Huffington family in honor of the oilman-geologist.

Shipp will offer two talks:  
 "Significance and Recognition of Mass-Transport Deposits in Deepwater Environments."  
 "Where Offshore Drilling Meets Shallow Geology: Impact of Near-Surface Depositional

Systems on Deepwater Operations."

The remaining scheduled stops on his tour include:

- ✓ April 9 – Chevron Bangladesh/Dhaka and Jahangirnagar universities, Dhaka, Bangladesh.
- ✓ April 10 – Association of Petroleum Geologists, Delhi, India.
- ✓ April 13 – Shell Oil, Bangalore, India.
- ✓ April 16 – SPE Shekou Section, Shekou, Shenzhen, People's Republic of China.
- ✓ April 18 – SPE Vietnam Section, Ho Chi Minh City, Vietnam.
- ✓ April 19 – China University of Geosciences, Beijing, People's Republic of China.
- ✓ April 23 – SPE Korean Section, Seoul, Korea.
- ✓ April 25 – Japanese Association for Petroleum Technology, Tokyo.



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## PROFESSIONAL NEWS BRIEFS

**Steve Adcock**, to geological consultant-seismic stratigraphy research, Saudi Aramco, Saudi Arabia. Previously geological specialist-exploration data management, Saudi Aramco, Saudi Arabia.

**Paul M. Basinski**, to geologic fellow, unconventional resources new ventures, ConocoPhillips, Houston. Previously interim exploration manager-eastern United States, ConocoPhillips, Houston.

**Dave Bodecott** has been appointed exploration director and board member, Rockhopper Exploration, Salisbury, England. He also continues as a consultant.

**Jason Byl**, to exploration geologist, Bankers Petroleum (US), Camarillo, Calif. Previously a consulting geologist, Woodland Hills, Calif.

**Andreas Brandt**, to new ventures and business development coordinator, Dragon Oil, Dubai, UAE. Previously senior geologist and senior geological expert, RWE Dea, Hamburg, Germany.

**Stan Fine**, to senior geologist, Murphy Oil Sarawak, Kuala Lumpur, Malaysia. Previously senior managing consultant-geology, Landmark Graphics, Kuala Lumpur, Malaysia.

**Leonel A. Gomez**, to senior research geologist, Upstream Research Center, ExxonMobil, Houston. Previously student, University of Texas at Austin.

**James M. Hill**, to vice president-exploration, Bankers Petroleum (US), Camarillo, Calif. Previously with Tartan Energy, Camarillo, Calif.

**Robert Hobbs**, to manager-seismic services and reservoir characterization, Marathon Oil, Houston. Previously president-EAME, Veritas Geophysical, Crawley, United Kingdom.

**Jens Hustedt**, to geological adviser, Fronterra Integrated Geosciences, Houston. Previously staff business development geologist, Baker Hughes, Houston.

**Tom Kastner**, to staff geologist, ConocoPhillips, Houston. Previously senior geologist, Anadarko Petroleum, Houston.

**Jeff Lawton**, to senior geophysicist, Bankers Petroleum (US), Camarillo, Calif. Previously with Crestline Resources, Santa Barbara, Calif.

**Mark H. Leander**, to senior geophysicist, Maersk Oil, Houston. Previously senior staff geophysicist, Fugro Multi Client Services, Houston.

**Douglas J. Mullett**, to energy resources group supervisor, Ohio Geological Survey, Columbus, Ohio. Previously senior hydrogeologist, Conestoga-Rovers & Associates, Plymouth, Mich.

**Timothy Murin**, to manager-technical services business development, CNX Gas, South Park, Pa. Previously chief executive officer, Griffin Oilfield Developers, Pittsburgh.

**Duncan Nightingale**, to director-business development, DANAGAS PJSC, Sharjah, UAE. Previously general manager, EnCana International (Oman) and Middle Business Development, Muscat, Oman.

**Valary Schulz**, to senior geologist, Wynn Crosby, Plano, Texas. Previously senior geologist, Matador Resources, Dallas.

**Mary Smithey**, to senior staff geologist-Tierra del Fuego exploration team, Apache Energia Argentina, Buenos Aires. Previously senior staff exploration geologist, Apache Egypt, Cairo.

**Gabor C. Tari**, to president, AllyGabor Geoscience, Bellaire, Texas. Previously

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\*Commissioners Disability Table 2003 ©



## Alan Wegener Named To AAPG Director Post

Alan T. Wegener has assumed the position of AAPG's director of Global Development and Conventions.

His responsibilities include direction of the convention department and international and domestic outreach responsibilities.

Wegener has extensive association meeting leadership experience, having served with the Society of Petroleum Engineers from 1991-98, first as event manager and then becoming general manager for the Offshore Technology Conference and associate executive director-enterprises.



Wegener

He also was associate executive director of meetings, exhibitions and corporate services for the Instrumentation, Systems and Automation Society, and also held various marketing and sales positions with the National Association of Corrosion Engineers.

Wegener most recently was director of conference and corporate marketing manager for Noria Corp. in Tulsa and was previously director of the trade group for The Powersports Group of Advanstar Communications.

A native of Oklahoma City, Wegener holds a bachelor's degree from Oklahoma State University. □

continued from previous page

vice president-geosciences, Vanco Energy, Houston.

Larry Wickstrom has been appointed state geologist and chief of the Ohio Division of Geological Survey, Columbus, Ohio. Previously assistant chief, Ohio Division of Geological Survey, Columbus.

*(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, smooore@aapg.org; or submit directly from the AAPG Web site, www.aapg.org/explorer/pnb\_forms.cfm.)*



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**Authors are invited to submit new work for either oral or poster sessions.**

Abstracts are due **APRIL 2, 2007**.

After that date, contact **James A. Drahovzal**, Technical Program Chair, [drahovzal@uky.edu](mailto:drahovzal@uky.edu), 859-257-5500 x155

Exhibits: **Dan Wells**, Exhibits Chair, [d.wells@insightbb.com](mailto:d.wells@insightbb.com), (859) 523-3892.

Sponsorships: **Mike Sanders**, Sponsorship Chair, [msasjs@aol.com](mailto:msasjs@aol.com), (859) 266-6546.

