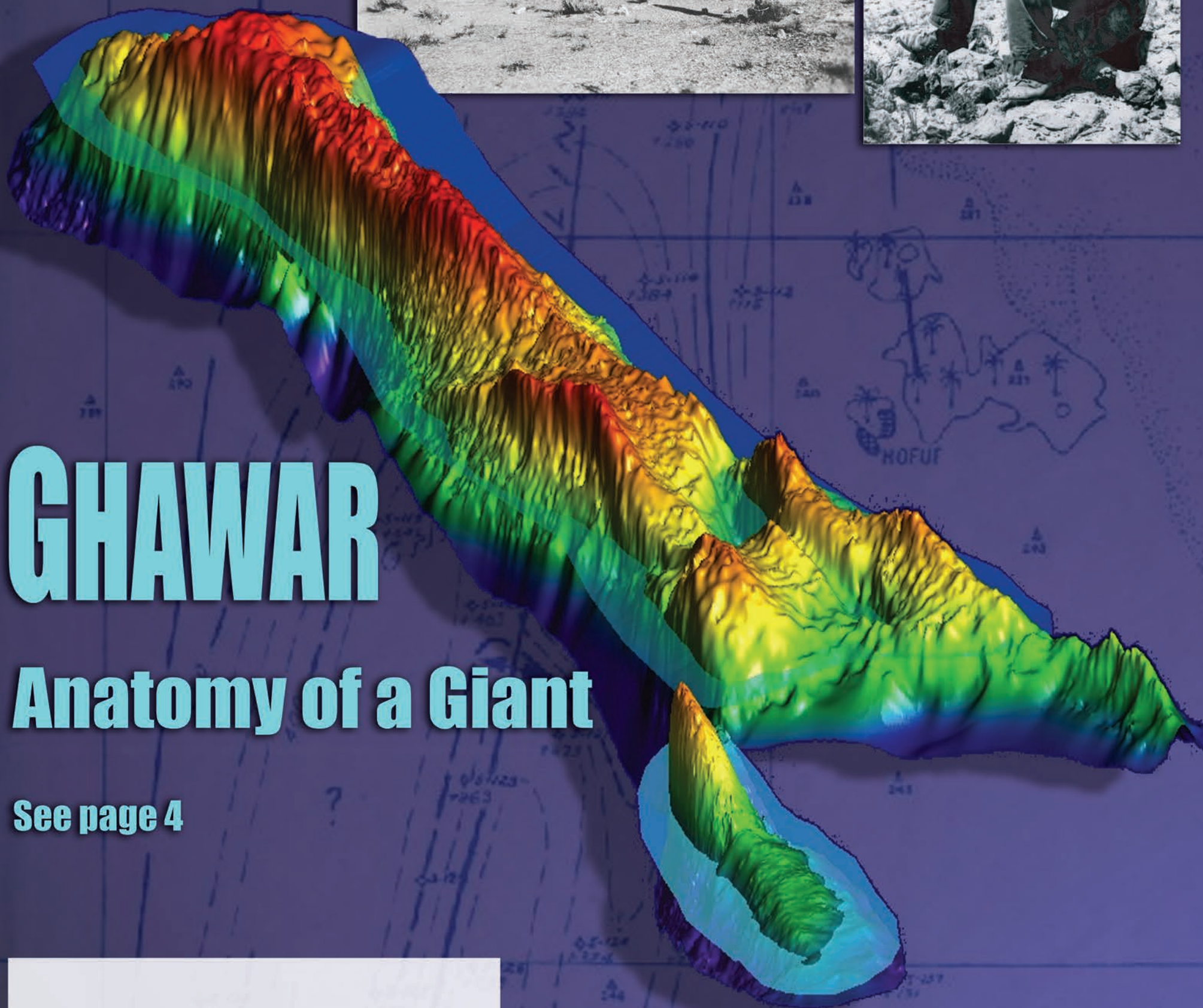
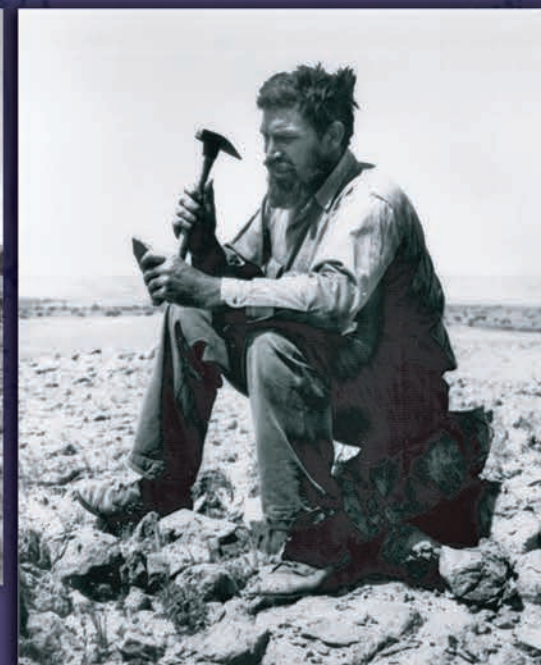


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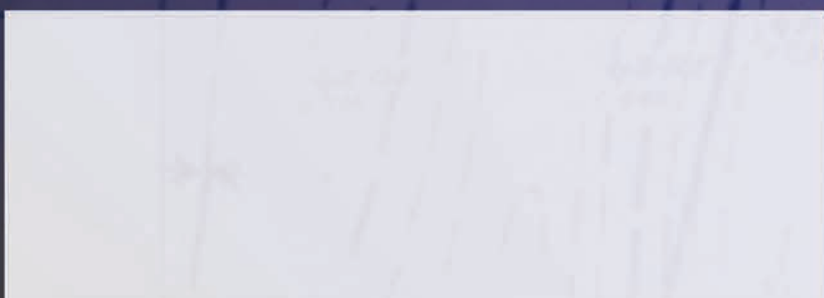
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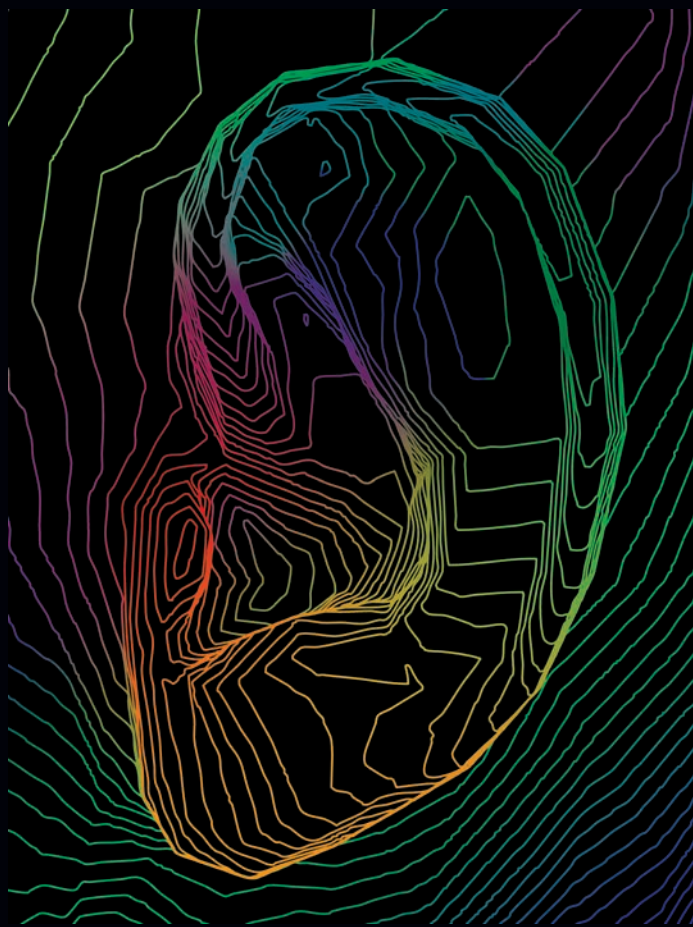


GHAWAR

Anatomy of a Giant

See page 4





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On the cover: Saudi Arabia's giant Ghawar Field, the world's largest oil field, was the subject of a special AAPG Distinguished Lecture tour this year and is examined in the lead-off story in our annual World Developments issue. Pictured atop an early structure map of the region is the Jurassic Arab-D carbonate reservoir, which contains the world's largest oil reserves due to the combination of large structure, prolific source, excellent reservoir quality and an effective anhydrite seal. Production is about 5 million bod under peripheral water drive. Also pictured are the geologists who first mapped the area, including the legendary Max Steineke, an AAPG Powers medalist. Photos, graphics courtesy of Saudi Aramco.

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Alaska is a land with beautiful glaciers – and, unfortunately, that seems to symbolize the pace of the state's oil and gas development. **8**

Wildcats, yes, elephants, no: A revealing snapshot look back at the **top global discoveries** for 2004 may help answer the question of what our oil future will be – and from where our energy may come. **10**

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Vol. 26, No. 1
The AAPG EXPLORER (ISSN 0195-2986) is published monthly for members. Published at AAPG headquarters, 1444 S. Boulder Ave., P.O. Box 979, Tulsa, Okla. 74101, (918) 584-2555. e-mail address: postmaster@aapg.org
Periodicals postage paid at Tulsa, Okla., and at additional mailing offices. Printed in the U.S.A.
Note to members: \$6 of annual dues pays for one year's subscription to the EXPLORER. Airmail service for members: \$45. Subscription rates for non-members: \$63 for 12 issues; add \$67 for airmail service. Advertising rates: Contact Brenda Merideth, AAPG headquarters. Subscriptions: Contact Veta McCoy, AAPG headquarters. Unsolicited manuscripts, photographs and videos must be accompanied by a stamped, self-addressed envelope to ensure return.

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POSTMASTER: Please send address changes to AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101.
Canada Publication Number 40046336.
Canadian returns to: Station A, P.O. Box 54, Windsor, Ontario N9A 6J5

Candidate Bios, Statements Available In This EXPLORER

Complete biographical information and statements from all AAPG officer candidates for 2005-06 can be found in a special insert between pages 14-15 of this EXPLORER.

The president-elect winner will serve as AAPG president in 2006-07. The vice president will serve for the 2005-06 term, and the secretary will serve for 2005-07.

The same information remains available on the AAPG Web page (www.aapg.org), where members also can vote electronically.

The candidates are:

☐ For president-elect, **Thomas Ahlbrandt**, U.S. Geological Survey, Denver; and **Lee Billingsley**, Abraxas Petroleum, San Antonio.

☐ For vice president, **Douglas G. Patchen**, West Virginia Geological Survey, Morgantown, W.Va.; and **Steven L. Veal**, DCX Resources, Denver.

☐ For secretary, **John R. Hogg**, EnCana Corp., Calgary, Canada; and **J. Michael Party**, Wagner & Brown Ltd., Midland, Texas.

PRESIDENT'S COLUMN

Giving Thanks And Having Hope

By PATRICK J.F. GRATTON

The end of 2004 and the start of a new year are joined with giving thanks and hoping for improvement. (It is also usually a time for accounting, financial and operational, but AAPG's fiscal year doesn't end until June 30, so we'll address that later.)

Thanks to the greater AAPG community for your support and willingness to labor, mostly in committees.

Thanks to the leaders who chair those committees and who work as officers of our divisions, sections, regions, House of Delegates, affiliated societies, etc. The number of volunteers currently engaged in these activities is over 1,000, but probably less than 5 percent of the total AAPG membership.

Thanks also are due our paid staff, which totals close to 5 percent of the current active volunteers (i.e., 5 percent of 5 percent!).

Together, volunteers and staff are like bricks and mortar. It takes a lot of bricks to build a meaningful structure, but it also requires a little mortar – without which the structure cannot stand very long.

And thanks to those who are not currently volunteering in the roles identified above but who have written geoscience papers, given talks, visited schools, contributed to the Foundation, attended conventions, mentored young geoscientists, served before, may serve later and all of you who have paid dues (or had someone pay for you!).

Collectively, we are an important part of the Geotribe, with the joining of many clans (e.g., paleo, petrophysics, geophysics, etc.). Give thanks that our tribe has a base in science and another base in art (representational, abstract, performing, etc.).

I believe we all are lucky to be members of this tribe, which has no national boundaries.

* * *

Hope is for a future as rewarding as our past.

Of course, "rewarding" is a stretch when earth-derived commodities are priced low and our members' livelihoods are threatened. It is small solace to know that so many of our members have had the strength to endure (along with their



Gratton

supportive families) the agony and pain of unemployment and underemployment, depletion of capital, undesired relocation, etc. But it is becoming a mark of our tribe that so many of us are survivors (it just took TV a long time to find value in such character).

We hope to build on the past – and we anticipate greater compensation for our efforts as worldwide economic shifts place greater value on discovery and recovery of earth resources.

The Geotribe has proven itself very adaptable – and this trait will be tested as we move down the resource pyramid (That's triangle for two dimensions; time for third dimension, as past president Steve Sonnenberg has made clear!).

Hope is manifested many ways:
✓ The recent Cancun international meeting was very well attended and received high grades from attendees (December EXPLORER).

✓ Our annual meeting in Calgary (June 19-22) has had a fantastically large number of abstracts submitted.

✓ Worldwide drilling activity has increased about 10 percent (recent month-to-month, 2004 vs. 2003).

Although working seismic crews have not participated in the rising petrostatistics, increased focus on recovery vs. discovery technology may explain that and simply shift the focus of hope a little.

* * *

This giving thanks and having hope is not to trivialize the greater picture and its relationship to individual belief systems. But as president of AAPG, I think this column should have a narrower field.

Próspero Año Nuevo!

Saudi Arabia's Ghawar Field

The Elephant of All Elephants

By LOUISE S. DURHAM
EXPLORER Correspondent

Among the many prolific oil fields in the Middle East, the giant Ghawar field in Saudi Arabia stands out as the crown jewel.

Discovered in 1948, Ghawar is the world's biggest oil field, stretching 174 miles in length and 16 miles across to encompass 1.3 million acres.

Current estimates, according to the numerous published articles and reports on Ghawar, tag cumulative oil production from this geological giant at 55 billion barrels, and the field just keeps going gangbusters. Average production for the last 10 years has held essentially steady at five million barrels per day.

In fact, this one field accounts for more than one-half of all oil production in Saudi Arabia, according to a number of sources (see related story, page 6).

The anatomy of Ghawar was the topic of a presentation given by Abdulkader Afifi, senior geological consultant at Saudi Aramco, during his recent U.S. tour as an AAPG Distinguished Lecturer.

Ghawar is a north-trending anticlinal structure, which is expressed on the surface by outcrops of Tertiary rocks. In the field's northern part the structure actually comprises two parallel anticlines with a small low in between.

Oil was first discovered in 1948 in the northern part using structural drilling, where geologists would map structures by drilling a grid of shallow wells to the top of the Cretaceous, according to Afifi. This technique was developed by Max Steineke, chief geologist at the Arabian American Oil Co. (parent company to Saudi Aramco), who received the AAPG Sidney Powers medal in 1951.

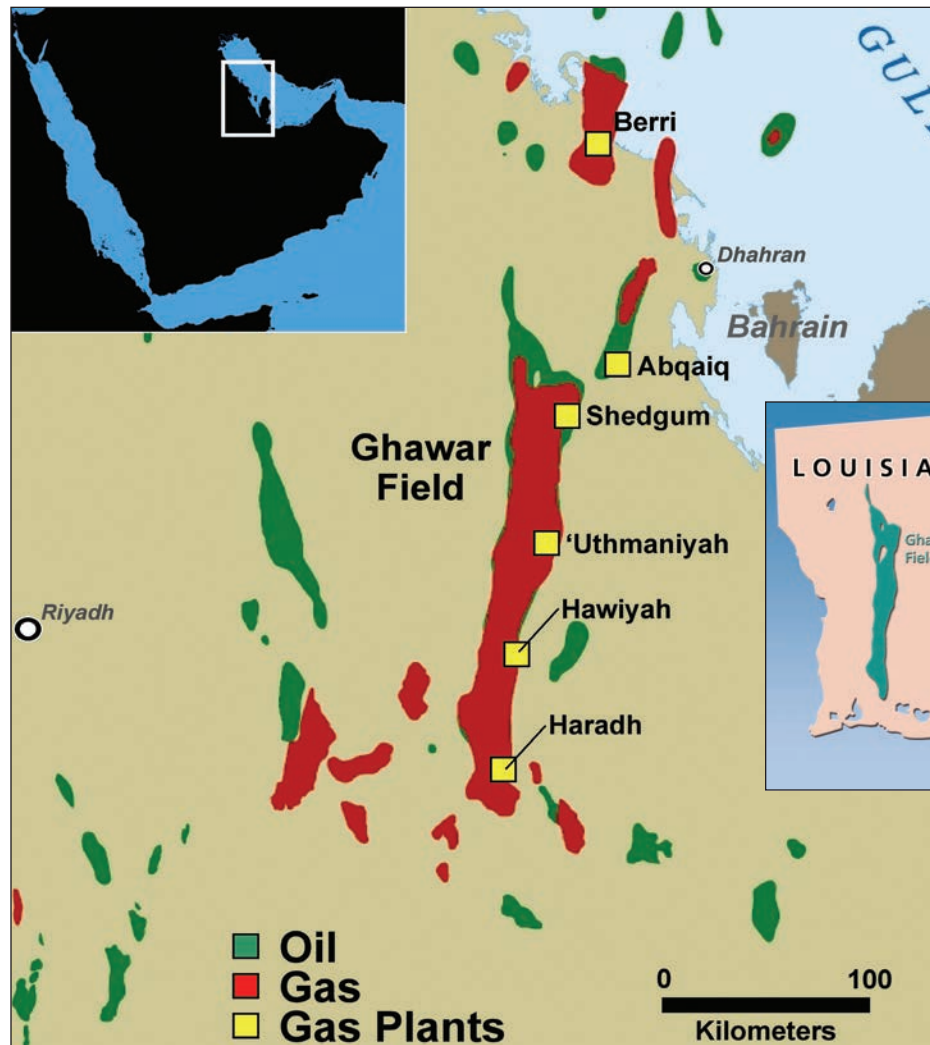
The initial discovery in Ghawar's southern part was in 1949 at the Haradh Field, where American geologist Ernie Berg mapped the surface of the Haradh anticline using the ordinary, tried-and-true plane table method.

The northern and southern discoveries appear as separate fields on early maps prior to being connected as a single field in 1955.

'It's Basic Geology'

The Ghawar anticline is draped over a basement horst, which grew initially during the Carboniferous Hercynian deformation and was reactivated episodically, particularly during the late Cretaceous. The Paleozoic section was eroded significantly by the Hercynian unconformity.

The asymmetrical structure, which is steeper on the western flank, becomes



Ghawar map, graphics courtesy of Saudi Aramco

more complex at depth where it comprises several en echelon horst blocks. Bounding reverse faults have throws as much as 3,000 feet at the Silurian level, but they die out in the Triassic section, according to Afifi.

He also noted there appears to be a minor component of right lateral strike slip.

The producing oil reservoir at Ghawar is the late Jurassic Arab-D limestone, which is about 280 feet thick and occurs 6,000-7,000 feet beneath the surface. Growth of the structure during Arab-D deposition localized grain-dominated shoals in the north, upgrading the quality of the reservoir, which improves upward as it progresses from lime mudstone to skeletal oolitic grainstone.

Fracture density increases going deeper in the section, enhancing permeability in the finer-grained mudstones.

The oil was sourced from Jurassic organic-rich lime mudstones, which were



of both permeability and porosity."

The field's copious production has had help in the form of water injection, which was initiated in 1965.

Water injection volumes are included in a number of publicly available articles

about Ghawar, with one of the more recent ones pegging the injection rate at seven million barrels of seawater per day. Water cut, according to other sources, has been reduced from approximately 35 percent to roughly 30 percent since vertical well drilling was shelved in

favor of horizontal wellbores.

Step on the Gas

But there's more to Ghawar than voluminous oil production.

The field gives up about 2 billion cubic feet of associated gas per day, and it has the capacity to kick out as much as 5.2 billion cubic feet of non-associated gas from the deeper Paleozoic section, where it's trapped in Permian, Permian-Carboniferous and Devonian reservoirs at depths between 10,000 and 14,000 feet. This deep gas is sourced from Silurian shales, which are the main Paleozoic source rocks in the Middle East and North Africa.

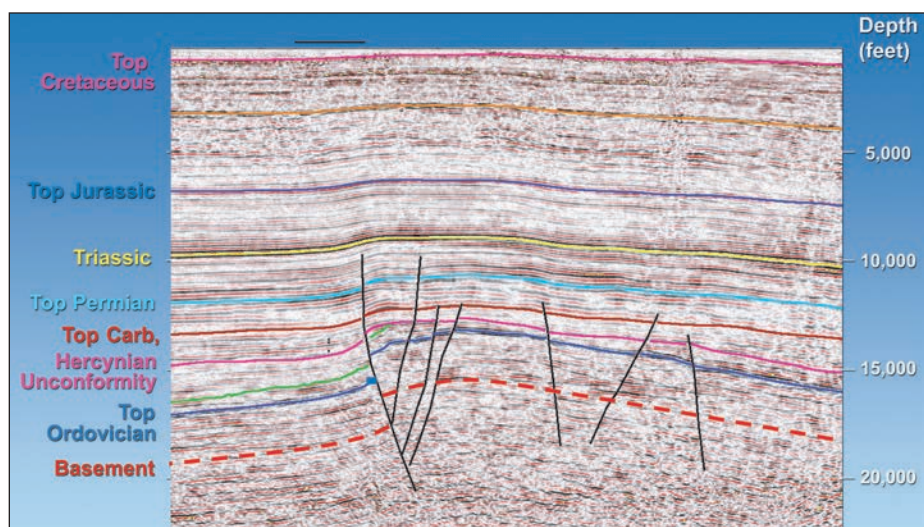
The late Permian Khuff A,B and C stacked carbonate reservoirs are the main gas producing zones at depths of 10,000 to 12,000 feet. Afifi postulates the Khuff gas likely moved laterally into Ghawar from other fields to the north, whereas gas in the deeper Unayzah and Jauf sandstone reservoirs migrated vertically along faults.

The Khuff carbonates are highly cyclical, and gas and reservoir quality is variable owing to extensive diagenesis.

Most of the Khuff is non-porous and tight, according to Afifi, who noted the best reservoir facies are dolomitized periallagonal mudstones.

See **Ghawar**, page 7

East-west seismic depth section, south Ghawar.



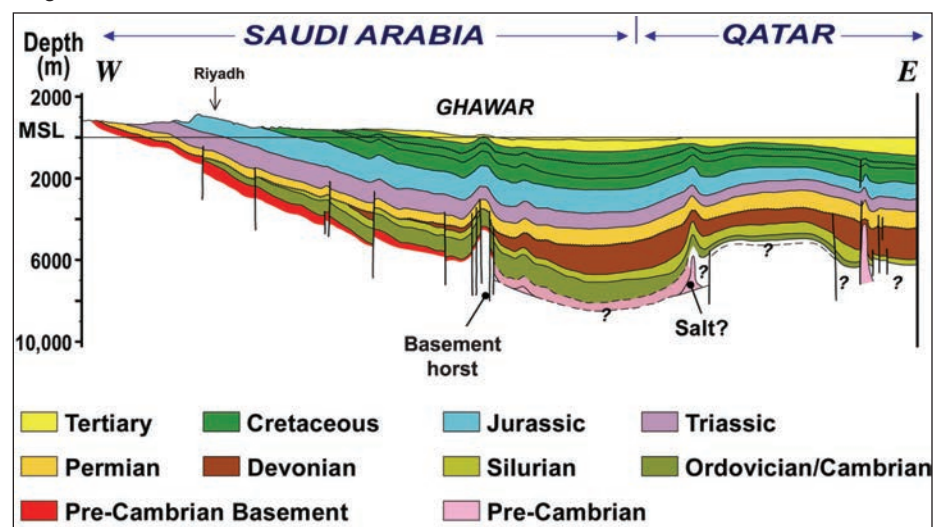
laid down in intershelf basins. The integrity of the thick anhydrite top seal is enhanced by the general absence of faults in the Jurassic section.

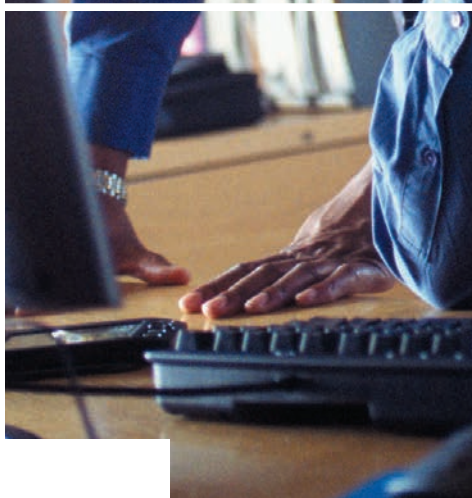
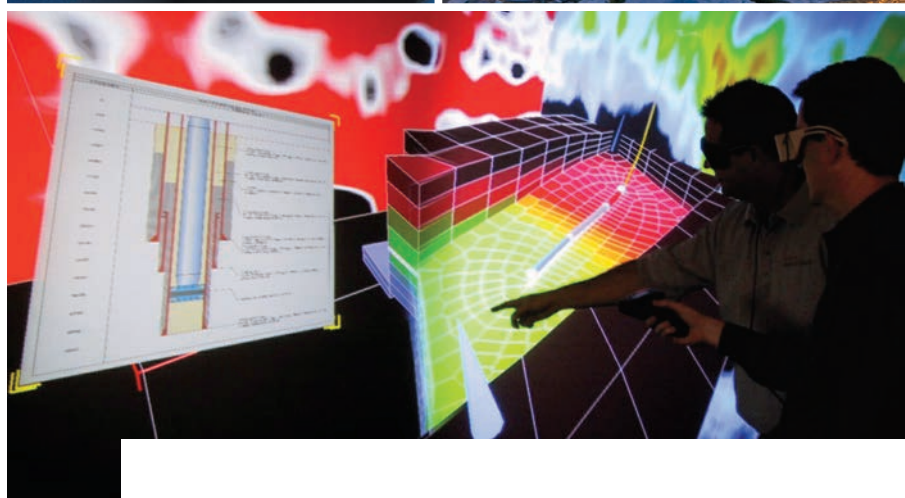
Despite its impressive life span and colossal production volumes, there's really no mystique to Ghawar's grandiosity. Think of it as a Geology 101 scenario, i.e., a lot of geology-type happenings in the right place at the right time.

"It's basic geology," Afifi said. "You need five conditions to form a large oil accumulation, and these things came together in a beautiful manner over a very large area."

"We have the prolific Hanifa Jurassic source rock and an excellent anhydrite seal over the thick, porous Arab-D reservoir," he noted, "and we have a large structure with a favorable growth and thermal history. The upper parts of the reservoir are very clean grainstone, with porosity exceeding 30 percent in places. In fact, the Arab-D is outstanding in terms

Regional east-west cross section.





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*Can the Status Quo Be Maintained?***Saudi Supply Demanding Attention**

By LOUISE S. DURHAM
EXPLORER Correspondent

There's enough rhetoric – much of it conflicting – about oil supply/demand these days to prompt even the hardest observer to reach for the aspirin bottle.

For instance: Global demand continues unabated vs. prices cooling China demand; OPEC can produce however much oil needed vs. OPEC is at capacity, etc., etc.

Adding to the uncertainty is OPEC's recent out-of-the-blue call for the United States to release oil from the Strategic Petroleum Reserve to help cool prices. The plea received little attention despite the fact OPEC prides itself in being able to control prices, ideally holding them just high enough to keep the coffers full yet low enough to discourage major consumers from serious development of alternative fuels.

When OPEC kingpin Saudi Arabia recently announced a production increase, there was scant mention the increase was mostly in the form of low quality crude rather than sweet.

Whether these recent actions can be viewed as red flags is a matter of opinion. One observer, longtime energy investment banker Matt Simmons, CEO of Simmons and Company International in Houston, says there's ample cause to be concerned about Middle East oil supply, particularly that of Saudi Arabia.

"We've basically created a global energy plan built on a house of sand," Simmons said, "and there's no Plan B if their production actually starts to decline, just like the U.S. did and like the North Sea is doing.

"Saudi Arabia's last giant field, Shaybah, was discovered in 1967, and what we have in Saudi Arabia is a handful of fields all too old for a world that assumes oil is anywhere you want to find it in the Middle East," he said. "It's the last Great Myth: Oil is everywhere.

"It turns out there's an unbelievably tiny concentration in the Middle East of what I call the golden triangle of energy," he continued.

The triangle starts with Kirkuk at the top of Iraq, comes down the eastern side and in 20-30 miles east of the Iranian-Persian border, drops down to the bottom of the UAE and comes across to a leg back up to Kirkuk, which is about 40 miles west of the western border of the Persian Gulf.

"That's about a 1,000-mile by 450-mile by 800-mile triangle," Simmons said. "And in that triangle is every significant oil field ever found in the Middle East.

"Saudi Arabia has searched for 30 years to find oil outside this very tiny area in the eastern province to try to find 'Plan 2'," he said, "but the only few commercial discoveries ever made were modest in terms of Middle East oil fields."

The only major commercial discovery was 50 miles southwest of Riyadh in 1989 at the Hawtah Field, which became known as the Hawtah trend. Production peaked at 200,000 barrels of oil a day.

The water injected, according to Simmons, was corrosive and laden with bacteria, severely damaging the reservoir's long-term sustainability.

A Lot From a Few

To answer his own growing list of questions and gain insight into Saudi field discoveries, production methods and volumes, Simmons analyzed more

than 200 SPE technical papers on the subject. His findings were reviewed by a number of technical experts.

"If you read carefully, a totally different picture emerges than you get by listening to people who say they have 260 billion barrels of reserves and, conservatively, they'll get 70 to 80 percent recovery," Simmons said, "which no else in the world has ever done.

"I think they're on the last legs of easily recoverable oil, and they'll end up with 35 to 45 percent recovery of original oil in place, just like the performance of other carbonate reservoirs," he said.



"To recover far more will require using artificial lift and exponentially more wells."

What makes the Saudi oil picture so uncomfortable overall, Simmons noted, is the asymmetry of the oil supply.

"Eight fields have effectively been 98 percent of all they've ever produced,

and six fields are basically 95 percent," he said. Ghawar (see related story, page 4) is one, and it's consistently been 60 to 65 percent of all the oil they've ever produced from the late '50s to 2004. We could find these fields are about to roll over like all great fields have done, and when Ghawar goes into decline, the world's peaked."

For now, Ghawar continues to churn out about 5 millions barrels of oil per day, thanks in large part to an extensive

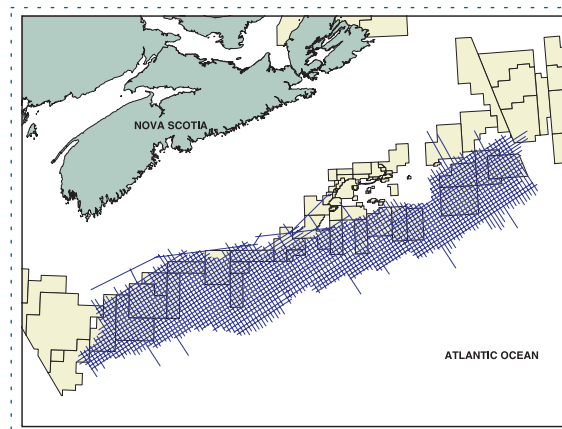
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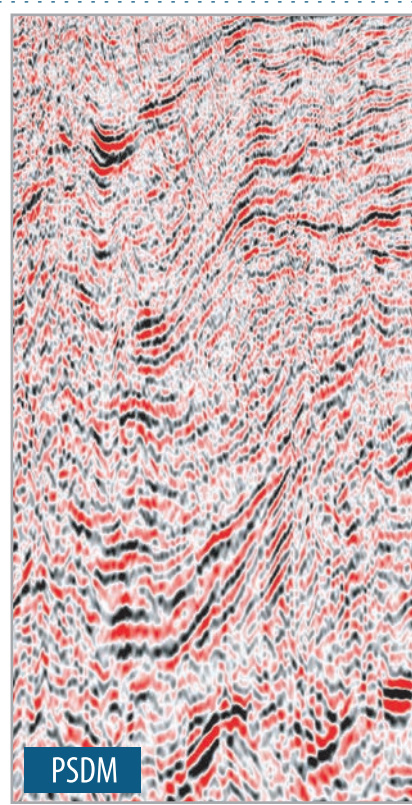
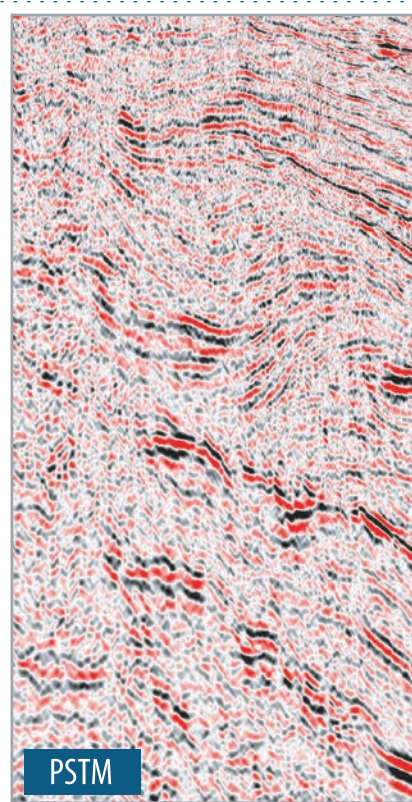
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water maintenance program. The question is, can the status quo be maintained?

"They've now shut down most vertical wells doing anything but water injection, with all new wells being extended reach horizontal multi-lateral wells," Simmons said. "These are basically just hiding from a rapidly emerging gas cap and hiding in the middle of the ever-thinning oil column as the water column is rising to the top of the field."

"When that day is over, these fabulous wells creating this productivity through eight to ten wellbores will all water up."

A Matter of Trust?

Saudi Aramco has a far different take

on the future of Saudi oil.

In fact, the company sent two of its high-ranking executives to Washington, D.C., in February to refute Simmons' assertions when he presented his findings to the Center for Strategic and International Studies.

A transcript of the presentations included comments by Nansen Saleri, manager of reservoir management at Aramco, regarding current and future production.

The current company plan is to maintain capacity of 10 million barrels/day and to replace reserves to the tune of 15 billion barrels between 2005 and 2009, Saleri said. He declared if Aramco ramps up to 12 million barrels daily production by 2014, this can be sustained comfortably for 50 years or more.

He elevated the numbers even more, stating the company actually could produce and maintain as much as 15 million barrels a day until 2054.

Saleri qualified his remarks somewhat by noting this depends on world market conditions.

To reinforce his predictions, Saleri emphasized the company's capabilities, including extensive use of advanced technologies and the ability to ride herd on water cut levels. He emphasized the reduction in water cut on average at Ghawar.

The potential production numbers may be impressive, but Simmons maintains that Saudi Aramco has not been forthcoming with production data to back up its claims.

"They didn't say how they would be able to do this," he said, "and I say we're badly in need of massive data reform. We need true energy transparency."

"We need field by field disclosure of historical production and the average number of producing wellbores that created it," Simmons said, "so analysts for the first time ever can do productivity decline rate analysis versus 'trust me, we don't have a problem.'"

"Then we need three specific pieces of proven reserve data by field, verified by a third party, just as someone like, for example, GE needs their books audited even though they know them better than anyone," he said. "Then, if three years from now, there is no sign of any problem, I'll publicly say I was an alarmist to raise this."

"All we're getting now is 'trust me', and I say we're in the mode of 'trust but verify.'"

Ghawar

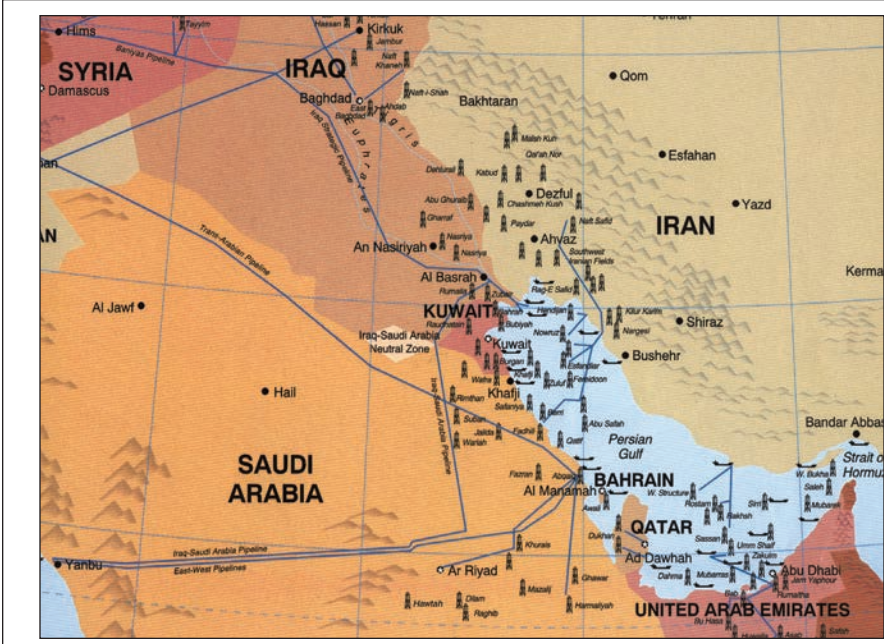
from page 4

The Permo-Carboniferous Unayzah sandstones, which overlapped the ancestral Ghawar highlands from the south, contain sweet gas at depths of 12,000 to 14,000 feet. The gas is trapped structurally and stratigraphically in a mix of eolian, fluvial and lacustrine clastics. Variable reservoir quality is attributed to quartz cementation for the most part.