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**Controls On Porosity Types and Distribution in Carbonate Reservoirs • May 20-25, 2007** Begins and ends in Salt Lake City, Utah. \$2,000 per person (\$100 more after 5/11/07)

**Geological Tour Through Alaska • June 2-11, 2007** Begins in Anchorage and ends in Fairbanks. \$3,295 per person (\$100 more after 4/20/07)

**Predicting Clastic Reservoirs Using Applied Sequence Stratigraphy: Understanding The Fundamental Drivers Of Basin Fill Architecture • June 9-16, 2007** Begins and ends in Salt Lake City, Utah. \$2,000 per person (\$100 more after 5/11/07)

**Folding, Thrusting And Syntectonic Sedimentation: Perspectives From Classic Localities Of The Central Pyrenees • June 11-15, 2007** Begins and ends in Barcelona, Spain. \$1,750 per person (\$100 more after 4/30/07)

**Sequence Stratigraphy And Reservoir Distribution In A Modern Carbonate Platform, Bahamas • June 11-16, 2007** Begins and ends in Miami, Florida. Includes four days + Bahamas chartered boat. \$3,600 per person (\$100 more after 4/30/07)

**Seismic Interpretation in Fold- and Thrust- Belts Using Fault-Related Folding Techniques • May 21-24, 2007** \$995 for AAPG members. \$1,095 for non-members (\$100 more after 4/23/07)

**Interpretation Of Old DST's To Find Additional Oil And Gas Potential • June 4-8, 2007** \$1,195 for AAPG members. \$1,295 for non-members (\$100 more after 5/20/07)

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## MEMBERSHIP AND 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, but places the names before the membership at large. Any information bearing on the qualifications of these candidates should be sent promptly to the Executive Committee, P.O. Box 979, Tulsa, Okla. 74101. (Names of sponsors are placed in parentheses. Reinstatements indicated do not require sponsors.)

Membership applications are available at [www.aapg.org](http://www.aapg.org), or by contacting headquarters in Tulsa.

### For Active Membership

#### Arizona

Curry, Diana, Southwestern Energy, Conway (D.C. Melton Jr., K.R. Butler, W.J. Winkelman)

#### California

Glatz, Carl W., Halliburton, Bakersfield (M.L. Wilson, L.C. Knauer, D.R. Julander); Nelson, Michael P., DCOR, Santa Paula (reinstatement) (G.J. Cavette, A.V. Lewis, G. Brown); Walton, Robert Grove Jr., Bankers Petroleum (US), Sacramento (J.M. Hill, R.G. Walton, L.C. Bortz)

#### Colorado

Beach, Mark, TICORA Geosciences, Arvada (T.J. Pratt, M.J. Mavor, R.C. Hartman); Sutton, Chris, Rosetta Resources, Denver (D.R. Robertson, B. Funderburk, C.W. Campbell)

#### Florida

Norris, Shirley (Gay), California Department of Transportation, Pensacola (reinstatement)

#### Oklahoma

Ford, David Alan, Samson Resources, Tulsa (R. Lindsay, C. Cook, R.R. Foshee); Weyland, Virginia, U.S. Department of Energy, Tulsa (R. Jacobs, T.C. Chidsey Jr., L.C. Knauer)

#### South Carolina

Nichols, Ralph L., Savannah River National Laboratory, Aiken (M.K. Harris, G.R. Baum, D.E. Wyatt)

#### Tennessee

Draper, David Gilbert Jr., Ariana Energy, Oak Ridge (D.W. Oldham, T.W. Cate, S. Gilbert)

#### Texas

Abushagur, Sulaiman A., EPCC, El Paso (reinstatement) (R. Langford); Campobello, James Samuel, Cambridge Energy Research Associates, Houston (R. Esser, M.W. Boyd, E.G. Wolter); Gobran, Meri Lynn, Nexen Petroleum U.S.A., Dallas (S.A. Hunter, R.B. Laybourne, J. Wagner); Graham, Sherry Jean, Layton Energy, Houston (T.M. Talley, J.V. Richards, M.J. Krensek); Haley, Sidney Wayne, Denbury Onshore, Plano (J.A. Mulligan, G. Roberts, C.P. Doubek); Hay, Thomas Charles, Schlumberger, Houston (K.S. Glaser, D.R. Paddock, C.H. Wagner); Kuhl, Eric John, Newfield Exploration, Houston (J.M. Austin, G.F. Craddock, R.G. Richey); Leavitt, Aaron John, Oxy USA, Houston (L.B. Prothro, T.B. Beserra, P.K. Hae Hae); Pelletier Tardy, Isabelle, Schlumberger, Houston (S. Claude, D. McCormick, H. L. Buscher); Potluri, Naga K., DeGolyer and MacNaughton, Dallas (C. Jenkins, D.E. Thomas, R.S. Tye); Tuttle, Scotty L., Petrohawk Energy, Houston (J.F. Mallick, M.D. Jones, J.W. Brown)

continued on next page

### Certification

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

#### Petroleum Geologist

##### Michigan

Cecil, Thomas M., Wolverine Gas and Oil Corp., Grand Rapids (reinstatement)

##### Texas

Donaghey, Calvin Wayne, GeoSurveys Inc., Abilene (R.C. LaSeur, D.R. Duncan, B. Salters)

##### Pakistan

Waheed, Abdul, Saif Energy, Islamabad (M.H. Channa, M.U. Chaudhry, A.S.H. Zaman)



### 2007 COURSES

<ul style="list-style-type: none"> <li>• <b>Deepwater Clastics</b></li> <li>• August 6-8, 2007</li> <li>• Durango, Colorado</li> <li>• \$1,200.00 per person</li> <li>• Includes tuition, course notes, CD and lunches</li> </ul> <p style="text-align: center;"><i>Details &amp; registration:</i> <a href="http://www.cosseygeo.com">www.cosseygeo.com</a> or email: <a href="mailto:cosseygeo@aol.com">cosseygeo@aol.com</a> or call +1 (970) 385 4800</p>	<ul style="list-style-type: none"> <li>• <b>Deepwater Reservoirs: An Integrated Course and Field Seminar</b></li> <li>• October 8-12, 2007</li> <li>• Tabernas and Sorbas Basins, Spain</li> <li>• \$2,800.00 per person</li> <li>• Includes tuition, guidebook, ground transport, some meals</li> </ul>
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**INMEMORY**

**Athens Conference Technical Co-Chair Dies Suddenly**

Bjørn Wandås, who last fall was named technical program co-chair for the upcoming European Region Energy Conference and Exhibition in Athens, Greece, died suddenly March 3 while on a ski vacation. He was 54.

Wandås, who was skiing with his wife, Bjørg, in Etnedal, Norway, reportedly fell down and could not be revived.

Wandås recently was involved in the creation of a new oil company, Vienco HS, in Asker, Norway, after a career spent with the Norwegian Petroleum Directorate, Saga Petroleum, Neste/Fortum Petroleum and Eni.

He was an author and recognized expert on the Norwegian Continental Shelf, and is credited with being a major factor in the discovery of the Goliath Field offshore northern Norway.

His technical program co-chair, Vlastimila ("Vlasta") Dvorakova, of Brno, Czech Republic, will continue to head the meeting's technical program.

The Athens conference, the first joint venture between AAPG and the AAPG European Region, will be held Nov. 18-21. The technical program's theme is "Challenge Our Myths."