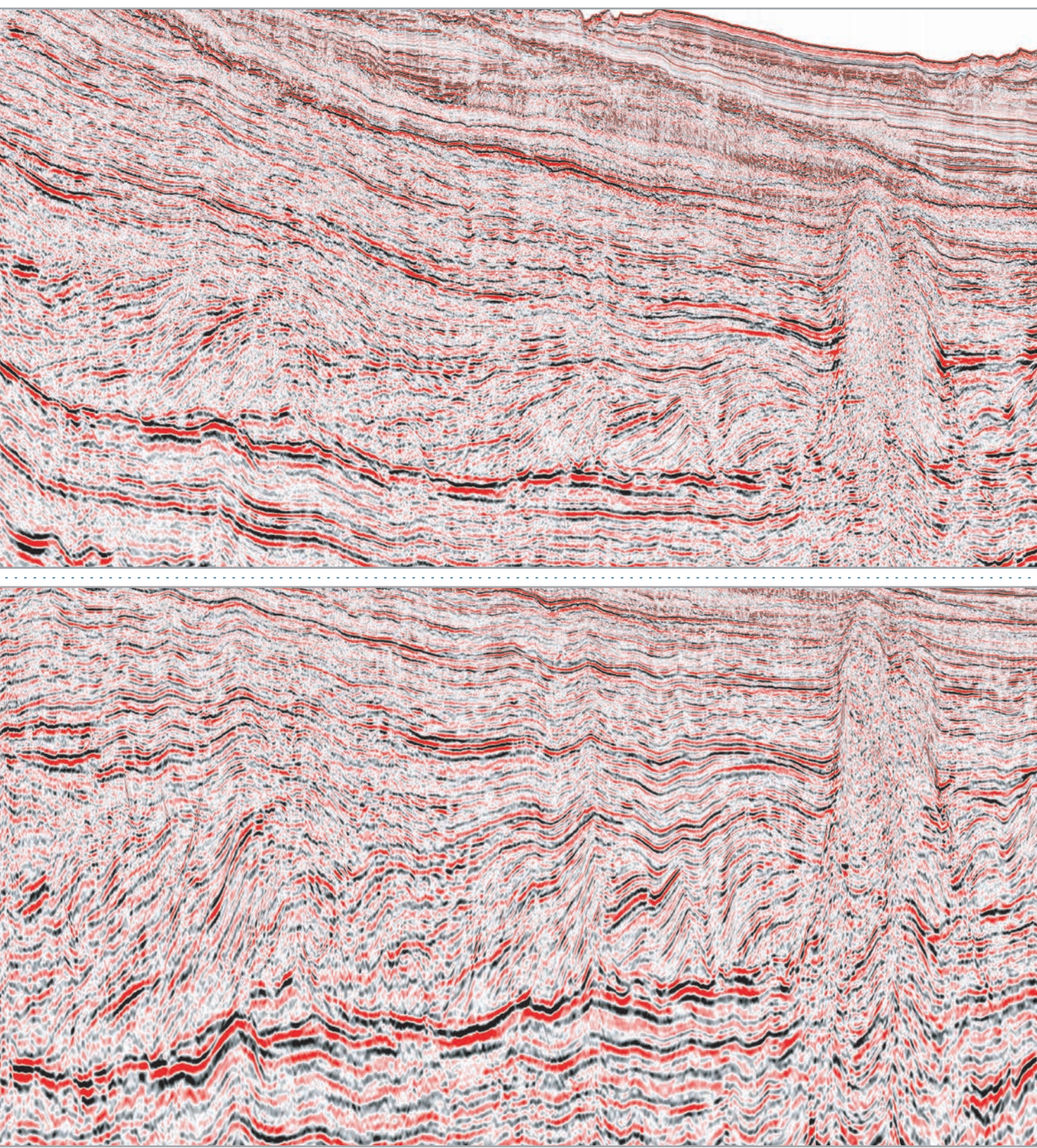
Additional sweet gas was discovered in 1994 in a fault/unconformity trap in Devonian sandstones, which were truncated along Ghawar's eastern flank.

The key challenge to deep gas exploration and development at Ghawar has been porosity prediction using geologic models and 3-D seismic data, according to Afifi.

He noted that seismic imaging is challenging because of multiples and near-surface velocity variations and low-impedance contrast in the Paleozoic section.



Graphic by AAPG EXPLORER



Needs May be Overcoming Obstacles

Alaska and Inertia: Synonyms?

By DAVID BROWN
EXPLORER Correspondent

If you enjoy slow-motion movies, keep an eye on oil and gas development in Alaska.

While there's plenty of action, the pace of progress seems glacial.

Here's the big news.

✓ A long-anticipated, 3,500-mile Alaska natural gas pipeline is finally inching toward reality.

✓ More lease acreage will become available in the National Petroleum Reserve-Alaska (NPR-A).

✓ Several new offshore areas will open for petroleum development, including parts of Bristol Bay and the Beaufort Sea.

If things go right, new gas resources from NPR-A and other North Slope areas will feed a major gas pipeline for Canadian and U.S. markets.

The timeframe for all of this? Years and years.

And years.

Prudhoe Pipeline

Alaska's state government has identified a gas pipeline from Prudhoe Bay as its number one economic initiative.

"It's a huge revenue boost for the state government, on the order of \$400 million a year," said Mark Myers, director of Alaska's Department of Natural Resources Division of Oil and Gas.

Economics argue for a 48- to 52-inch line, because tariffs are more efficient with a large-diameter line and high throughput, Myers said.



Photo courtesy of Joint Pipeline Office

Pipelines remain an important factor in Alaska's energy future.

"Initial designs would look at shipping 4-to-4.5 bcf a day, expandable to 5-to-6 bcf through compression," he noted.

Those plans took a leap forward in October when Congress passed a measure streamlining the regulatory approval process and providing loan guarantees for a new Alaskan pipeline.

In June, a unit of TransCanada Corp. asked Alaska to resume processing its right-of-way lease application for the proposed Alaska Natural Gas

Transportation System, said Rhea DoBosh, communications manager for the Joint Pipeline Office (JPO) in Anchorage.

JPO is a consortium of six state agencies and six federal agencies sharing regulatory responsibility for oil and gas pipelines in Alaska, primarily the Trans-Alaska Pipeline System (TAPS).

The state held a public review process on the TransCanada application in November and December, preparing for a final determination in 2005, DoBosh said.



Current plans call for a pipeline "most likely" route extending south from Prudhoe Bay to Fairbanks and Delta Junction, following the current TAPS path.

It then would parallel the Alaskan Highway east into Canada, linking with existing gas shipping infrastructure in Alberta.

DoBosh said the application review process involves only state lands right of way.

"That would leave a few miles of right of way left to the Canadian border," she noted – most of it private or Alaskan native land.

Estimated cost of the pipeline project is \$20 billion, with the first gas moving through the system in eight to 10 years.

Doubts and Delays

Plans for the Alaska gas line barely crawled forward in recent years, largely because of economic concerns.

TransCanada already has announced it may convey its Alaskan right-of-way leases to another corporation or partnership in the event of a favorable decision.

"What TransCanada would like to do is

See **Alaska**, page 16

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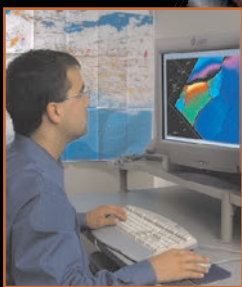
10-14	Advanced Subsurface Structural Geology	Houston, TX
19-21	Basics of the Petroleum Industry	Houston, TX
31-04	Seismic Fundamentals for Exploration and Development	Houston, TX

February, 2005

14-18	Cased Hole and Production Log Evaluation	Houston, TX
14-18	Applied Subsurface Geological Mapping	Denver, CO

March, 2005

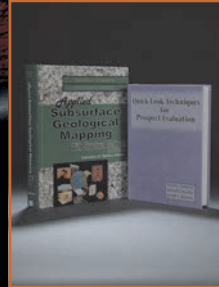
7-11	Applied Subsurface Geological Mapping	London, England
9-10	Quick Look Mapping Techniques For Prospect Evaluation	Houston, TX
14-18	Geophysics for Geologists and Engineers	Houston, TX
28-01	Applied Subsurface Geological Mapping	New Orleans, LA



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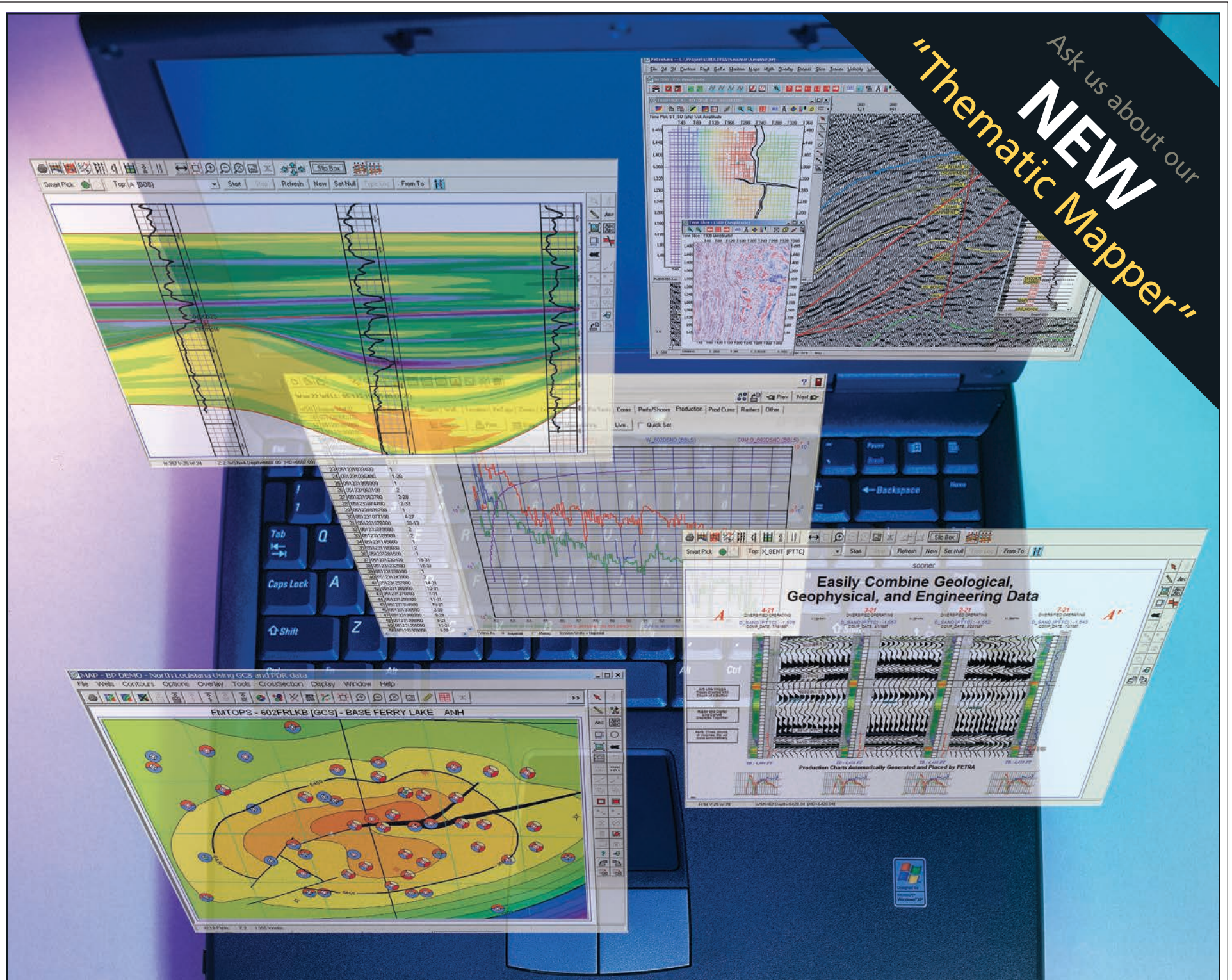
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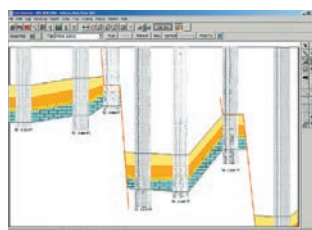
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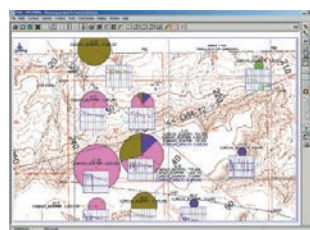
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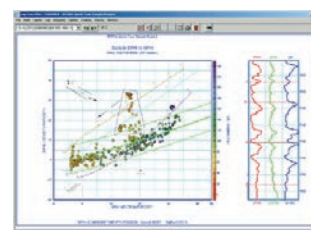
CONTOURING
Faulted contours
Isopachs
Volumetrics
Grid operations
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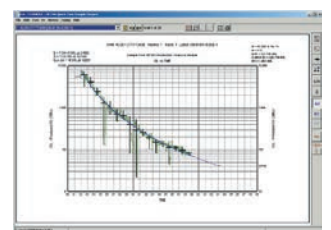
CROSS SECTIONS
Digital and/or Raster
Geocolumn shading
Multiple rasters/well
Stratigraphic/Structural
Shade between crossover
Dipmeter data



MAPPING OPTIONS
Bubble maps
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A more complete listing is available on the EXPLORER Web site at www.aapg.org.

AFRICA

It may not have been a year for elephant discoveries, but in 2004 a number of important wildcats added to the world's reserve inventory potentials.

Here is a list of some of those significant finds along with the commentary as reported by the IHS

Algeria – First Calgary's Ledjmet South 1 wildcat weighed in with a 13,515 bod and 30.9 mmcf/d winner in the onshore Berkine Basin. Sontract hit big with its find in the Hassi Messaoud Basin, there testing 4,445 bod with 4.3 mmcf/d, and with the BKP2 in the Oued Mya Basin, at 3,072

bod and 21 mmcf/d.

Angola – Four deepwater discoveries in the Congo Fan included Total's Canela 1, testing 6,800 barrels of oil a day, and ChevronTexaco's KX2 flowing at 5,000 bod.

Egypt – Twenty-seven discoveries were reported, including Suco's 3,000 bod find in the Gulf of Suez, Sipetrol's 3,250 bod wildcat and Shell's Shieba 18-3 testing at 1,600 bod with gas – both in the onshore Abu Gharadig Basin.

Equatorial Guinea – Vaalco's Avouma 1 on the shelf of the Lower Congo Basin flowed 6,600 bod.

Nigeria – Total's Preowei 1B in the deepwater Niger Delta area is potentially significant, as Total has already indicated a desire to develop the find even though the first appraisal well has yet to be drilled.

Mauritania – The offshore again has hosted a number of exploratory wells, and Dana's Pelican 1 is arguably the best. The operator confirmed in-place reserves of 1.03 tcf, with technically recoverable reserves in the range 600-800 bcf together with 10-13 mmb of associated liquids. However, as the base of the hydrocarbon-bearing interval was not encountered, these figures could be revised upwards.

Tunisia – ENI tested two discoveries in the Ghadames Basin, one testing 6,200 bod with 14.3 mmcf/d, and the other at 3,600 bod.

AUSTRALASIA

Australia – ChevronTexaco's Wheatstone 1 exploration well in the North Carnarvon Basin is viewed as a multi tcf gas find that is likely to be tied into Gorgon, or maybe even the Northwest Shelf. The well encountered 53.34m of net gas sands in the objective Jurassic Tithonian and Triassic Mungaroo sands, in which a production test flowed 54 mmcf/d of gas.

Also worthy of note is that BHP-Billiton made a number of oil discoveries (Eskdale, Harrison and Stickle) that have opened a medium-sized oil province in the offshore Carnarvon Basin.

New Zealand – The Amokura 1 and Pateke 2 discoveries, drilled by NZOP, were found to be on the same field. They represent the first oil discovery in New Zealand in a number of years.

EUROPE

France – At a country level, Les Mimosa 1GD is considered as outstanding as it is one of several prospects to have been identified – and also that most of the Lege permit, in which it lies, is now open for bidding.

An Aquitaine Basin discovery by ExxonMobil flowed 1,600 bod.

Poland – PNGG's Zaniemysl 3 in the Fore-Sudetic Monocline flowed 2.5 mmcf/d, and Cierpisz2 in the Outer Carpathian Foredeep tested at 26.9 mmcf/d.

FAR EAST

Bangladesh – Bangora 1 operated by Tullow is a potentially huge, significant discovery that encountered a number of gas-bearing intervals between 2,580-3,285 meters. Three lower most intervals were tested flowing a combined 120 mmcf/d, with the shallower units to be tested at a later date.

The company has now tested gas at either end of a 400-kilometer long anticlinal trend, and an accelerated appraisal program is planned.

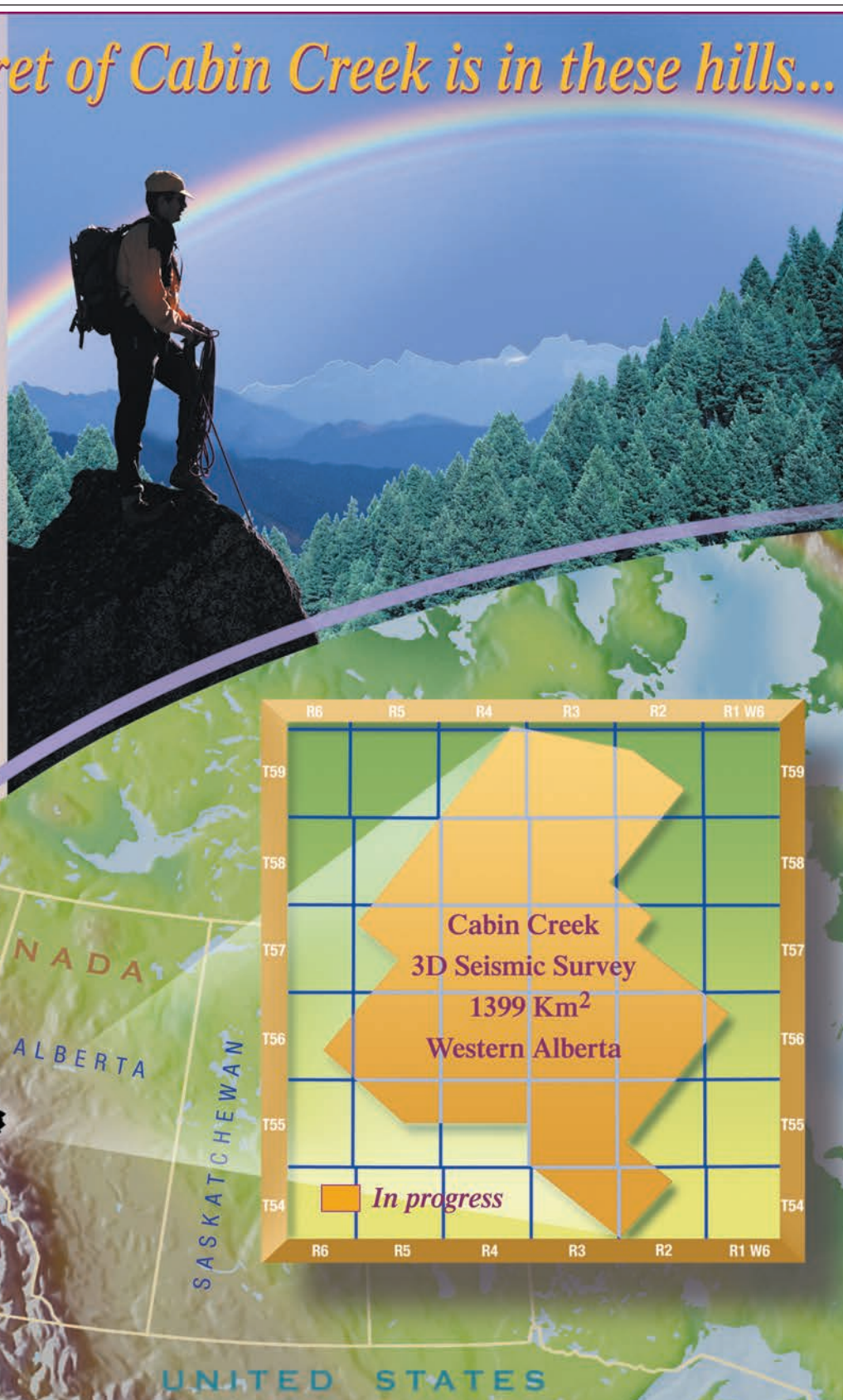
China – Although no reserves have been assigned, Laopunan 1 has been proclaimed by PetroChina as its largest and most significant discovery in 2004,

See **Discoveries**, page 12

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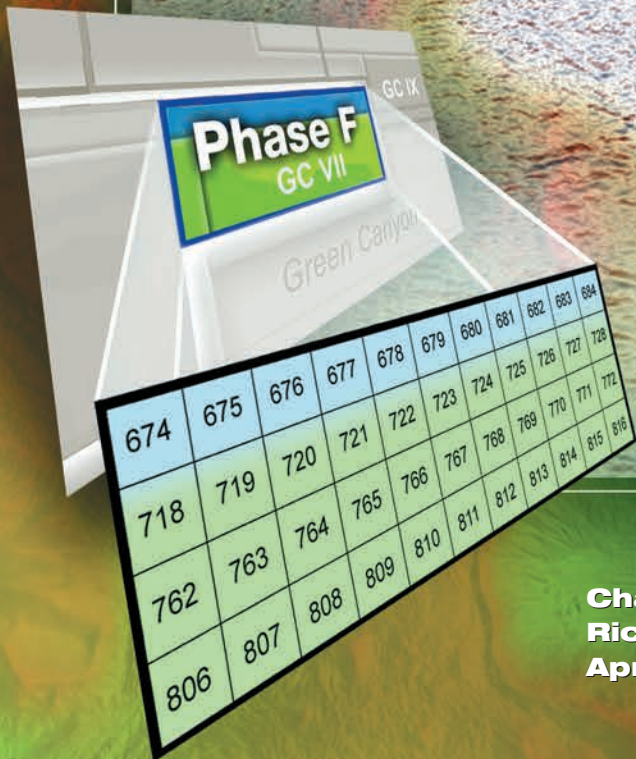
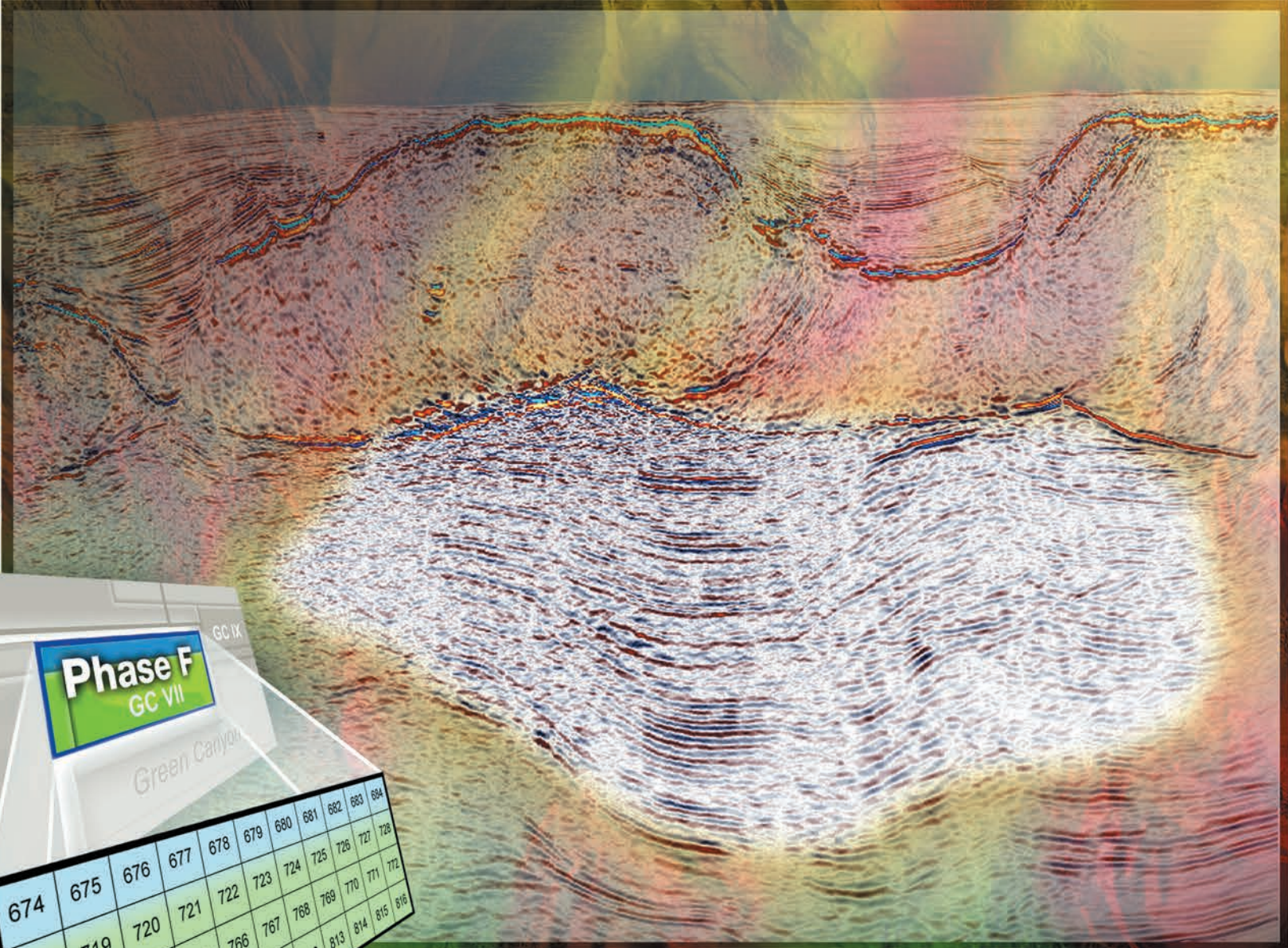
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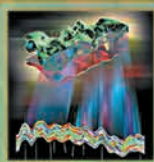
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Three AAPG Lecture Tours Set in January

January will be a busy month for AAPG's Distinguished Lecture program, with three speakers touring in the United States and Canada.

□ **Philip Currie**, curator of dinosaurs at the Royal Tyrrell Museum of Paleontology, Drumheller, Canada. His tour dates include:
 ✓ Jan. 10 – University of Toronto.
 ✓ Jan. 11 – Pittsburgh Association of Petroleum Geologists.
 ✓ Jan. 12 – McGill University, Montreal.
 ✓ Jan. 13 – Dalhousie University, Halifax.
 ✓ Jan. 14 – Memorial University, St. John's, Canada.
 ✓ Jan. 18 – North Carolina State University, Raleigh, N.C.

□ **Ron Steel**, professor and Davis Chair, University of Texas, Austin. His tour dates include:

✓ Jan. 11 – Tulsa Geological Society.
 ✓ Jan. 12 – Montana Geological Society, Billings, Mont.
 ✓ Jan. 13 – Saskatchewan Geological

Society, Regina, Canada.

✓ Jan. 14 – University of Saskatchewan.
 ✓ Jan. 17 – Utah Geological Association, Salt Lake City.
 ✓ Jan. 19 – Corpus Christi Geological Society.

□ **David C. Jennette**, research project manager, Bureau of Economic Geology, Austin, Texas. His tour dates include:

✓ Jan. 24 – Fort Smith Geological Society, Fort Smith, Ark.
 ✓ Jan. 26 – Michigan State University, Lansing, Mich.
 ✓ Jan. 27 – Western Michigan University, Kalamazoo, Mich.
 ✓ Jan. 28 – University of Wisconsin, Madison.

✓ Jan. 31 – University of Ottawa.
 ✓ Feb. 1 – McGill University, Montreal.
 ✓ Feb. 2 – University of Cincinnati, Ohio.
 ✓ Feb. 3 – West Virginia University, Morgantown.

Detailed information is available at www.aapg.org.

Discoveries

from page 10

testing at 4,400 bod and 5.6 mmcf/d. It is located in around three meters of water and was drilled on the Nanpu 2 structure in the southern part of the Nanpu Sag, Bohai Gulf Basin.

PetroChina also struck with five discoveries in the Tarim Basin, including the Yugi 4, testing at 944 bod and 1.8 mmcf/d, and the Lungu 39, flowing at 355 bod and 41.3 mmcf/d.

India – For the second year, India's offshore has been a key exploration area. In 2004 it is the Reliance wells on the Dhirubhai structure in the NEC-OSN-97/2 block that are regarded as most significant as these have shown the shallow water

area of the Mahanadi Basin to hold significant amounts of gas. Reliance reported a total of seven discoveries in three offshore basins.

Indonesia – The Jeruk 1, a big oil discovery made by Santos with likely minimum reserves 170 mmbbl contained in the Kujung Formation in the offshore East Java Basin, has been successfully appraised. Eni completed Aster-1 as an important new field discovery. Although untested, this well opens the potential for a new deepwater play in the Tarakan Basin and has high-graded an area where the median line is disputed.

Vietnam – The 09-R 23X well is understood to have flowed about 1,100 bod of 35-degree API crude and is claimed by the operator to be first basement oil discovery in the southern part of Block 09 in the offshore Cuu Long offshore basin.

LATIN AMERICA

Colombia – Perenco's Jordon Este 1 flowed 1,877 bod in the Llanos-Barinas Basin.

Cuba – Although considered non-commercial, Repsol YPF's Yamagua 1 is an important well in that it is the first to be drilled in Cuba's deep water, and also because light oil was found. The structure is subject to further seismic evaluation, and at least two more wells are being considered.

Mexico – Among the 21 discoveries reported by Pemex, seven were offshore, including the Itla 1 in the Gulf Coast Basin, testing at 1,350 bod with gas, and the Kosni 1 in the Tampico-Misantla Basin, flowing 29.4 mmcf/d.

Venezuela – Oil-in-place for the Travi Este structure, successfully drilled by the Travi Este 2X wildcat, was estimated by PDVSA at the time of logging at 670 mmbbl and 2.6 tcf of gas from a 220-meter net pay section in the Naricual and San Juan formations; this ranks among the country's most important wells in 2004.

Also, ChevronTexaco's Loran 2X in the Plataforma Deltana is believed to have found reserves of 4-6 tcf and is being touted as the catalyst to launch the country's LNG project.

MIDDLE EAST

Libya – Six discoveries were reported, including Repsol's find in the Murzug Basin testing 1,350 bod.

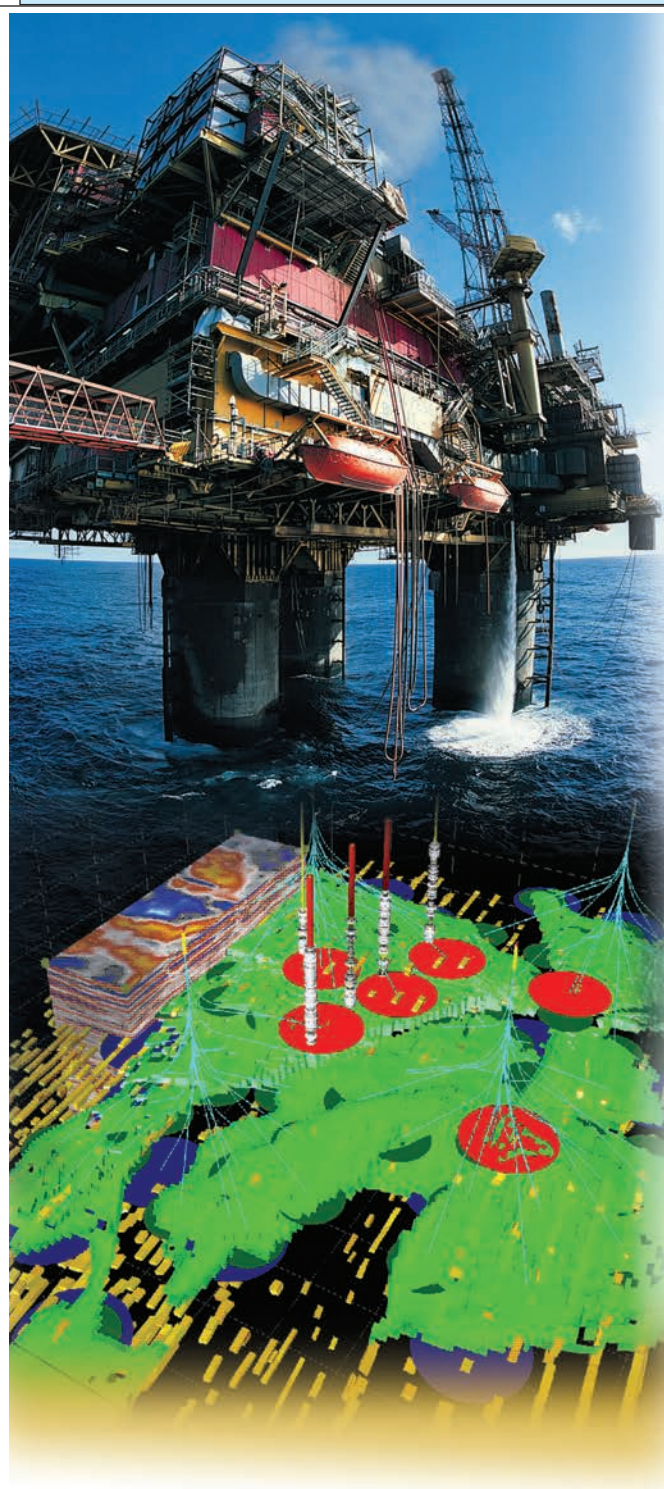
Saudi Arabia – Shaybah 700 is significant, as it established a new non-associated gas/condensate play and work continues to evaluate a deeper gas objective. It has the potential to be a very large find with reserves estimated at 3 tcf of gas and 100 mmbbl condensate.

Kuwait – Mutriba 12 was reported to have discovered sweet gas and 50-degree API condensate in the Lower Triassic Sudair Formation; a second test suffered a technical failure. The well was drilled to a total depth of 6,736 meters and is considered the first non-associated gas producer in Kuwait.

KOC also found 4,850 bod in the Dibdibah Sub-Basin with the Bahrah 28.

NORTH AMERICA

Gulf of Mexico – Although no reserves have been published, the Jack (ChevronTexaco) and St. Malo (Unocal) discoveries are considered significant as they both are located in the newly established Paleogene trend. □



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Internet Voting Available For AAPG Officer Slate

Members can cast their online balloting for AAPG officers beginning next month, continuing an electronic voting option first used in 2004. Also, the Executive Committee voted to mail paper ballots as well, giving members a choice in the manner of voting.

Watch for the online ballot availability on www.aapg.org.

E-voting was perceived as a possible factor in garnering a higher percentage of members voting for Executive Committee positions last year.

Last year a total of 6,644 ballots were cast of the 17,501 possible votes from Active AAPG members. Of those, 2,035 ballots were cast via the Internet and 4,609 were mailed on paper ballots. Last year was the first time members had the option of using either method of voting.

That compares with a total of 4,836 ballots cast in 2003; 5,615 in 2002; and 5,138 in 2001.

The use of the new technology is hoped to make it easier for all members to vote, and preclude the necessity of non-U.S. members to pay postage to submit their ballot.

As part of the transition process to an all-electronic ballot in the future, printed ballots were mailed to all eligible voters. The same regime is being followed this year, with an eye to all-electronic voting in the future.

Survey & Ballot Systems Inc., in Eden Prairie, Minn., will again handle the printing, Web technology and ballot counting. Last year an AAPG member monitored the ballot collection and counting process.

Each printed ballot and logon code are matched to preclude the counting of more than one vote. If both a printed ballot and an electronic ballot are case, the printed ballot will be the one tallied. The codes on the paper and electronic ballots are exclusive to each other and are not linked to the identity of the member, ensuring voter anonymity.

All ballots should be cast and paper ballots received at the address provided by May 15. Results will be posted on www.aapg.org and will appear in the June EXPLORER.

Information on this year's slate of candidates can be found in a special insert at page 14-15 of this issue. □

Canadian Core Conference To Follow Annual Meeting

By GERRY REINSON
CSPG Core Conference Chair

This year's annual Canadian Society of Petroleum Geologists' Core Conference, a cornerstone of the CSPG' technical offerings, will be held June 23-24 in Calgary, immediately following the AAPG Annual Convention.

Because of the potential for record-setting attendance numbers – thanks to being held at the end of the AAPG meeting – the session is being organized to cover the broad spectrum of interest of the AAPG convention attendees.

The venue will be (as it has been for the past 35 years) the Alberta Energy and Utilities Board Core Research Centre, the world's largest and most functional facility of its kind.

The conference theme is "Exploring Energy Systems," and some 30 core displays – with supporting posters – will be organized into three sub-themes:

✓ Unconventional – Displays

including coal-bed methane, tight-gas and oil-sands/heavy-oil cores from Canada and the United States.

✓ Conventional – Displays of both sandstone and carbonate reservoirs representative of the varied producing zones in the Western Canada Sedimentary Basin. Canadian Frontier examples will include the Mackenzie Delta, Scotian Shelf, Northwest Territories and Grand Banks.