\* \* \*

William Leroy Adams, 77  
Fort Worth, Feb. 12, 2007

William L. Barksdale, 84  
Greenwood Village, Colo.  
Jan. 18, 2007

Douglas Darling Hastings, 85  
Lafayette, Calif., Jan. 26, 2007

Erwin Frank Pesek (AC '53)  
Dallas

John Lewis Ponder, 86  
Midland, Texas, Feb. 7, 2007

Bernard Radovsky, 83  
San Diego, Feb. 12, 2007

Gene Anthony Radzewicz, 56  
Natchez, Miss., Jan. 2, 2007

Harvey Stein, 86  
Cleveland, Ohio, Sept. 27, 2006

Bjørn Wandås, 54  
Asker, Norway, March 3, 2007

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

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**Angola**

Twaddle, Donald Allan, Sonangol P&P, Luanda (B. Groeneweg, T. Koning, G.L. Stewart)

**Australia**

Ferdinando, Darren David, ARC Energy, West Perth (J.D. Gorter, C.A. Lambert, B.J. Warris); Lennane, Michael Roalfe, Murphy Oil Sabah, Perth (J.V.C. Howes, D. Poynton, R. Weeden); Payenberg, Tobias, Adelaide University, Adelaide (J. Kaldi, R.R. Hillis, S.C. Lang)

**Brunei Darussalam**

Arochukwu, Elias Chukwu, Brunei Shell Petroleum, Seria (H. Darman, O.A. Fatoke, A.D. Parker)

**England**

Bernaus, Josep M., Statoil ASA, Cheltenham (M. Tucker, N. Laker, C. Toland); Jones, Stephen P., X-Ray Mineral Services, Colwyn Bay, N. Wales (A. Butcher, B.T. Wells, A.C. Barnwell); Ossai, Okechukwu Peter, Jefferies Randall & Dewey, Hounslow (D. Mitchell, I.P. Wright, J. Redfern)

**Indonesia**

Sani, Kartono, EDI Bambang Setyobudi, Jakarta Selatan (C.A. Caughey, A. Kohar, R.J. Deakins)

**Korea**

Lee, Tae-Gook, Korea National Oil, Anyang, Gyeonggi-do (I. Cho, S. Park, Y. Kil)

**Netherlands**

Otto, Claus, Shell International, Rijswijk (D.N. Dewhurst, J.R. Underschultz, M. Lisk); van der Meer, Douwe George, Shell E&P, Delft (J.F. Karlo, S.A. Meyer, M.A. Doyle)

**New Zealand**

Mills, Carey Richard, Austral Pacific Energy, Wellington (J.M. Beggs, T.G. Russell, C. McKeown)

**Nigeria**

Enemuoh, Anyaegbuna Emmanuel, Nigerian National Petroleum, Benin City (H.M. Aliyu, E.G. Odior, V.F. Agbe-Davies); Isibor, Dennis Osahon, Nigerian AGIP Oil, Port Harcourt (N.R. Ndim, A.A. Carim, B. Olaleye)

**People's Republic of China**

Guo, Li, Sinochem, Beijing (T. Fan, Y. Meng, C. Lin); Jiang, Shu, University of Colorado at Boulder, Beijing (P. Weimer, S. Li, C. Lin)

**Russia**

Lopatin, Alexander Yurevich, Halliburton/Landmark, Moscow (J.C. Dolson, A. Medvedev, C.R. Handford)

**Saudi Arabia**

Rawasia, Muhammad Shoaib, Saudi Aramco Oil, Dhahran (J. Melvin, G.P. Grover, C. Heine); Titley, Paul A., Saudi Aramco, Dhahran (S.A. Al-Hajri, A.M. Afifi, A.K. Norton)

**United Arab Emirates**

Bauer, Jan, Badley Ashton & Associates, Abu Dhabi (D.F. Payne, D.M. Bliefnick, M. Ashton)

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## READERS' FORUM

### Graduated Dues

Regarding the proposed graduated dues structure: I strongly support this proposal and I hope that it passes at the House of Delegates. Other competing societies have done something like this, and this proposal should enable us to attract more overseas members and at the same time provide them with more choice.

Chris Heath  
Vancouver, B.C.

*(Editor's note: Heath has conducted multiple membership-related surveys on AAPG's behalf, including a 2006 study on stagnant AAPG membership growth, which was reported in the April 2006 EXPLORER.)*

*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.*

### Wanted: An Academic Rate

Regarding the dues structure for AAPG: I'd like to see an academic rate for faculty.

With the new dues proposal (which was voted on by the House of Delegates at its annual meeting in Long Beach, Calif.), a faculty member making a modest salary slightly above the \$50k boundary is paying the same amount as someone in industry making a hefty six-figure salary.

Most AAPG members buy memberships for the journal access, but

faculty members don't "need" the personal access since they can already access journals via the library. With the graduated dues, faculty pay a disproportionate amount in regard to their ability to pay compared to the vast majority of petroleum geologists.

Perhaps industry members making significantly large salaries might be willing to help subsidize more and receive recognition in the AAPG EXPLORER.

More faculty involvement via a reduced academic rate can increase

communication, heighten awareness and, ultimately, help AAPG increase student participation.

An academic rate can be an investment in AAPG's future.

Marjorie Chan  
Salt Lake City

### Cause and Effect

Our planet seems to be warming, but why?

Our *World Book Encyclopedia* of 1966, Volume A, page 153, gives the percentages of gases in our air as follows: nitrogen – 78 percent; oxygen – 21 percent; and Aragon – .93 percent, for a total of 99.93 percent of the air. The remaining .07 percent includes as listed: neon, helium, krypton, xenon, hydrogen, ozone, carbon dioxide, nitrous oxide and methane.

On page 167 of Volume C it lists carbon dioxide as making up three ten-thousandths, or .03 percent by volume of the air. A recent *National Geographic* magazine states that carbon dioxide makes up 378 parts per million, or .0378 percent of the air.

And such a small increase in such a very small percentage of a gas is supposed to control the climate of the earth?

Better look for other causes!

Pardon me, but to this little boy geologist (77 years old), standing on the sidelines, it appears that the emperor has no clothes on, or at least only .0378 percent of his clothes.

Dale Maxwell Holyoak  
Wichita, Kan.

### Leave It to Them

Regarding the recent discussions of the AAPG policy on climate change:

My strong recommendation is that AAPG avoid forming an opinion on the matter of human induced climate change. Rather, if we are truly a professional body that recognizes scientific principles, we should accept that the views of the National Academy of Sciences, National Academy of Engineering, Institute of Medicine and National Research Council are likely to be better informed than our own points of view.

Their latest report to the White House includes the following statement:

"Changes observed over the last several decades are likely mostly due to human activities, with some contribution from natural variability."

That is not to say that the Academies are correct; it's just that those bodies are throwing massive investigative weight behind one of the largest collective scientific studies ever undertaken by the human race. AAPG might appear to be defending a position for less than scientific reasons under such obvious conditions of conflict of interest.