✓ Frontier/international hydrocarbon systems – Displays from regions such as the Alaskan North Slope, Gulf of Mexico and the North Sea, and countries such as Ecuador, Saudi Arabia, Brazil, Mexico and Yemen.

The Core Conference cost is an additional registration fee of \$30 U.S., which covers attendance for both days, a core-manual publication and entry to the "Core Meltdown," an informal BBQ and refreshments party on the event's final day. □

Levorsen Awardees Announced

Levorsen Award winners, honored for presenting the best paper at an AAPG Section meeting, have been announced by various Sections.

Winners will receive their awards at the respective 2005 meetings.

They are:

Pacific Section

□ Michael S. Clark, with ChevronTexaco, Bakersfield, Calif., for "Reservoir Characterization of a Diatomite-Sandstone Reservoir Using Integrated Core and Log Analysis, Lost Hills Field, California."

His co-authors were Dale Julander and Tom Zalan, both with ChevronTexaco, Bakersfield.

Rocky Mountain Section

□ Robert A. Lamarre, with Lamarre Geological, Denver, for "Atlantic Rim Coalbed Methane Play: The Newest Successful CBM Play in the Rockies."

His co-author was Stephen K. Ruhl,

Anadarko Petroleum, The Woodlands, Texas.

Eastern Section

□ Langhorne B. "Taury" Smith, with the New York State Museum Reservoir Characterization Group, Albany, N.Y., for "Outcrop Analogues for Lower Paleozoic Hydrothermal Dolomite Reservoirs, Mohawk Valley, New York." His co-author was Richard Nyahay, also with the New York State Museum Reservoir Characterization Group, Albany.

Gulf Coast Association Of Geological Societies

□ Roger A. Young, with eSeis Inc., Houston, for "Conforming and Non-Conforming Sands – An Organizing Framework for Seismic Rock Properties."

His co-author was Robert D. LoPiccolo, also with eSeis in Houston. □



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Alaska from page 8

to build the Canadian portion, and they'd like to have a partner for the U.S. part," DoBosh noted. "We're looking at \$20 billion. That's a lot."

Two key pieces of legislation, one state and one federal, pushed the pipeline plan into higher gear.

Alaska's legislature passed a Stranded Gas Development Act in 1998, to encourage a pipeline outlet for stranded North Slope gas.

The act lessened financial risks for a pipeline project by reducing and delaying tax and fee burdens.

In 2003, Alaska strengthened and extended the measure.

TransCanada then filed its renewed

application under the stranded gas act.

Congress added enabling legislation for an Alaskan gas line to its 2005 military construction appropriations bill.

In addition to authorizing the pipeline, Congress expedited the federal study, review and permitting processes.

It also provided loan guarantees that should lower borrowing costs for pipeline backers. The guarantee on project loans could reach \$18 billion, or 80 percent of the total capital costs.

Congress lit a rocket under the Federal Energy Regulatory Commission (FERC), which was given broad authority on environmental and access matters for the proposed line.

FERC now expects to issue a decision in February on requirements allowing gas shippers access to pipeline capacity.

Several other companies submitted proposals for their own pipeline development plans, including

MidAmerican Energy Holdings Co., an affiliate of Warren Buffet's Berkshire Hathaway group, and a consortium of North Slope gas producers.

Some observers view these alternative proposals as placeholders in political maneuvering over pipeline rights and construction plans.

However, the Alaska Natural Gas Development Authority has its own plan for an all-Alaska LNG project, including a gas line from Prudhoe Bay to Valdez on existing TAPS right of way.

But it's unlikely that two gas pipelines will be built, if future North Slope natural gas production can't secure the economic future of one.

Wanted: Gas Production

In addition to 36 trillion cubic feet of known gas reserves, northern Alaska may offer more than 230 tcf of technically

recoverable, conventional gas, Myers said.

"You can add into that one of the real sleepers on the North Slope – gas hydrates," he said.

The Prudhoe Bay area alone might hold more than 100 tcf of hydrates, a projected 20 percent economically recoverable, according to Myers.

Add up all the numbers, and a gas pipeline could have a life of "100 years, if you believe a significant portion of the resource can be recovered," he said.

Known gas reserves at Prudhoe Bay and Point Thompson alone would not support the economics for a major gas line, and the ANWR area isn't seen as heavily gas-prone.

That's turned industry attention to NPR-A, the 23.5 million-acre petroleum reserve just inside Alaska's northwest corner.

According to the U.S. Energy Information Agency, NPR-A contains an estimated 40-85 tcf of technically recoverable, non-associated gas and another 7-17 tcf of recoverable associated gas.

In June, the Bureau of Land Management issued a draft amendment to its land use plans for 4.6 million acres in the northeast corner of NPR-A.

ConocoPhillips and Anadarko discovered a stratigraphic oil play in the Alpine Field near that area, and have extended it onto NPR-A acreage.

A decision on opening the additional acres to leasing should come early in 2005, said Susan Childs, BLM project lead for the northeast NPR-A amendment.

BLM also will prepare a use plan for the southern/Colville River area of NPR-A, with a final record of decision likely in three to four years, she said.

"It's a slow process, but we're moving forward. We have a multi-use mission, so we have a variety of issues to consider to protect the environment," Childs said.

Two records of decision issued by the Interior Department in 2004 brightened the future for NPR-A oil and gas development.

In January, it ruled that all BLM-managed lands in the 8.8 million-acre northwest section of NPR-A will be available for oil and gas leases, although development of 1.57 million environmentally sensitive acres will be deferred for 10 years.

In November, the department approved ConocoPhillips' plans to build production pads for five Alpine satellites.

Two are on NPR-A acreage, two on native corporation land and one on state land. ConocoPhillips said development drilling at the two NPR-A sites could begin in 2008, if it can obtain all permits and clearances, leading to the first commercial oil production from the petroleum reserve.

Approval for initial production from NPR-A represents a small but symbolically important step, said H. Sterling Burnett, a senior fellow at the National Center for Policy Analysis in Dallas.

"It's not a wildlife refuge," he said. "It's not a national park. It's been set aside for 80 years to drill for oil and gas."

Five oil companies bid \$53.9 million for lease tracts covering 1.4 million acres of NPR-A's northwest section in June.

Seven conservation groups filed a lawsuit to challenge the lease sale, seeking further environmental studies and controls.

"At the present time, with energy prices where they are, with the profound effect energy has on our society, we should be opening up these areas," he added.

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GOM REGIONAL DEEPWATER EXPLORATION

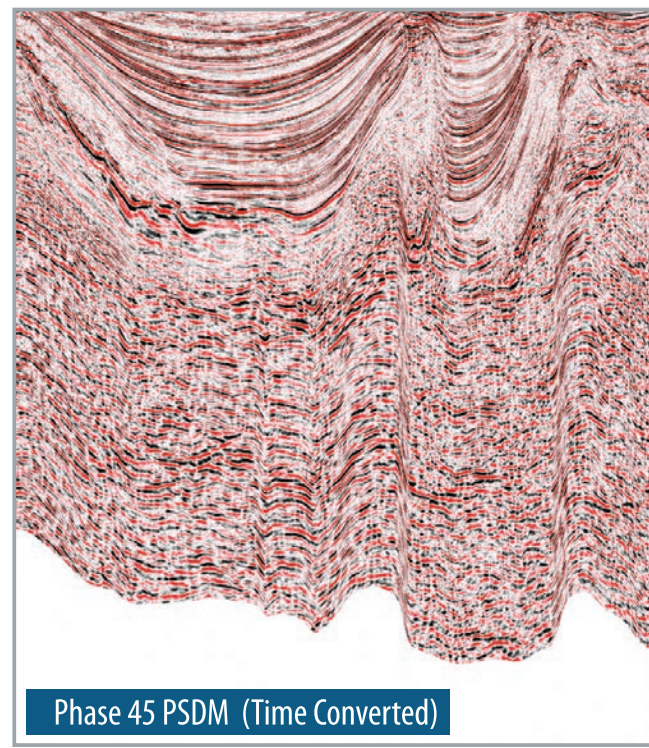
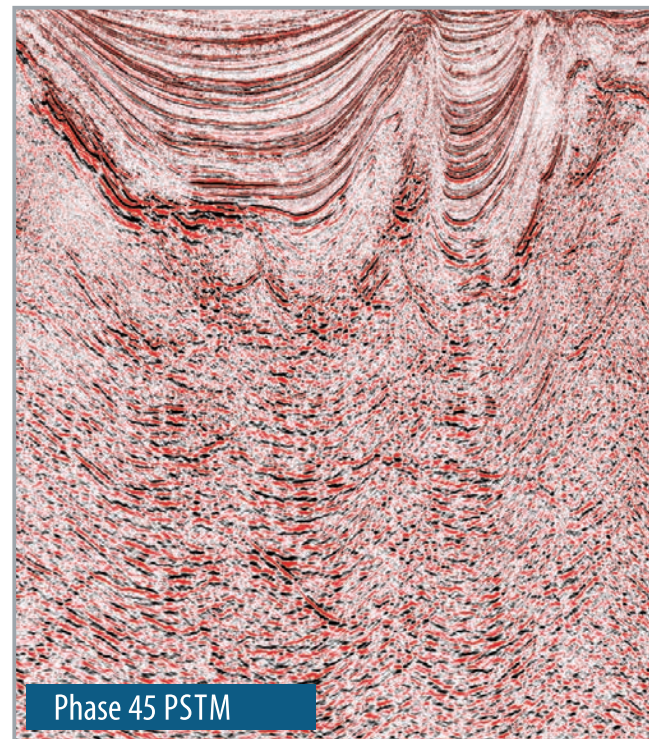
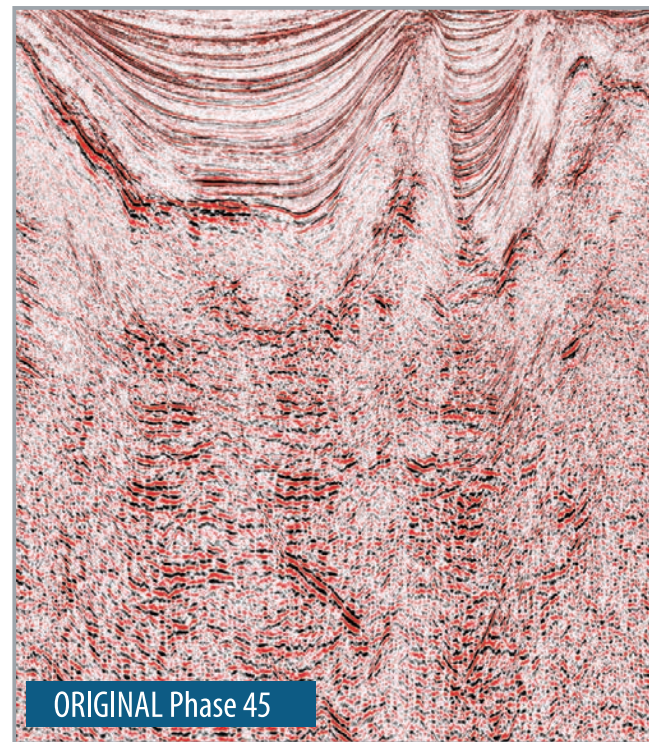
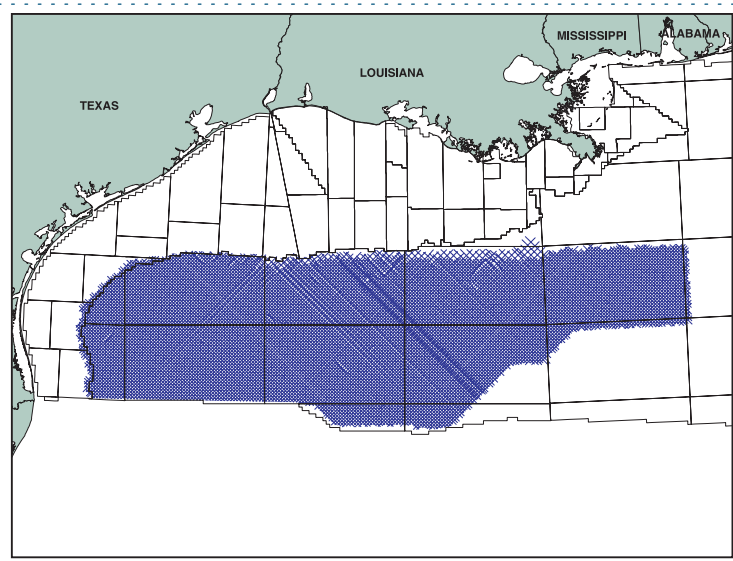
Q. What got you here?

A. ORIGINAL Phase 45

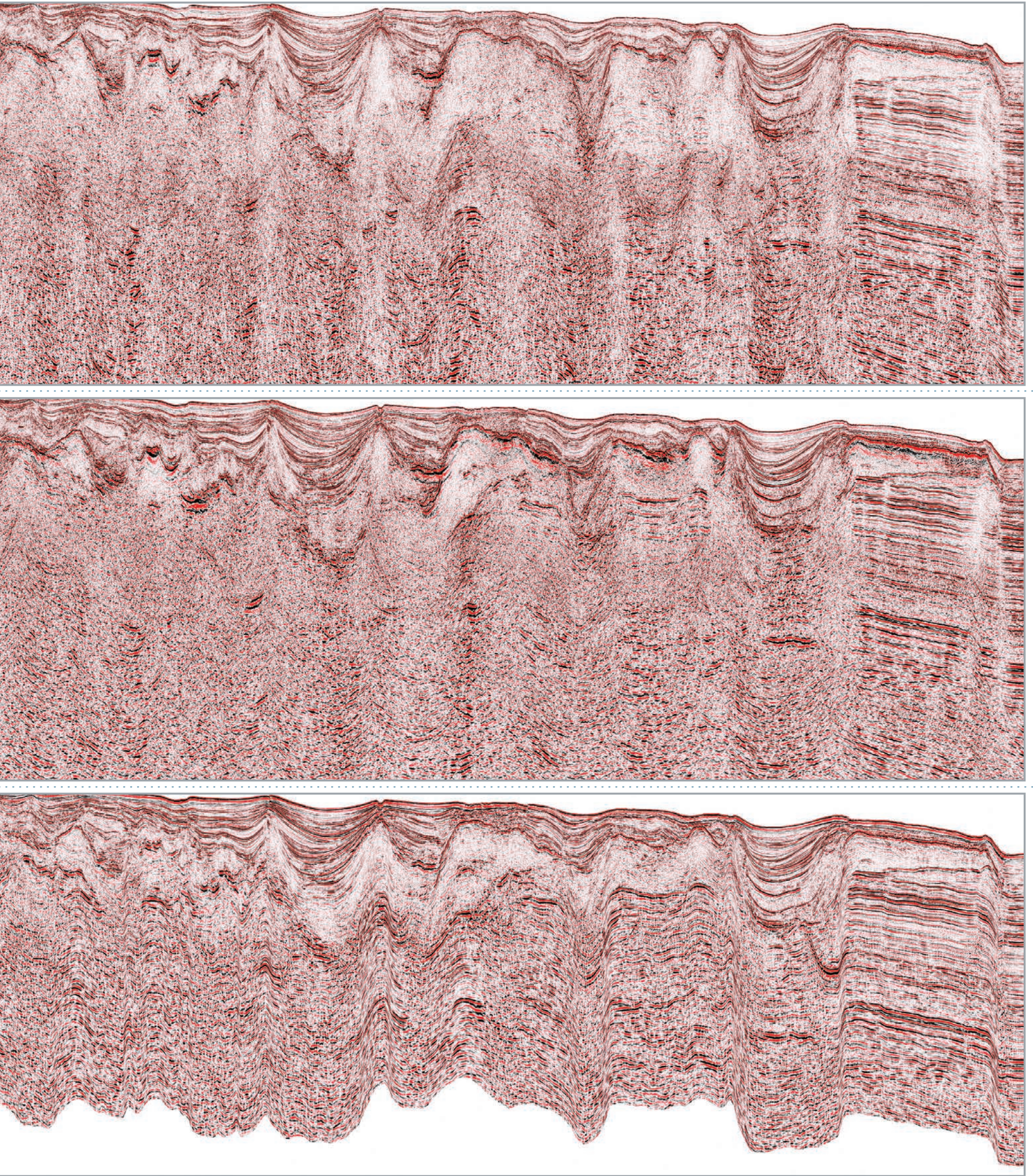
Q. How do you get where you are going?

A. Phase 45 PSTM and Phase 45 PSDM

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WWW.UPDATE

Some Tips for 'Members Only'

By JANET BRISTER
Web Site Editor

Happy New Year!
"New" – what a great word. It smacks of freshness and vitality.

Being the ultimate in "nerdness" at times, I must confess I love new technology, upgrades and new operating systems. It's exciting to explore the new tools and learn what they can do to save time and help me work more efficiently.

Every new thing, however, comes with a price, which usually includes a learning curve.

Well, online dues payments and "members only" access at the AAPG Web site is new. It's upgraded.

The learning curve is in understanding that a login has been established for our membership.

Assure Success

AAPG dues statements are coming soon, and when they arrive many of you will pick up your checkbook or credit cards and manually fill in the appropriate information, pop everything into an envelope and mail it to AAPG.

Some, however, may want to save the postage and time – and our computers can electronically make transactions we once did with pen and ink.

In many cases this will be a first time to use the Members Only section of the AAPG Web site – and as a first-timer, you may think you need to first establish a Web account to get access.

You don't.
You may go to Members Only and position your mouse over "Register Free To Use This Site" – but resist the urge to click that mouse!

All AAPG members have a Web

account. All AAPG members already have free access.

Your user login is your membership number. The next step is to establish a password.

Done!
When setting up the Internet access for our membership, AAPG set a default password of aap123.

Now there's one more temptation on this login page that can stymie your Members Only access. (The "save password" option needs to remain set to "No" until you've established your personal password.) Use the above-mentioned default password, then select "sign on" (gray button on the right) and you will be recognized.

Securing Your Login

Now, you may want to click on all the options there right away to pay dues or look up a fellow member, but before you do, take a few more seconds to assign yourself a personalized password, thereby securing your login for future access.

Simply click on "Review my profile/Change my profile." Again, resist the urge to review this information and click on the gray "security" button just above and to the right of your name. Enter your desired password – and remember, the default (and in this first-timer case) password is "aapg123."

Click the "submit" button and then logout.

You will be returned to the AAPG home page and your personalized password is ready for use.

Select Members Only. Provide your member number, your new password, AND if you wish, you may now choose the "Yes" option for "Save password."

Check Your Cookies

The bits of information computers use to remember each other are called "cookies." The AAPG Web site requires users' computers to accept cookies in order to successfully pass data throughout the interactive features of our site.

If at any point during the above process you do not experience what has been described, check your cookies. If you have turned this feature off in your preferences cookie, turn it on again; acceptance needs to be allowed for aapg.org.

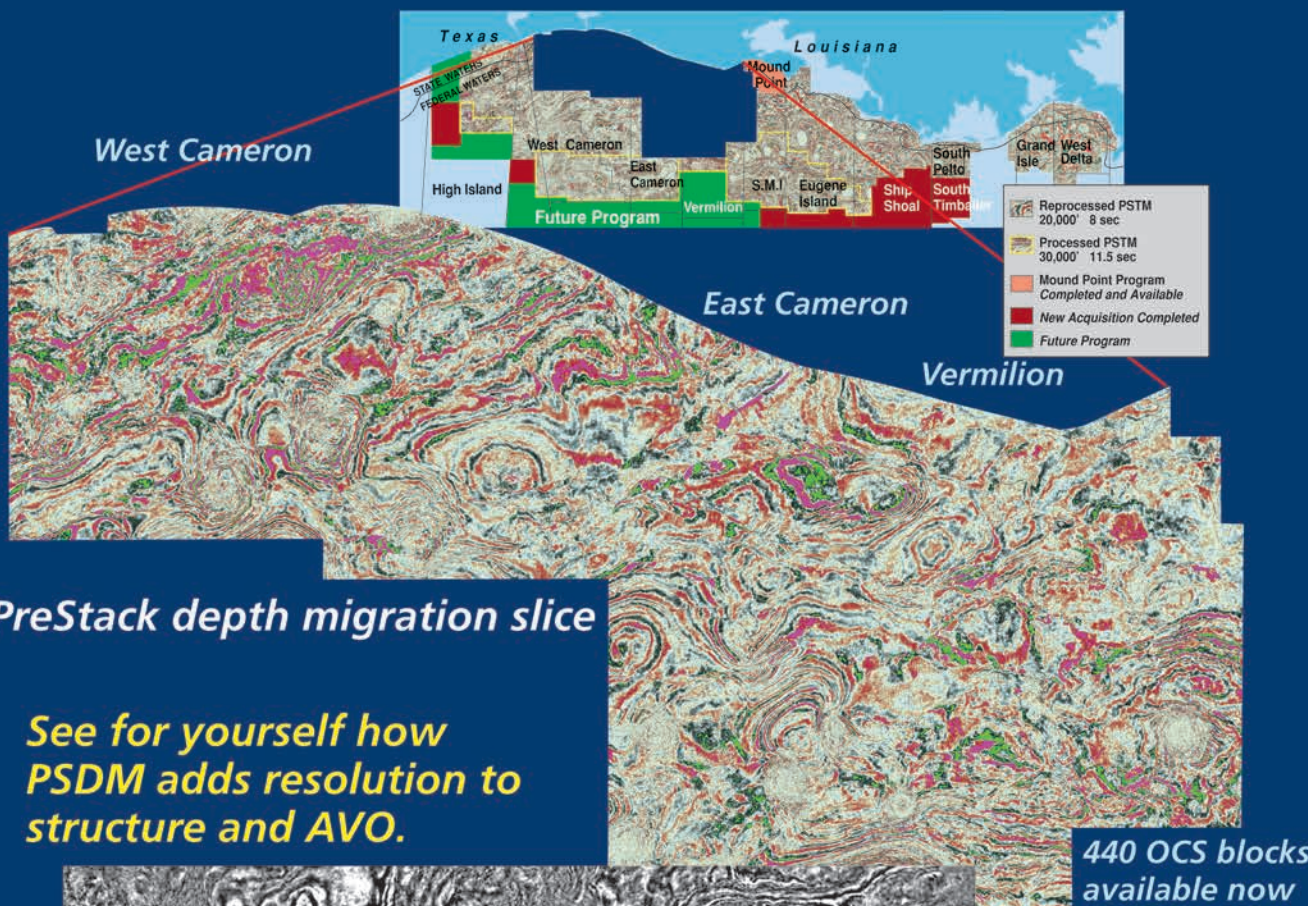
Once you've logged in successfully your link options will include:

- ✓ AAPG Directory.
- ✓ Dues.
- ✓ Online BULLETIN access – archival, current or both.
- ✓ AAPG divisions specific to your division membership status
- ✓ Lost members
Just to name a few.

Should you not see any of the above options you must have not logged in properly and may need some assistance either internally with your system administrator or from AAPG. We're just a phone call away from assuring you access to all AAPG has to offer electronically.

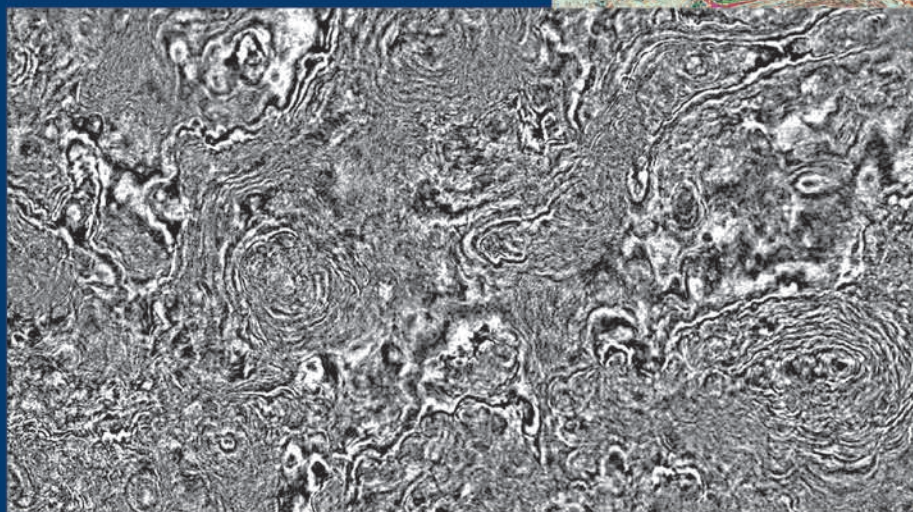
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GEOPHYSICAL CORNER

Don't Abuse Seismic Attributes

(The Geophysical Corner is a regular column in the EXPLORER, edited by Dallas consulting reservoir geophysicist Alistair R. Brown. This month's column deals with "The Use and Abuse of Seismic Attributes.")

By HANS E. SHELIN

Seismic interpretation is a cornerstone of our industry, as interpretation success has grown increasingly dependent on ever-newer combinations of seismic attributes (SAs).

Attributes are simply defined as information extracted or computed from seismic data. What combinations work best depend on reservoir characteristics, the available data and, most importantly, human expertise.

Seismic attributes are not magic, but the explosion of 3-D seismic at the end of the 20th century resulted in dramatic increases in the types, combinations and uses of SAs. We now have available multi-trace, pre-stack, horizon, wavelet and 4-D attributes in addition to those derived from shear wave volumes. These allowed for significant improvements in estimates of reservoir properties from seismic (RPFS).

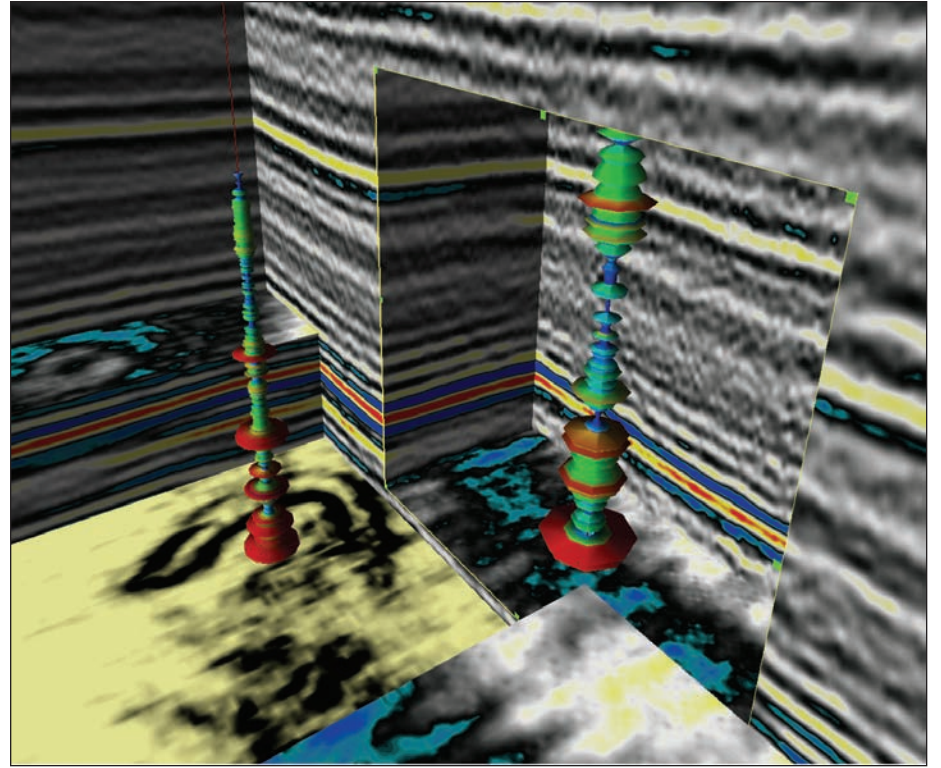
none of the four attributes alone show the sand channel very well – but when they are combined, the result is both quantitatively and areally more accurate than any individual attribute.

This example shows the dramatic potential of SAs for lithology prediction. We add value by using experience to improve estimates of reservoir properties from seismic (RPFS), reducing risk and helping to quantify uncertainty.

Therefore, avoid grabbing the first attribute(s) that seems to work.

Instead, develop a robust, efficient work flow that quickly considers many of the most promising attributes and objectively correlates them with seismically scaled and corrected ground truth. Then model these attributes to understand and optimally guide the SA combination to best estimate the reservoir properties, and quantify the uncertainty of those estimates.

There is also a real danger of using too many SAs to "over-fit" the data. With unlimited attributes – and therefore unlimited degrees of freedom



Graphic courtesy of RSI

Figure 1 – 3-D seismic attributes (SAs) cover almost 100 percent of the subsurface cost effectively, better tie well control and allow predictions of reservoir properties.

continued on next page

* * *

The accompanying table defines terms used in seismic attribute analysis today.

The explosion of potentially useful attributes requires seismic interpreters to keep current and to have the most effective efficient "fit for purpose" work flows. One important aspect of these work flows is "starting with the end in mind." For example, if amplitudes or wide azimuths are critical, the seismic acquisition and processing for those SAs should be optimized.

Unfortunately, the potential for abusing seismic attributes also has increased. One common abuse of seismic attributes often occurs "because it's there." Interpreters today have access to many SAs on their workstations, but often have very little time to properly understand these attributes, model them and correctly correlate them with ground truth and the principles of physics.

Be wary of pretty SAs that are not well understood. This can damage your credibility while tarnishing the true potential of SAs. Don't expect your workstation to pop out the solution.

Be wary of "black box" answers. Instead, commit the resources to correlate, model and understand your SAs, and what they can and cannot do.

Workstations now make it very easy to generate, for example, the third derivative of the instantaneous phase or the second derivative of instantaneous frequency. Even if this SA correlates with ground truth somehow, will you understand it or trust its significance?

Another abused shortcut often sounds like: "Just give me the one attribute that solves my problem."

In some unusual areas, interpreters have been able to succeed using only a single attribute interpretation. However, I have not yet found an area where a single attribute provides the optimum answer.

Note in figure 2 (see page 23) how

Seismic Attribute Categories:	Examples:	Comments:
P-Wave	PP reflection Data	All SAs unless specified
S-Wave	Psv, Mode Converted	Can give Bi-refringence
Pre-Stack	AVA(Amplitude vs. Angle) AVO(Amp. vs. Offset), Attenuation (Q), Azimuth, stacking Velocities, frequency, scattering, dispersion	More data intensive; requires more seismic knowledge & analysis; Can yield: direct Hydrocarbon Indicators (DHIs), geo-pressure, anisotropy, pore throat information
Post-Stack	Horizon & Window attributes, Spectral decomposition	Smaller 3-D Data Volumes, quicker, easier, more common & convenient
Single Trace	Freq., Phase, Amplitude	Early Attributes, easier to generate and model
Multi Trace	Coherence, Dip, Continuity,	Useful for Lithology, geo-body, fracture
2-D	Pre-stack, Post-Stack	Limited to single trace or 2-D multi-trace
3-D	Geometric Volumes, Sequence Stratigraphy, Coherency, Azimuth	The biggest growth area, better well ties, Used w/ visualization & statistical software
Time Lapse (4-D)	Re-shooting 3-D, & Analyzing differences vs. time	Useful for identifying fluid changes and for Reservoir Simulation matching
Mathematical	Most Attributes: Dip, "Fluid Factor"	Math function applied to data
Extracted	Horizon or Window Attributes	Dependent on the horizon interpretation accuracy & calculated attribute volume
Wavelet	StratiMagic®, RSI®	Wavelet shape can infer facies, in Map or Volume outputs
SA Analysis methods:	Examples:	Comments:
Supervised	Interpreter Input, pattern recognition, Emerge®	Used more when well data is available, can be used with a probabilistic method.
Unsupervised	Unbiased Mathematics, PCA	Often an interesting check of assumptions
Inversion	Pre. vs. Post, Model vs. Not	Many varieties, choose "fit for purpose"
Statistics	Typically SAs are correlated with Well Properties of interest	Can be very useful IF used correctly, seismic to well ties, modeling, & scaling are critical
Neural Networks	See Below, Figure 2	One useful method of combining data
Principle Component Analysis (PCA)	Mathematically grouping data by the eigenvalues of the covariance matrix	Coherent energy~PC1= largest eigenvalue of the Covariance Matrix. Often difficult to understand the physical significance. Can show discontinuities
Kohonen, Self Organizing Map (SOM)	RSI's Lithann® (fig.2), Stratimagic®, SeisClass®, dGB's Detect®	Another popular and useful method of combining data

Table 1

continued from previous page

– statistical accidents will occur. The critical step is testing for significance – for example, by blindly dropping one well or zone at a time. The number of attributes ideal for reservoir property estimation typically varies from two to four, depending on the area, data and objective.

Case History Example

Despite the pitfalls in seismic attribute analysis (SAA), there are many successful examples of predicting RPFs. For example, consider figure 2: It is often important and valuable to define the 3-D extent of a channel or sand body. Figure 2 shows an example of combining four 3-D attribute volumes along with the appropriate well information to predict lithology.

Once you've optimized your SAA workflow, it can dramatically improve property and risk estimates. Robust work flows have been developed on data sets around the world, in clastic and carbonate environments, onshore and offshore. The accuracy of estimates varies with location, data quality and objectives.

The speed and accuracy of reservoir modeling and simulation has also been improved using RPFs estimates and associated uncertainty cubes.

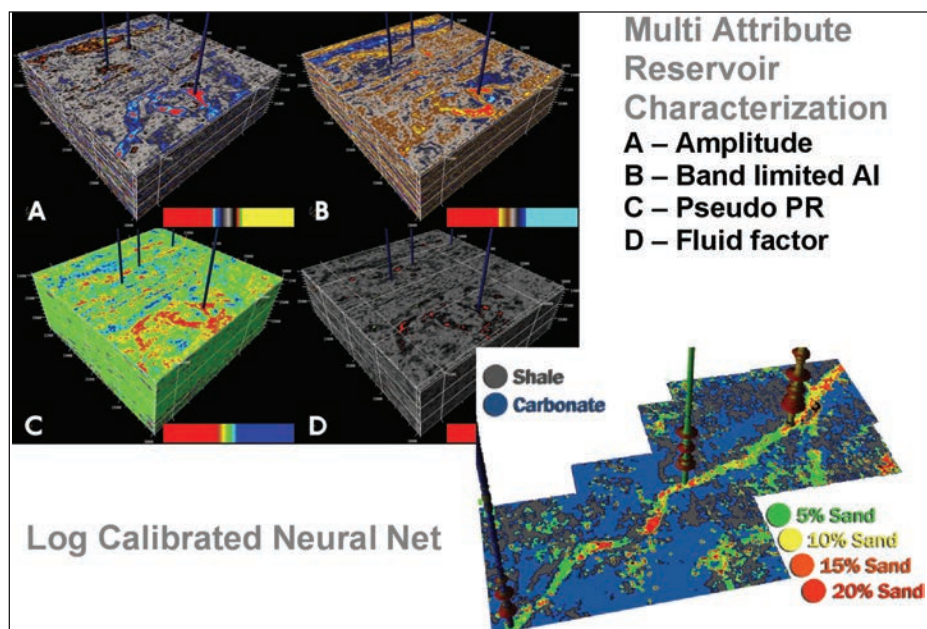
Recommendations

- ✓ Keep up-to-date on seismic attributes, SA analysis and work flows.
- ✓ Edit and scale well data to ensure appropriate ground truth ties to the seismic, including positioning, scaling, wavelet and phase issues.
- ✓ Understand the physics and significance of SAs by forward modeling. For example, testing the sensitivity to varying thickness or fluid substitution.
- ✓ Avoid known abuses or pitfalls, including assuming well data is ground truth; sloppy ties; "because it's there"; black boxes; endless SA derivatives; single attribute obsession; over-fitting; and not blind testing for significance.
- ✓ Determine the most useful SAs, input cubes and SAA methods for your objectives, and how accurate your RPFs estimates are.
- ✓ Optimize your critical SAs, when appropriate, by acquiring/processing 3-D seismic proactively.
- ✓ Communicate uncertainty via uncertainty cubes.

(Editor's note: Hans Sheline, an AAPG member, is with VeriNova in Houston.)