Would we accept an alcoholic's claim: "It's not the drink that's at fault, I act like this all the time"? His obvious conflict of interest breeds suspicion even though his assertion may be correct.

If AAPG has integrity of the highest order it will accept the obvious conflict of interest on our position on global warming and put the resolution of this highly important question into the hands of climate experts, past and present, and not petroleum experts. The stakes are far too high and our reputation is too valuable.

Brad Ilg  
Lower Hutt, New Zealand

### Communication Differences

Wireless cellular seismic acquisition systems are often compared with mobile

continued on next page

## How Can Petroleum Companies Make Better Decisions?



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continued from previous page

phones. This comparison is very convenient to explain how they function, as Bob Hardage did in the EXPLORER's February Geophysical Corner ("Hello, This is Your Geophone Calling").

However, this may disguise differences in the implementation of both systems.

For telecommunications, the provider makes large investments in the infrastructure, including expensive antennas whose locations are determined from detailed site surveys. This makes it possible to lower the price of the mobile phones. Whereas, the seismic contractor needs to provide both the mobile seismic receivers (remote acquisition units, or RAUs) and an infrastructure that can be moved to different survey areas as well.

The contractor and its seismic equipment provider, therefore, are obliged to include more capabilities within each RAU to decrease the cost of the infrastructure. Thus, the price of a RAU will be much more than that of a mobile phone.

As an example, a GPS and its antenna are included in each RAU while they are not in the mobile phone. The main purpose of the GPS is to precisely time stamp the seismic samples and to synchronize the whole acquisition system with respect to a common reference time (UTC).

Another potential application is GPS positioning of the RAU location; this positioning, however, is often performed with an external and more sophisticated GPS that functions in differential mode to more easily attain the requested accuracy for seismic acquisition.

An additional difference with mobile phones is related to the size and

specifications of the flash memory. It must be of sufficient capacity to store several hours (or even days) of seismic data. It must also function over a wide range of temperatures (-40 degrees to +70 degrees Celsius) to conform to the difficult expected operating conditions in which seismic crews work.

Large computing capabilities (CPU) are also included in the RAU, not only for digitizing the analog data coming from the geophones, but also to filter or stack shot points.

It is worth noting that some wireless seismic systems are ahead of conventional cell phones, since they use Wifi technologies to transfer quality control information and seismic data to the central recording unit. This has been implemented in the field for three years while Wifi-ready mobile phones that enable free calling and Web browsing are just entering the market.

Denis Mougenot  
Carquefou Cedex, France

#### Geology's Importance

Michel Bechtel's thrust on understanding subsurface geology is correct ("Strategies Glean New Prospects," February EXPLORER): Our understanding and information about any particular region is most reliable and authentic in well control areas.

By comparing geological and engineering characteristics and their combined seismic attributes in well-controlled areas, such seismic attributes can be traced to infer geological and engineering information to explore and generate new compartments having hydrocarbons.

Seismic must be calibrated with other available data.

Vinay K. Sahay  
Bombay, India

## CLASSIFIED ADS

### POSITION AVAILABLE

#### STRUCTURAL GEOLOGY/TECTONICS SCHOOL OF GEOLOGY AND GEOPHYSICS COLLEGE OF EARTH AND ENERGY UNIVERSITY OF OKLAHOMA

The University of Oklahoma invites applications and nominations for a tenure-track or tenured faculty position in Structural Geology/Tectonics.

The holder of this position is expected to (1) conduct research in structural analysis using any combination of theoretical, experimental, field and seismic approaches; and (2) educate students in the area of structural concepts and techniques.

The University is seeking to fill this position at the Professor level. The successful candidate should have a demonstrated excellent research record and the vision to establish a strong research program in pure and/or applied structural geology/tectonics. Research experience and expertise in the area of fracture and fault analysis is preferred. The candidate must also be an excellent educator, with commitment to both the undergraduate and graduate (M.S. and Ph.D.) education. A Ph.D. degree is required for this position. Salary and benefits will be competitive and commensurate with experience and future potential.

Initial screening of applicants will begin in late Spring 2007. The position will be available as early as Fall 2007, and the search will remain open until the position is filled. Applicants are encouraged to submit a complete vita/resume, statement of research and teaching interests, and a list of five references, including names, phone numbers, e-mail addresses, and complete mailing addresses. Questions or requests for additional information may be addressed to Dr. Paul Philp, Chair of the

Structural Geology/Tectonics Search Committee. Applications and nominations should be addressed to:

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University of Oklahoma  
Sarkeys Energy Center  
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Norman, OK 73019-1008

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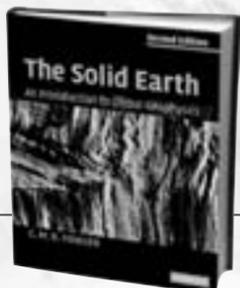
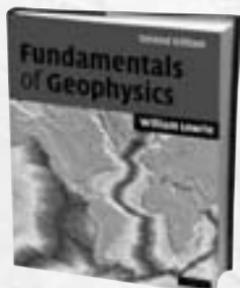
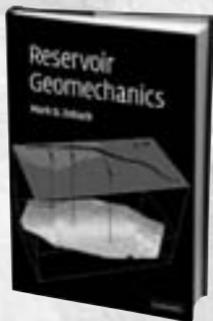
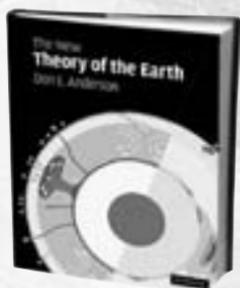
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See **Classifieds**, next page

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**Classifieds**

from previous page

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**DIRECTOR'S CORNER**

# Dissemination: It's What We Do

By RICK FRITZ

Dissemination of information is the *prime directive* for AAPG – and by the time you read this column, AAPG will be in the middle of or just past our greatest period of “dissemination” for the year.

Nearly 1,000 oral and poster presentations were scheduled for our annual convention in Long Beach, Calif.

I remember just before I gave my first technical talk over 20 years ago I was told to “finish talking before the audience stopped listening.” It was good advice.

I also remember reading statistics that indicated people's number one fear is *public speaking*; our number two fear was *dying*.

I guess that means if you are attending a funeral that most people in the service would rather be in the casket than give the eulogy!

(Perhaps not – that may be taking statistics too literally.)

Literally speaking, however, we have a lot of good speakers at each meeting and we appreciate their efforts and bravery in giving talks.

\* \* \*

AAPG “orators” have a lot to say and cause a lot of listeners to *think*. The key goal for us is capturing those ideas so they can be disseminated to the membership – most of these require the skill of writing.

Of course, the BULLETIN and the EXPLORER are the two primary conduits. This month, for example, the BULLETIN is a special issue on the

*AAPG “orators” have a lot to say and cause a lot of listeners to think.*

Barnett shale (a subject you'll also find discussed on page 18 of this very EXPLORER). It took a lot of time and effort by numerous writers and staff to produce this volume.