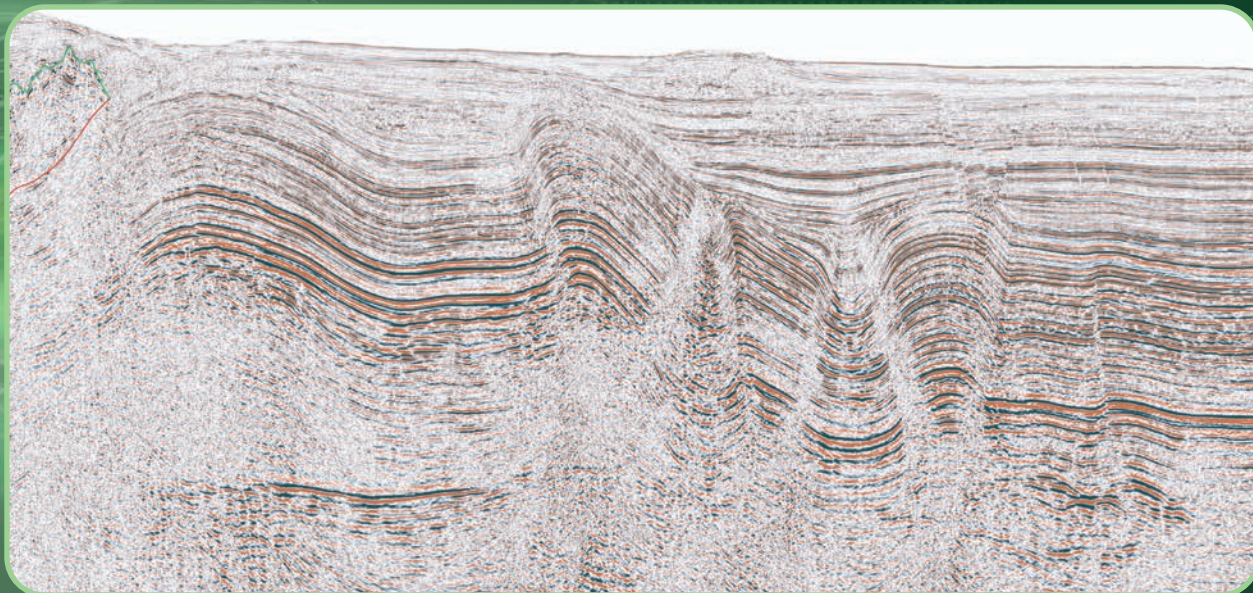
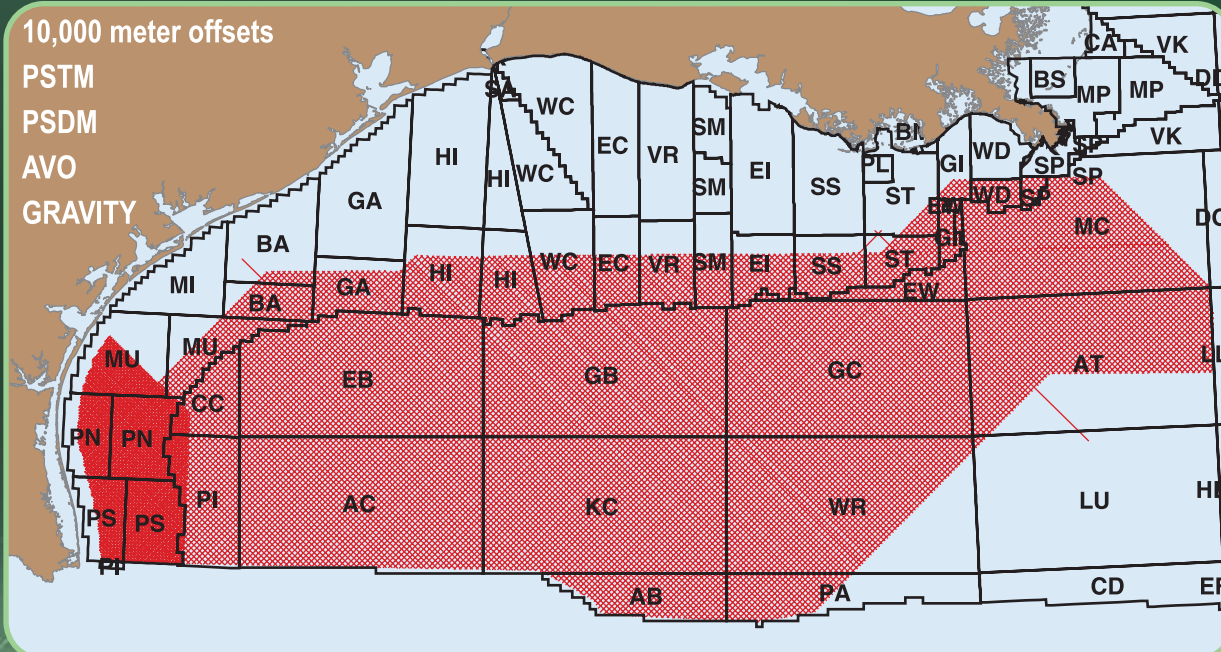
Figure 2 – Correctly combining more than one 3-D seismic attribute volume usually improves the resulting reservoir property from seismic (RPFs) estimate.

Graphic courtesy of Anadarko and Rock Solid Images



Deep Focus...

A new long offset regional survey in the Gulf of Mexico



Alaminos Canyon Depth

For additional details on this program, please contact:

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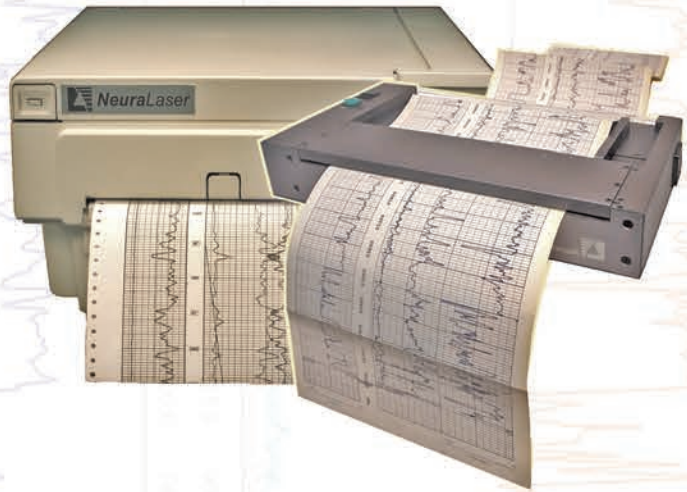
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MEETINGS OF NOTE

2005 U.S. Meetings

April 10-13, Southwest Section, AAPG, annual meeting, Fredericksburg, Texas.
April 22-29, AAPG Hedberg Conference, "Understanding, Exploring and Developing Tight Gas Sands," Vail, Colo.
April 29-May 1, AAPG Pacific Section, annual meeting, San Jose, Calif.
June 19-22, AAPG Annual Convention, Calgary, Canada.
Sept. 11-14, Mid-Continent Section, AAPG, annual meeting, Oklahoma City.
Sept. 18-20, Eastern Section, AAPG,

annual meeting, Morgantown, W.Va.

Sept. 24-26, Rocky Mountain Section, AAPG, annual meeting, Snow King Resort, Jackson, Wyo.

Sept. 25-27, GCAGS, AAPG, annual meeting, New Orleans.

Oct. 12-15, AAPG Foundation Trustee Associates, Branson, Mo.

2005 International Meetings

March 1-3, APPEX London (AAPG Prospect and Property Exposition), London.

Sept. 11-14, AAPG International Conference and Exhibition, Paris, France. □

FOUNDATION UPDATE

Foundation (General)

Rashidah Abdul Karim
Victor F. Agbe-Davies
Akinola Joseph Ajayi
William Casey Armstrong
Daniel Nelson Behringer
Michael Edward Bullen
Joao Euclides Cardoso-Neto
Robert Lee Cash
In memory of Lewis G. "Bud" Fearing
Jason Wellington Currie
Matthew Czerniak
William Ronald Dixon
Eric Allan Erslev
Richard E. Faggioli
John Ross Gaither
James A. Gibbs
In memory of Robert J. Beams
David Thomas Grace
Tommy Halvorsen
Ann Marie Harris
Norman Harthill
Andreas Hoie
Ukachukwu Chijioke James
Miguel Lopez-Blanco
Andrew John Lydyard
Shelley Dawn Miller
Richard Newport
Leslie Owen Niemi
Frances W. Pierce
Adriana Raileanu
Peter Robert Rose
In memory of Keith Preston Young
Ronald M. Tisdale
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Willard Lynn Watney
Peter George Wilson

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Distinguished Lecture Fund
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Eugene F. Reid Diblee Fund

Richard E. Faggioli
Harry Ptasynski
In memory of Thomas Wilson Diblee

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Digital Products Fund

Gary Wayne Ford
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K-12 Education Fund

Paul H. Dudley Jr.
*In memory of Mason Hill
and Paul Dudley Sr.*
Harvey E.A. Lorenzetti

Grants-in-Aid Fund

Thomas Glenn Fails Jr.
Donald Leroy Hansen
In memory of Marvin Davis
Nedra Keller Hansen
In memory of Kenneth Keller
Ukachukwu Chijioke James

Gustavus E. Archie Memorial Grant

Michael A. Cervantes

Peter W. Gester Memorial Grant

John H. Silcox
In memory of Robert Kropschot

Michel T. Halbouty Memorial Grant

Frank Kell Cahoon
Alfred Townes Carleton Jr.
Robert D. Cowdery
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scott.schad@newdominion.net

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PROFESSIONAL NEWS BRIEFS

Blaine Campbell, to supervisor, Greater Kuparuk Area (GKA) Geoscience, ConocoPhillips Alaska, Anchorage, Alaska. Previously senior staff geophysicist, ConocoPhillips Alaska, Anchorage.

Kenneth O. Daniel, to vice president-geology/partner, Ovation Energy II GP, North Richland Hills, Texas. Previously partner/geologist, San Saba Resources, Arlington, Texas.

Craig A. Edmonds, to senior geologist, Dominion Exploration and Production, Jane Lew, W.Va. Previously geologist, Dominion Exploration and Production, Jane Lew.

Deborah Humphreville, to recruitment account manager, Working Smart Ltd., Woking, England. Previously business development manager, Veritas DGC, London, England.

Jeannine Perrot, geological and geophysical software applications and technical writer, Seismic Micro-Technology, Houston. Previously trainer, Landmark Graphics, Houston.

Robert A. Phelps, to vice president-exploration, Caribou Resources, Calgary, Canada. Previously geological consultant, Vintage Petroleum Canada, Calgary, Canada.

C. Wylie Poag, to scientist emeritus, U.S. Geological Survey, Woods Hole, Mass. Previously research geologist, U.S. Geological Survey, Woods Hole, Mass.

Wolfgang E. Schollnberger has received the 2004 outstanding individual achievement award by the Energy Institute, London, for his lifetime professional accomplishments. Schollnberger is with BP, Houston.

John H. Schuenemeyer has received the 2004 John Cedric Griffiths Award for excellence in teaching mathematical geology by the International Association for Mathematical Geology. Schuenemeyer is with Southwest Statistical Consulting, Cortez, Colo.

Mark Sonnenfeld, to regional geological manager, Permian Basin, Whiting Petroleum Corp., Denver. Previously director of geology, iReservoir.com, Denver.

Mark Webster, to chief petroleum geologist, Ministry of Economic Development, Wellington, New Zealand. Previously manager exploration, Santos, Brisbane, Australia.

(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.)

LOOKING BACK

Thesis a Good Success Marker

By **MARLAN DOWNEY**

The best guide to the future is history.

Many years ago I reviewed the criteria being used by Shell Oil to hire its new geologists. Shell's hiring emphasized graduate students with top grades from selected universities.

In reviewing the outcome of its hiring practices, I found that having outstanding grades and attending Ivy League schools made no difference to success at Shell; indeed, the "best" recruits were as likely to end up at the bottom of the Shell value order list as

the top.

We wanted to find new criteria for hiring that provided us with a higher proportion of outstanding people.

One of the parameters that did seem to correlate to future outstanding performance was the quality and originality displayed in the graduate thesis of the prospective new hire.

Such an outstanding masters thesis by a then-young geologist was published in the January 1955 AAPG BULLETIN, titled "Pennsylvanian Conglomerates, Structure and Orogenic History of Lake Classen Area, Arbuckle

Mountains, Oklahoma."

The paper combines excellent field observations with thoughtful analysis; was clearly written and well documented; and after 50 years is still worth reading.

From this early history of performance, R.J. (Bob) Dunham went on to an outstanding career as a carbonate researcher at Shell and influenced thousands of petroleum geologists with his innovative ideas.

I'd like to suggest that a careful thesis review may be a fine way to hire your next great geologist. □

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INTERNATIONAL BULLETIN BOARD

(Editor's note: This column is for international items of note to the AAPG.

News items, press releases and other information should be submitted to the EXPLORER/International Bulletin Board, P.O. Box 979, Tulsa, Okla. 74101; telephone – 918-560-2616; fax – 918-560-2684; or e-mail – dfree@aapg.org.

This report was prepared by Mike Lakin, with Envoi Ltd. in London, England, who is a member of the APPEX-London Organizing Committee and vice president of the AAPG European Region.)

I make no bones about my intentions here to promote AAPG's fourth annual APPEX-London, an international upstream oil and gas prospect fair that is a "must attend" for active international players from the majors to startups!

This year's APPEX-London will be held Feb. 28-March 3 at the Ibis Hotel in West London.

One might argue that there are plenty of conferences to attend – but how many of them are specifically about trading and funding international prospects and opportunity?

This meeting, to my knowledge, is the only truly international and cost-effective association-driven exposition (other than opportunity, which will always be done on the back of the complementary association shows that are generally technical and engineering forums).

Having been involved on the London organizing committee for the last few years – and also from experience as an exhibitor and active international deal agent the last 15 years – I have no doubt that the event is likely to become an essential "business forum" for the world's

key international decision makers (as NAPE is to North American deal-making).

Unstoppable

The development and evolution of APPEX has been an interesting story.

AAPG's original Prospect and Property Expo was first held in Houston in 2001; the concept was then taken to London the following year. The event grew each year. After last September's Houston event an agreement was announced between AAPG and AAPL whereby the two organizations will join forces with NAPE in the United States and Canada.

The APPEX brand is far from lost though, because APPEX-London is now set for an expansion that will make it AAPG's international deal-making event.

APPEX should be added to the diary each year as an annual event for the beginning of March!

The Evidence

Last year's APPEX-London was a turning point for the event, as the show went independent.

The feedback from some of the 350-plus attendees and the various deals that



were done as a result speak for themselves. Exhibitors were seen networking and presenting international projects at tables in the extended breaks designed to promote networking time.

I know of at least one deal that was funded as a result of its introduction at APPEX 2004, because it was an Envoi deal that got done!

It's not for me to state who else did deals, but I know that several others happened as a result. I also know one key senior vice president of new ventures who told me that it was one of the best events he'd been to for the number of key and equivalent people with whom he was able to talk directly about activities and opportunity.

This Year's Program

This year's showcase exhibition hall

Planning Begins for Perth 2006

It's not too soon to start thinking about Perth and the 2006 AAPG International Conference and Exhibition.

"Reunite Gondwana – Realize the Potential" is the theme for the meeting, set Oct. 22-25 in the Western Australia capital. Hosts will be the Petroleum

Exploration Society of Australia (PESA).

Organizers already are planning for an exciting technical program, highlighted by a wide array of exotic field trips.

Watch the EXPLORER and go online to www.aapg.org for updated information.

Oil & Gas Research Opportunities in Australia

The newly-established Western Australian Energy Research Alliance (WA:ERA) is a joint venture between CSIRO Petroleum, Curtin University of Technology and The University of Western Australia.

Based at the Australian Resources Research Centre (ARRC), within Perth's Technology Park, the Alliance is Australia's principal oil & gas research centre with an existing capability of 250 specialists.

Working in partnership with companies and government as part of Western Australia's expanding energy sector, WA:ERA is rapidly developing into one of the world's leading, and easily accessible, oil & gas research organisations.

The Western Australian Government, through the award of a major research facilities grant, is supporting a further expansion of joint venture capability targeted at:

SUBSURFACE & PRODUCTION TECHNOLOGIES

- Geophysics, Reservoir Characterisation and Engineering, Production, Petroleum Geoscience, Geo-engineering, Rock Physics, Reservoir Simulations

NATURAL GAS TECHNOLOGIES

- Chemists and/or Chemical Engineers with interests in applied organic chemistry and the use of heterogeneous catalysts

SUBSEA, PROCESS & DRILLING SYSTEMS

- Drilling and Completion Engineering, Geo-mechanics: Wellbore Stability and Sand Management, Drilling Mechanics, Drilling Fluids, Production Technology & Processes, Production Fluid Mechanics, Production Chemistry, Information Management and Artificial Intelligence, Reservoir Engineering, Production Geology, Petrophysics

WA:ERA is seeking expressions of interest from talented, energetic researchers, research project leaders and research business development specialists to enhance our capabilities in these research areas.

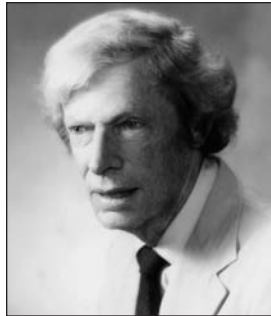
If you have relevant experience and would like to contribute to WA:ERA's research objectives, please email your CV and a covering letter in confidence to careers@waera.com.au or submit via <http://www.waera.com.au/careers>



INMEMORY

Renowned field geologist and mapping legend Thomas Wilson Dibblee Jr., died Nov. 17 at his Santa Barbara, Calif., home. He was 93.

Dibblee created maps for almost 40,000 square miles of California, including areas of the Mojave Desert and the Imperial and Coast ranges. His knowledge of regional stratigraphy, structure and paleontology has been basic to understanding much of California's geology.



Dibblee

Dibblee, who attended Stanford University, joined Union Oil Co. in 1936 and a year later joined the Richfield Oil Co. and began a career of mapping areas in California.

From one of his maps, a Richland wildcat discovered the Cuyama oil field – and they named the oil zone the Dibblee Formation.

In 1952 he began his second career – mapping for the U.S. Geological Survey, where he and a friend, the late AAPG member Mason T. Hill, co-authored a paper in 1953 suggesting that the San Andreas Fault had moved north to south by almost 350 miles. The paper became a fundamental part of research into plate tectonics.

Dibblee received the AAPG Michel T. Halbouty Human Needs Award in 1981 and AAPG Honorary Membership in 1996.

In his honor, the AAPG Foundation has established a Thomas W. Dibblee Grant to provide scholarships for students with an emphasis on field mapping. Contributions may be made to the AAPG Foundation, Attention: Diane Keim, P.O. Box 979, Tulsa, Okla. 74101-0979; or may be made by telephone to (918) 584-2555, or by fax to (918) 560-2642.

Contributions also may be made to the Dibblee Geological Center at the Santa Barbara Museum of Natural History, where Dibblee was still active in his editing of maps about two weeks before his death. Those contributions may be forwarded to the Dibblee Geological Center, Santa Barbara Museum of Natural History.

Alfred Joseph Deschamps, 81
Houston, Oct. 8, 2004

Thomas Wilson Dibblee Jr., 93
Santa Barbara, Calif., Nov. 17, 2004

Jean Jacques Dozy, 96
The Hague, Netherlands, Nov. 1, 2004

Michael Dean Hatley, 50
Houston, June 26, 2004

John Humphreys Hoke, 78
Costa Smeralda, Italy
Sept. 18, 2004

Robert E. Kropschot, 73
Port Huron, Mich., Nov. 19, 2004

Leonard Allen Nelson, 81
Sedalia, Colo., Nov. 3, 2004

Thomas E. Pawel, 78
San Antonio, August 2004

William Joseph Winegard, 54
Richmondville, N.Y.
Sept. 16, 2004

(Editor's note: "In Memory" listings are based on information received from the AAPG membership department.)