We are constantly looking for new papers for the BULLETIN, so I encourage members to write when you have something you think is technically important to say.

If you just have something important to say, non-technical, I *still* encourage you to write us – we always are willing to listen. If it is a letter to the editor we will try to get it into the EXPLORER.

AAPG also has dedicated a number of new associated editors to find and develop more E&P Notes. These are popular “writings” for many of our members, and we want to make sure we expand this series and develop a good global supply of these articles.

\* \* \*

A newer method for dissemination is *Search and Discovery*. This does not necessarily involve writing. We encourage all of the presenters – poster or oral – at the annual meeting, and all of our meetings for that matter, to place your electronic presentations on AAPG's

e-magazine. Sometimes we may ask you to write a few notes to go with especially, but it is not a requirement.

*Search and Discovery* has become an important point of dissemination for AAPG to members and the general public. Last year, we had over 1,139 million individual “sessions” on this Web-based product.

\* \* \*

Of course, another major area for dissemination of information for AAPG is our special publications, or “special pubs.”

No, AAPG does not own a series of public houses – special publications are truly special topical and/geographical writings of new work by a few authors, or compilations of work by many authors.

To date AAPG, through its rich “writers” base, has developed over 250 special publications.

Edward Schlossberg, a cultural historian, said that “the goal in writing is to have the skill to create a context in which people can think.” What a great quote!

That is AAPG's ultimate goal.

\* \* \*

Since I have been encouraging people to write for so many years, last year I decided I should help with a special pub. Before I became AAPG Executive Director, Dr. James Lee Wilson – “Jim,” to all his carbonate friends – and I decided to develop a special publication titled “Cambro-Ordovician Sauk Sequence – The Geology and Petroleum Potential of the Great American Carbonate Bank.”

We let it sit for a while (we were trying to think of a longer title), but finally last year we enlisted Jim Derby and Bill Morgan to become editors of the project with a “cast of thousands” contributing to the project – some of the best workers in the Cambro-Ordovician.

Jim Wilson is the senior editor, and the project is starting to pick up steam.

The evolution of a special publication is an interesting process – it takes a lot of patience.

I have to admit it is a lot of work, but also it is a lot of fun. The key thing is dedicating the personal time to work on it.

If you have knowledge to “disseminate,” or if you can be part of an editorial team, I encourage you to take the time to contribute.

It's not only personally rewarding, it is rewarding to your profession.



## Professional Initiatives on Agenda

# Activities Accelerating for DPA

By RICHARD G. GREEN

Because of publication deadlines I am writing this column in early March, knowing it will be published soon after the Annual Convention in Long Beach. We have had a good – and busy – fall and winter that include:

✓ Editor Bob Shoup publishing an excellent and thought-provoking *DPA Correlator*. I hope you have read the articles and the editorials.

✓ We held elections for Advisory Council representatives for next year and are in the midst of our elections for our next Executive Committee with a very strong slate of candidates.

✓ At our winter mid-year meeting in Dallas, an effort headed by George Bole to recognize our founding members was launched. DPA sent out letters of recognition and a pen to these fine members and it has been my pleasure to hear from many of these fine supporters of DPA.

✓ We also have sent letters to the members of AAPG who are registered in Texas but not certified, and I have approved a good number of new applicants – and some reinstatements – to DPA, all forwarded to me by Royce Carr and his very fine committee.

✓ We have approved our first group of Board Certified geoscientists and have approved the form for recording CEU's online.

All of this should continue to keep our

organization strong and financially sound into the future.

\* \* \*

The advisory council will meet in Long Beach, discuss several important issues and try to come to a consensus. I will discuss several of these here:

□ One agenda item is formalizing the processes for development, approval and review of our AAPG Position Papers.

As many of you realize, these are generally formulated in the DPA Government Affairs Committee (GAC); an author or authors are suggested and asked to prepare positions while researching the topic. The GAC then reviews and edits, and then the position is presented to the DPA president and the Advisory Council for DPA approval. The document is only then submitted to the Executive Committee or other divisions for approval or revision.

This process results in thoroughly vetted positions that certainly can be dated by the time this lengthy process is completed. We intend to codify the described process and then a periodic review of our accepted positions so that dated material can be freshened.

Many of our past positions are in response to specific government actions or proposed actions, and the political climate or proposed legislative agendas



do change necessitating our periodic review. DPA president-elect Thomas Ewing has made a good start on a draft version of our procedures, which we will vote on as a group prior to forwarding to the AAPG president.

□ We also will review the ongoing efforts at joint society cooperation to develop training for reserve evaluators with a report by Dan Tearpock.

This important effort with the WPC, SPE, SPEE and others is designed to improve the reporting of reserves in all reporting systems and countries by improving the skills and training of the evaluator. We have a Washington, D.C., meeting set in late June (see page 35) to publicize these initiatives to government and the public.

DPA also will be well represented in late April in Washington at Congressional Visit Days; Don Juckett has been organizing this event and meetings with congressional

staff and representatives for our DPA and AAPG delegation.

Much of the legislation proposed this year is punitive and misguided (as predicted last fall), and our effort is to educate these policymakers about our science and industry. The real “Inconvenient Truth” is that only in a climate of ignorance and fear can some of this legislation be approved and we must try to educate those who will listen.

\* \* \*

This is my last column and I must thank Divisions manager Norma Newby for all her efforts, support and friendship this year. Norma makes anyone who holds office look good through her tireless work on our behalf.

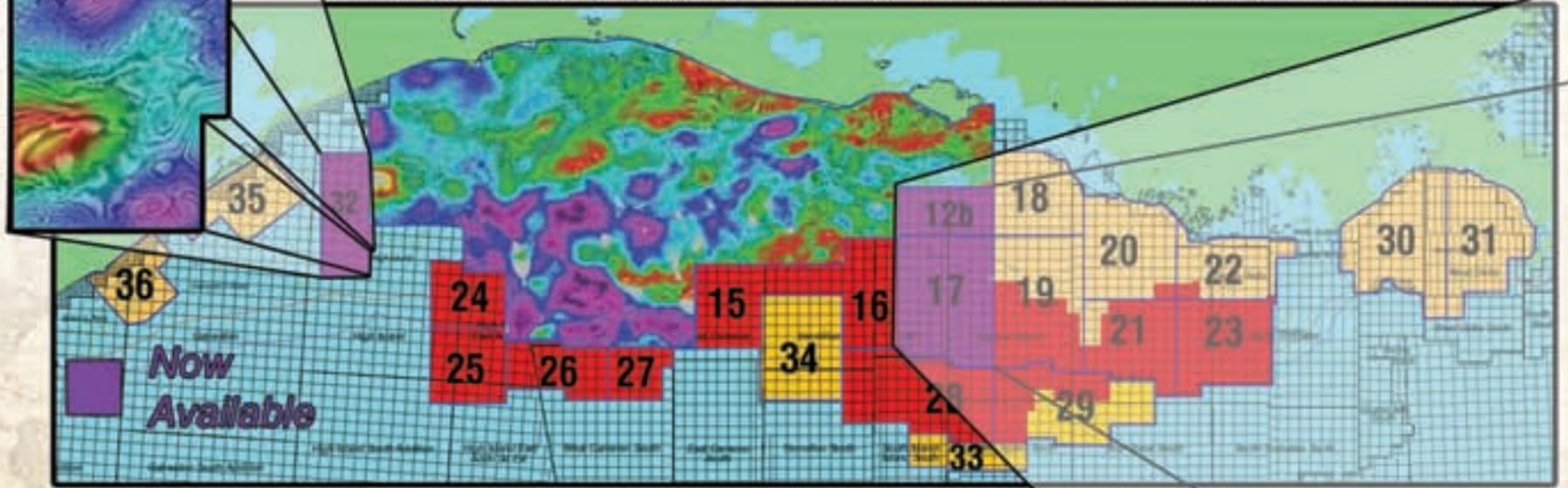
It has been an honor to be your president for this year and I have enjoyed working with so many good and hard working volunteers who keep the DPA and AAPG strong.

DPA is the reason many of us belong to AAPG and I appreciate all of you who keep us moving forward. AAPG and DPA are filled with individuals and scientists of high integrity and intellect but radically varying political opinions and views.

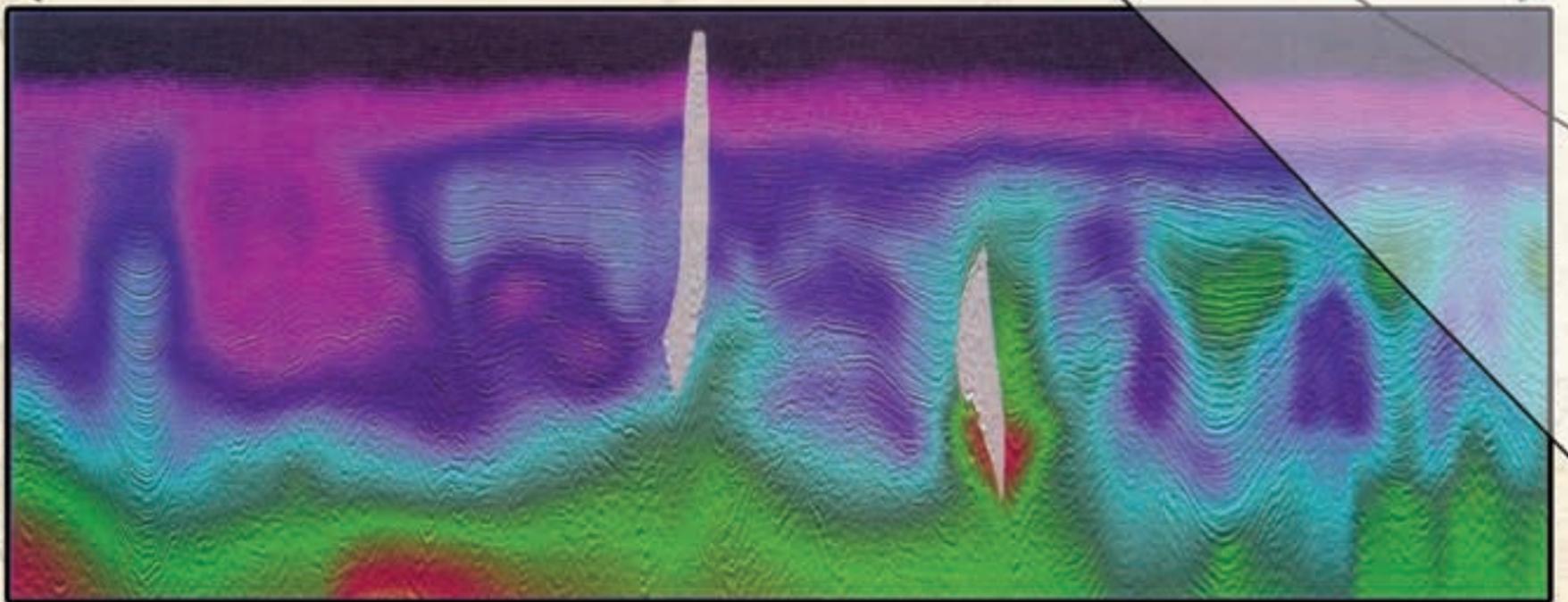
I hope we all remain committed to defending our science and the oil and gas extraction industry against those who would weaken or destroy what has served mankind well. □

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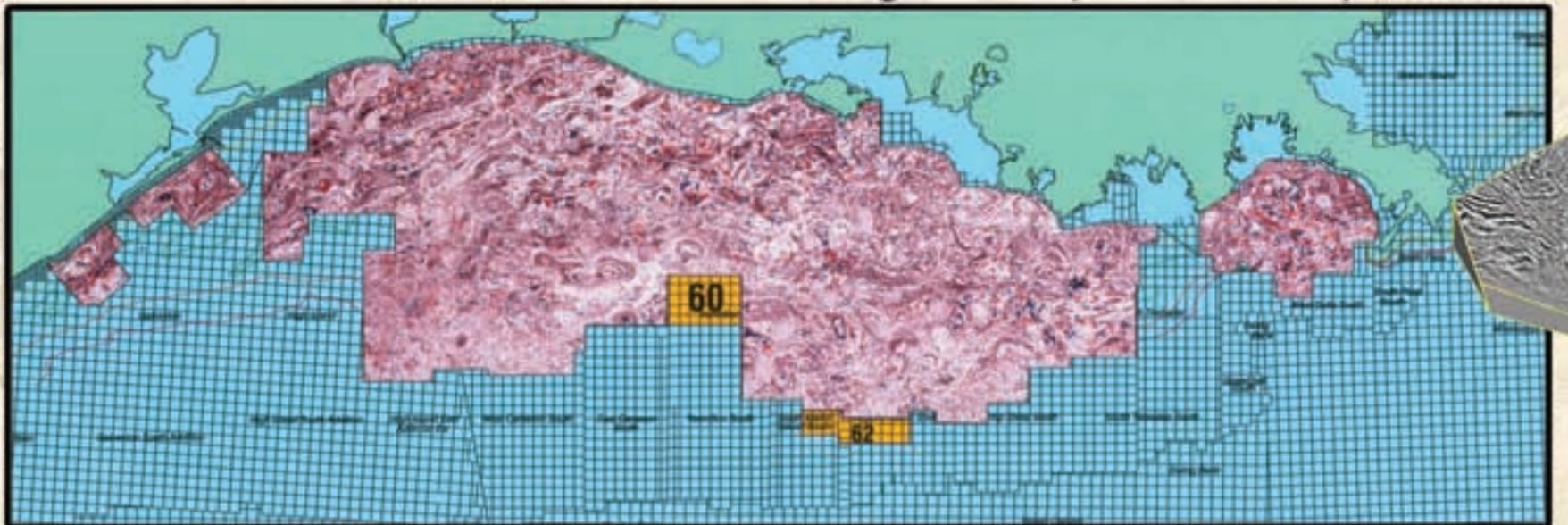
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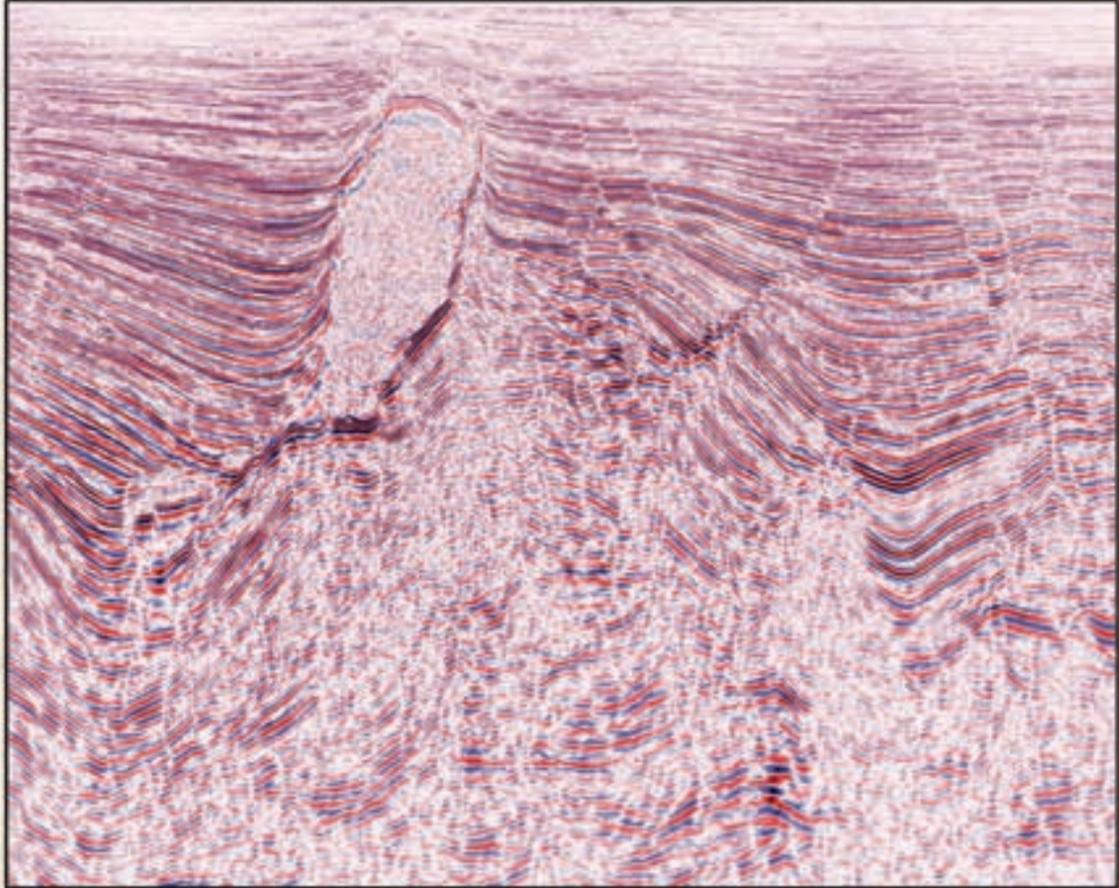
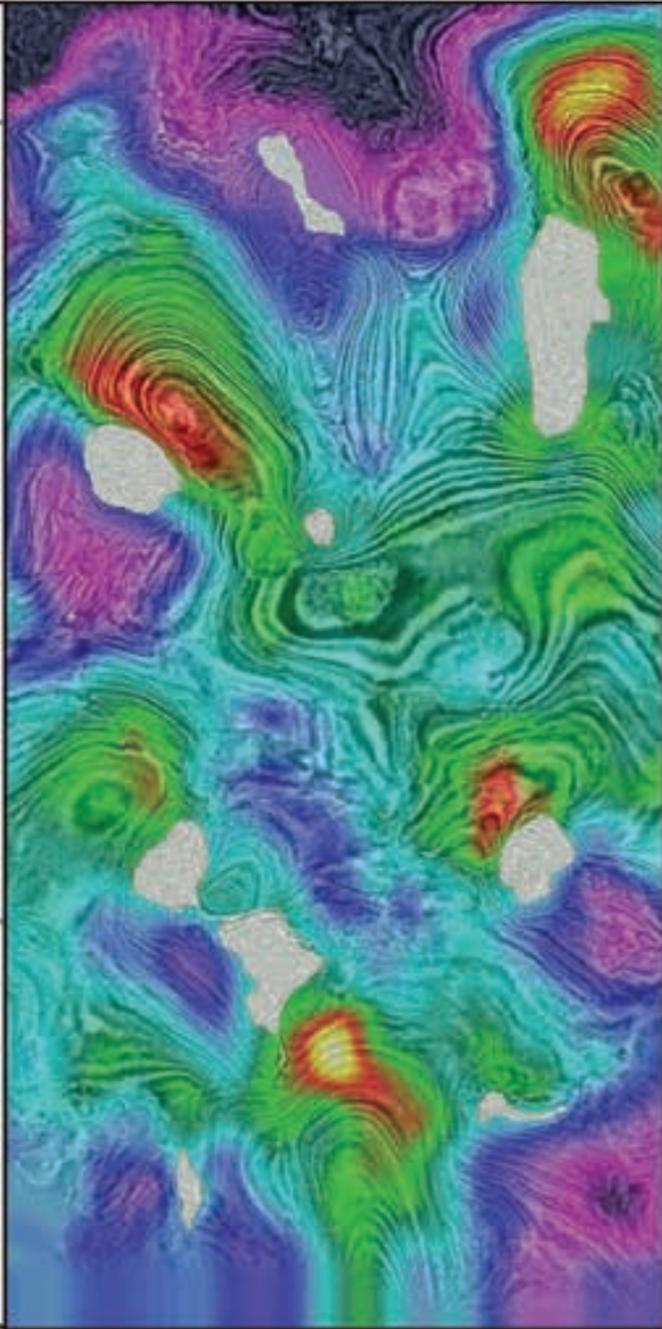
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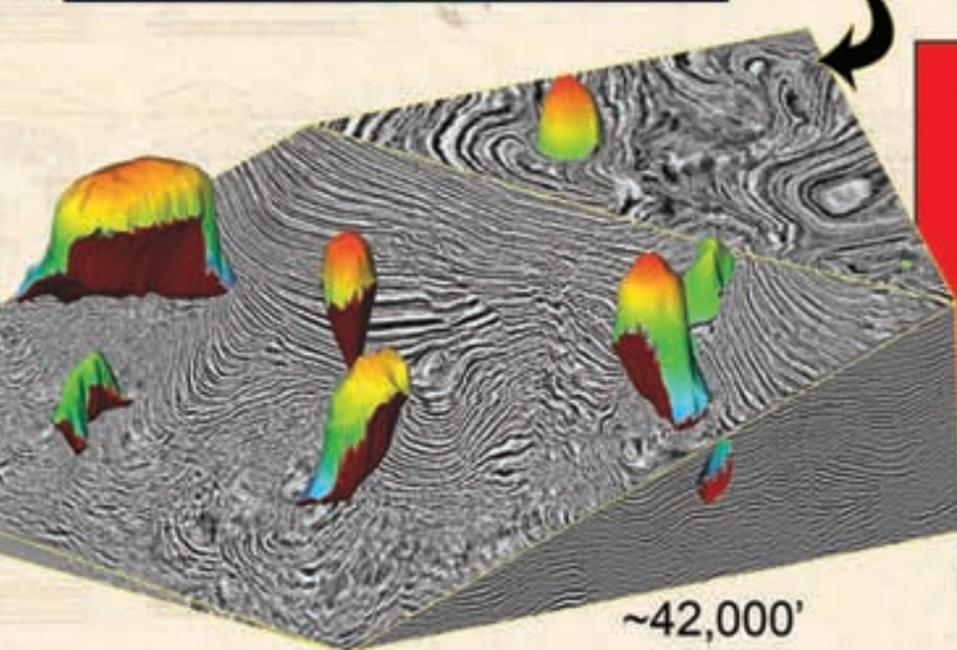


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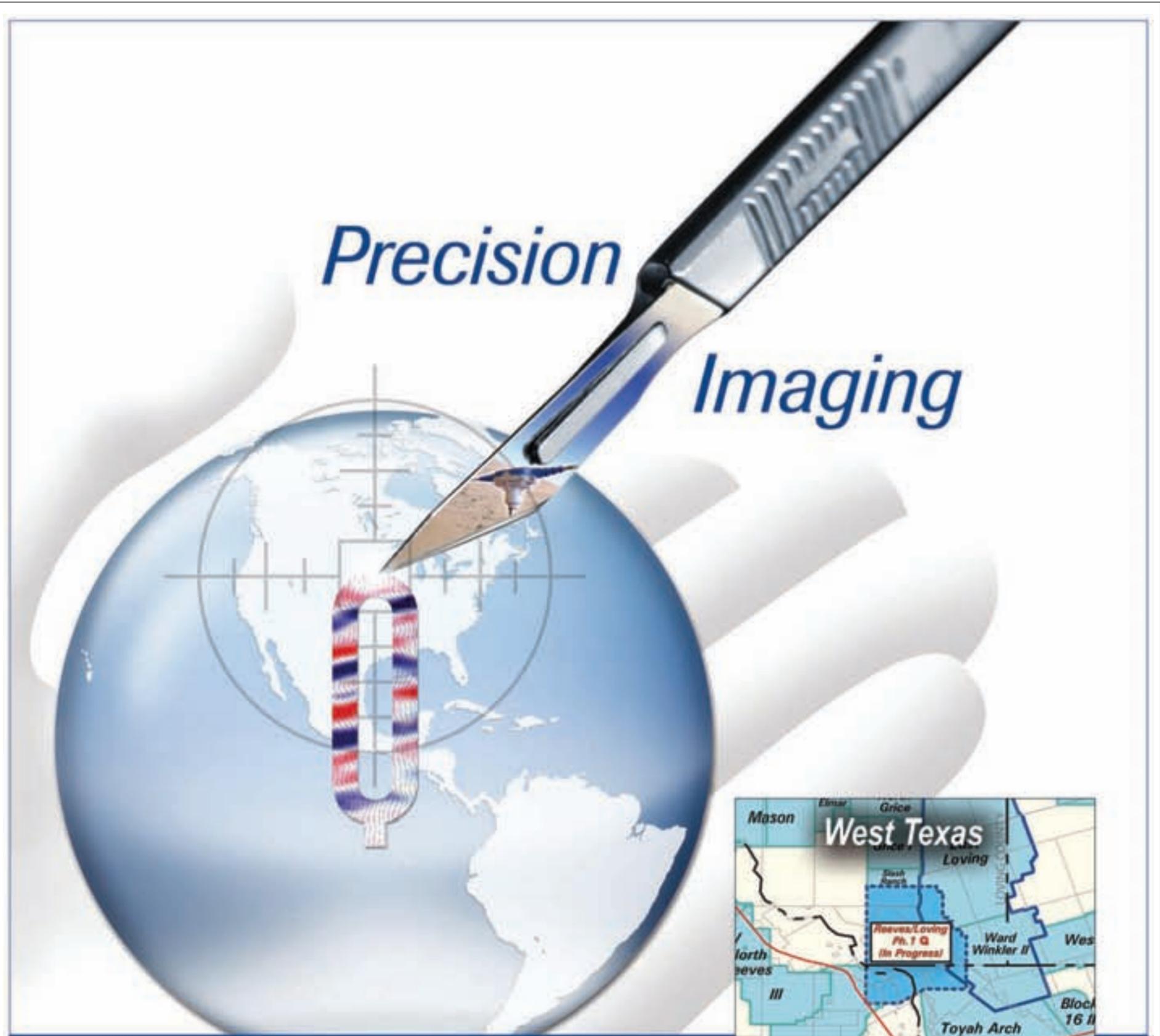
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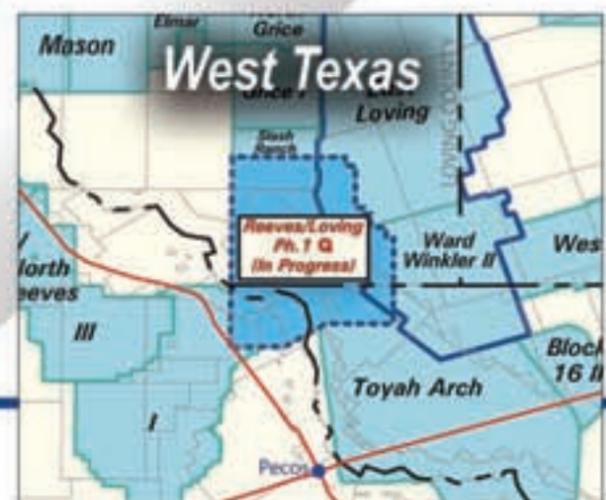


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