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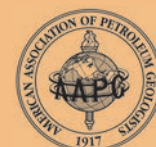


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www.aapg.org/paris/

Paris Abstract Deadline Due

Here's an important reminder: The deadline for abstracts for the 2005 AAPG International Conference and Exhibition is Jan. 12.

This year's meeting will be held Sept. 11-14 in Paris, France, at the CNIT Conference and Exhibition Centre. The meeting theme is "New

Tracks to New Highs," and will revolve around three themes: "New Insights Into Petroleum Provinces," "New Tracks in E&P Activity" and "New Techniques and Concepts – Addressing New Challenges."

Abstracts can be submitted online at www.aapg.org/paris/. □

DPA, EMD Sets Slates For Officer Candidates

Two of AAPG's divisions have announced officer candidates for 2005-06. Ballots will be mailed in January. Those elected will assume office on July 1.

The candidates are:

Division of Professional Affairs

President-elect

□ Rick L. Ericksen, State Board of Registered Professional Geologists, Jackson, Miss.

□ Richard G. Green, LaRoche Petroleum Consultants, Dallas.

Vice President

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

□ Debra Rutan, CrownQuest Operating, Midland, Texas.

Secretary

□ James M. Hill, Tartan Energy, Camarillo, Calif.

□ Craig W. Reynolds, Cobra Oil & Gas, Wichita Falls, Texas.

Energy Minerals Division

President-elect

□ William Ambrose, Bureau of Economic Geology, Austin, Texas.

□ Arthur Johnson, Hydrate Energy International, Kenner, La.

Vice President

□ Creties Jenkins, DeGolyer & MacNaughton, Dallas.

□ Douglas Ratcliff, Bureau of Economic Geology, Austin, Texas.

Treasurer

□ David Newell, Kansas Geological Survey, Lawrence, Kan.

□ Frances Pierce, U.S. Geological Survey, Reston, Va.

Additionally, the following will stand for election unopposed as councillors of their section or region. They are Mike Wiley, Gulf Coast; Rick Richardson, Canada; and Jeffrey Levine, Southwest. □



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Plutons and Host Rocks in the Sierra Nevada

For more information and online abstract submission visit

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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.)

For Active Membership

Colorado

Green, John B., Hampton, Waechter & Associates, Centennial (reinstated); Lombardi, Tracy E., Ticora Geosciences, Arvada (B.J. Cardott, G.B.C. Young, B.S. Kelso)

Massachusetts

Bingham, Michael Paul, Corporate Environmental Advisors, West Boylston (reinstated)

Oklahoma

Robertson, Thomas P. Jr., Shoot the Moon Exploration, Oklahoma City (R.C. Callan Jr., G.A. Wilson, J. Marshall)

Texas

Zak, Anthony Wayne, ECL, Houston (M.J. Zak, T. Hurley, R.T. Dick)

Canada

Thompson, Brett, Penn West Petroleum,

Calgary (D.J. Brooks, D.J. Rae, E. Unger)

Nigeria

Orubiri-Bokolo, Diongudogiyo Anthony, Nigerian Agip Exploration (NAE), Port Harcourt (I.T. Sindiku, B. Olaleye, O.C. Iwobi)

South Africa

Fouche, Jordaan, Industrial Development Corp., Cape Town (G.J. Brink, E.M. Wood, J.H.G. Keenan)

Spain

Mozetic, Marcos E., Repsol YPF, Madrid (reinstated)

Sweden

C. De Caprona, Guy, GMD, Gothenburg (reinstated)

Certification

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

Petroleum Geologist

Michigan

Matson, Murray M., West Bay Exploration, Traverse City (T.B. Hoane, P. MacKenzie, L. Wickstrom)

Texas

Remmert, Glenn W., Cambridge Associates, The Woodlands (reinstatement) □

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APPEX London 2005

Schedule of Events

Monday Afternoon, 28 February: COMPLIMENTARY FINANCE FORUM AND EXPO – Limited seating – make your reservations early

Tuesday, 1 March: GLOBAL PERSPECTIVES FORUM AND EXPO – EUROPE/UK DAY AND INVESTMENT OPPORTUNITIES

Wednesday, 2 March: GLOBAL PERSPECTIVES FORUM AND EXPO – GLOBAL OIL AND GLOBAL GAS SUPPLY ISSUES AND INVESTMENT OPPORTUNITIES

Thursday, 3 March: GLOBAL PERSPECTIVES FORUM AND EXPO – E&P HOTSPOTS: HIGH-RISK/HIGH-REWARD OPPORTUNITIES, DEEPWATER AND FRONTIERS, AND SPECIAL EXECUTIVE PANEL SESSION

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Commentary

Arctic Warming Report Flawed

By LEE C. GERHARD

A report in November from a group of students of the Arctic, "Arctic Climate Impact Assessment (ACIA) 2004," projects that warming of the Arctic will lead to disastrous results for indigenous people and animals.

Unfortunately, the report and its press release are internally inconsistent and based on false assumptions and previously identified inaccurate research.

The report argues:

✓ Winter temperatures in part of the Arctic have risen over the last 50 years.

✓ Temperature rise is the result of human fossil fuel consumption (see figure 1) – a view challenged by Khilyuk and Chilingar, and myself.

✓ The temperature rise will accelerate over the next decades.

✓ If their scenario is correct, that the inevitable result will be melting of the Greenland ice sheet and flooding of the world's low-lying coasts.

The conclusions are based on the assumptions that:

✓ The 2000 Intergovernmental Panel on Climate Change report was correct.

✓ All of the temperature data around the Arctic are of similar quality.

✓ The computer models used to make temperature projections accurately simulate the processes at work and correctly project those 100 years into the future.

As the basis for the ACIA warming scenario, the validity of the IPCC report is fundamental to the analysis performed by the ACIA. The IPCC report, which

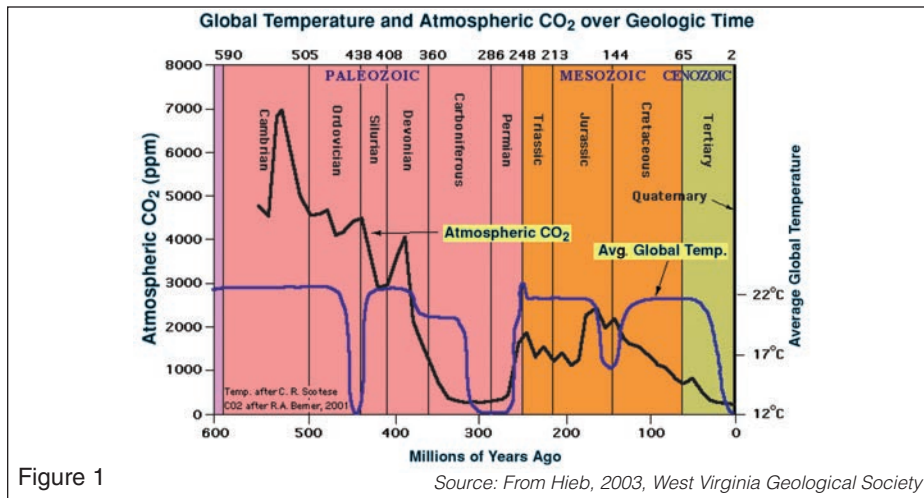


Figure 1

Source: From Hieb, 2003, West Virginia Geological Society

assigned global climate change to human emissions from fossil fuel use and agriculture, is presently being challenged by results from an array of studies on the influence of variables such as solar irradiance. Not least of these is a fundamental and critical reanalysis of the work by Mann et al (1999), which provided the basis for the interpretation of recent accelerated heating.

This piece of research flew against recorded human history (Lamb 1995) and was questioned by reviewers of the IPCC draft – but not only was it included by the IPCC, it became the centerpiece for concluding that there was discernible human influence on climate.

Recent literature has discredited that report and thus, the IPCC conclusion (Esper et al 2002; Soon et al, 2003;

McIntyre and McKittrick, 2004).

* * *

Temperature data varies in quality around the Arctic.

While data of Canada and the United States may be of good quality and internally consistent, there is question about the data quality of the former Soviet Union. The closing of weather stations there and the degradation of data consistency – and possibly quality – raises concerns about the surface station database used to determine recent temperature changes.

Temperature data compiled for the Mys Smidta station on Russia's east Arctic coast (table 1) illustrates the nature of data reported and used for some Arctic

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	-28.7	-31.1	-21.2	-8.3	-2.6	2.1	4.1	4.9	0.3	-7.3	-15.1	-26.3
1991	-25.2	-27.6	-24.3	-16.8	-3.3	ND	4.8	4.4	1.1	-4.9	-12	-20.3
1992	-26.3	-26	ND	-15.3	-5.1	ND	6.2	3.9	-1.7	-10.2	-16.6	-24.6
1993	-19.4	ND	ND	ND	-6	3	7.9	ND	ND	-7.8	ND	-27
1994	-26.3	-27.7	-28.3	-19.7	-7.9	ND	2.8	3.5	-1.1	-12.3	-22.2	-27.2
1995	-21.9	-25.9	-24.9	-16.7	-4.7	1	3.9	4.2	ND	-6.3	-9.3	-22.9
1996	-20.5	-25.9	-15.6	-18.4	-1.9	3.2	3.4	3.4	-0.1	-8	-11.8	-21.1
1997	-25.7	ND	ND	ND	ND	ND	ND	5.6	0.2	-7.4	ND	-29
1998	-27.4	-29.5	-22.9	-18.4	-8.7	1.3	ND	1.5	-0.3	-5	-14.2	-21.7
1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	-11.7	ND	-27.3

Table 1

locations in the last decade. In addition, although the ACIA report concludes that there is general warming, the report illustrates for the central and eastern Canadian Arctic, Greenland and the adjacent seas (Sub-Region IV) that temperatures have cooled by 2 degrees Celsius over the last 50 years.

This suggests that the temperature variability does not reflect a global or polar trend, but rather can be related to data issues and redistribution of heat.

Adverse impact projections for these areas that data indicate cooling are based solely on computer models that predict warming of 4-7 degrees Celsius.

All of the ACIA projections are based on forward computer models, and therefore the accuracy and reliability of these models are crucial to conclusions drawn from their projections.

See **Commentary**, page 33

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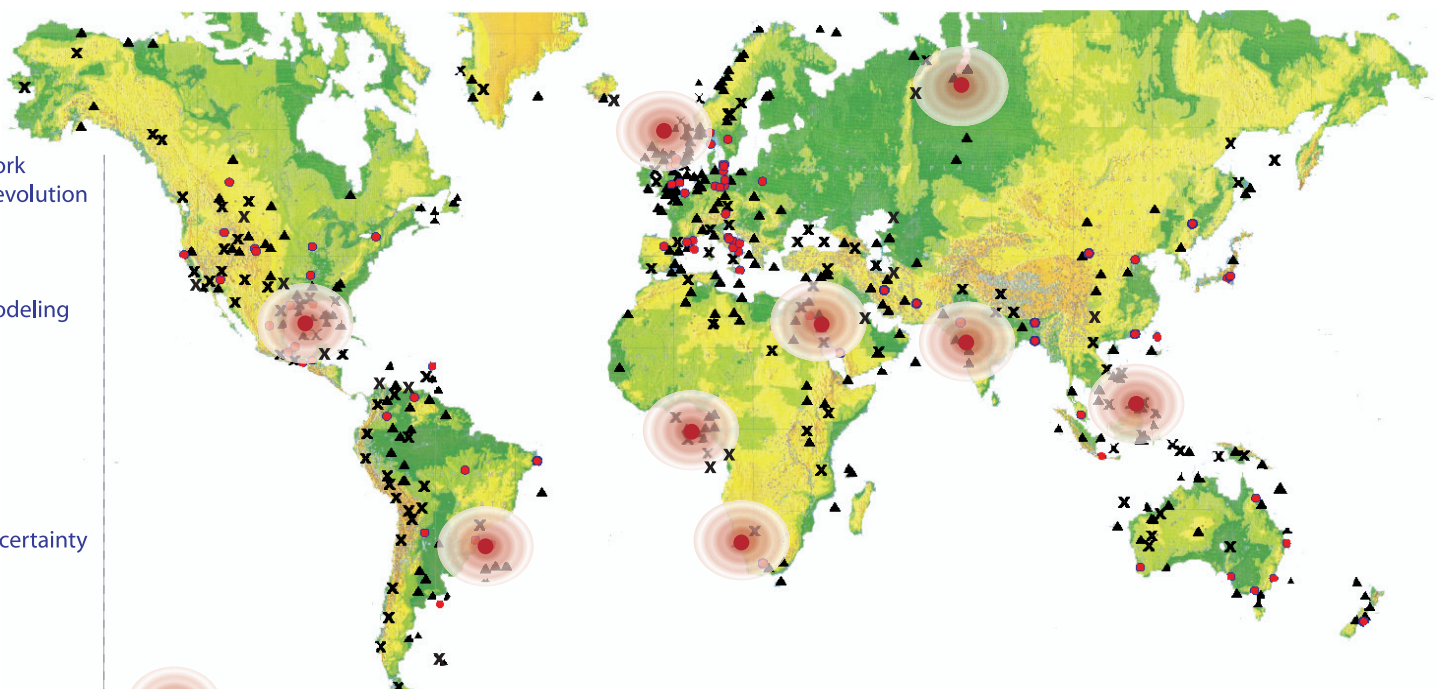
- 3D structural model to feed basin modeling
- Burial history
- Palinspastic reconstruction
- Pinpoint salt weld timing
- Charge timing
- Fault movement

Reservoir distribution models:

- Define reservoir presence/quality uncertainty
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February EXPLORER.

The season begins with the Winter Education Conference, a multi-session offering set Feb. 14-18 in Houston.

For more information contact the AAPG education department at (918) 560-2650; by fax at (918) 560-2678; or by e-mail at educate@AAPG.org. □

READERS' FORUM

Frac-Mapping

Regarding the fine article "Microseismic Detection Emerging" (December EXPLORER): I was gratified to see that this "frac-mapping" technique has progressed and is being used by Schlumberger. Mark Puckett's insightful information and Louise Durham's reporting offered an interesting summary of contemporary work.

Even the technique's application to fracture treatment diagnostics and reservoir management is described in the article. Good job!

Research on this technique was funded and published in the early 1980s by the Gas Research Institute (GRI) of Chicago. GRI was not the research originator, but pursued the technology and brought it into the public domain. At that time, one of GRI's programs was to promote gas recovery from tight reservoirs and to pass fledging technology to the upstream industry for enhancement and development. Research testing for several frac-mapping techniques had been started; Teledyne-Geotech, of Garland, Texas, was GRI's selected contractor to investigate microseismic mapping of hydraulic fracturing. As well as its historical seismic exploration in the petroleum industry, Teledyne-Geotech had current, considerable knowledge in passive seismic monitoring and seismometer manufacturing.

Initially for the GRI project, relatively simple arrays of surface seismometers near the well being "fraced" attempted to spatially map propagating hydraulic fractures. Typically, ground-motion "noise" from frac pumping operations, etc., was a detriment in obtaining useful microseismic signals. However, later tests using down-hole arrays of three-component seismometers in adjacent wells were successful, and "real-time" mapping of the propagating fracture was proved. At that time, the practicality and expense of obtaining adjacent wells for installing down-hole seismometer arrays was viewed as too much of an obstacle for widespread use by the industry.

As others have related their recollections of 20-plus years, the forgoing

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.

may not have been exactly the way that this early research occurred, but that's the way that I remember it.

Again, it is pleasing to learn that the technique has been greatly advanced, developed and is in use by Schlumberger. Knowing a small part of the work that must have been involved, I'm impressed.

Jack S. Sanders
Dallas

Risky Business

I was pleased to see Louise Durham's article on investors (October EXPLORER), which highlighted a topic that is critical to our membership. One of the opening statements, however, was misleading: "Wall Street wants growth but hates risk."

Wall Street actually embraces risk – if that were not true, then they would be investing primarily in 30-day Treasury notes. Wall Street profits by taking risks, and by understanding risk.

What investors do not like is unpredictability and unexpected surprises, which undermine their understanding and profiting from risk. Investors must trust operators to deliver what they promise, and they must assign a chance of that happening (often using past track records). Inflated predictions of what and when a portfolio can deliver, over-hyping a one-off high-risk well, failing to warn the investment community of what constitutes a normal random string of bad luck are a few ways to erode confidence in predictability and lose investor trust.

The investment community will embrace those who successfully manage and communicate expectations in the face of risk.

Henry S. Pettingill
Houston

EMD Publications Available from AAPG

NEW! * Sequence Stratigraphy, Paleoclimate, and Tectonics of Coal-Bearing Strata (AAPG Studies 51)

Jack C. Pashin and Robert A. Gastaldo
This volume contains 10 chapters on coal-bearing strata of Carboniferous through Tertiary age and is based on a special session that was held at an AAPG Annual Meeting in New Orleans. Contributors have employed a multitude of approaches ranging from basin analysis to plant taphonomy to support a variety of views on sequence stratigraphy, paleoclimate, and tectonics of coal-bearing strata.

*** Atlas of Coal Geology** (AAPG Studies 45)

Alexander R. Papp, James C. Hower and Douglas C. Peters
This two-volume publication on CD-Rom is designed as a reference and learning resource for both the novice and the expert in academia or the energy industry. Fully searchable by key words.



*** Unconventional Energy Resources of North America** (Poster) John R. Dyni

This is an excellent summary of information about coal, coalbed methane, natural gas hydrates, oil (tar) sands, oil shale, geothermal energy, and uranium.

Anticipated readership: geologists, university geoscience departments, federal and state administrators, high school students, and the informed public.

*** Geology in Coal Resource Utilization**

Douglas C. Peters
A compilation designed to show how geology and geologic concepts can be applied to coal resource exploration, extraction, and utilization. The papers are directed at managers to demonstrate the applications – and limitations – of geology in the coal industry.

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The Boone Pickens School of Geology is a growing department that is strongly committed to the goal of excellence in research, teaching, and extension. It offers a full range of undergraduate and graduate courses that lead to B.S. and M.S. degrees in Geology. The School of Geology currently has more than 60 undergraduate students and more than 30 graduate students. The department is developing plans to enhance the graduate program.

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leadership, innovation, and a reputation as an outstanding scientist at an international level is requisite for this Endowed Chair.

Stillwater is a small, attractive university city of about 38,000, located on the prairie in north-central Oklahoma. Stillwater is 65 miles north of Oklahoma City and 60 miles west of Tulsa. Numerous cultural activities can be found within a two-hour drive of Stillwater. The Oklahoma State University campus is one of considerable beauty, with modified Georgian architecture.

Oklahoma State University encourages applications from qualified women, minorities, and persons with disabilities. Please send curriculum vita and names, addresses, e-mail addresses, and phone numbers of three references to Professor Dale Lightfoot, Chair of the School of Geology Search Committee, 225 Scott Hall, Oklahoma State University, Stillwater, OK 74078-4073. Telephone: 405-744-6250; FAX: 405-744-5620; E-mail: drlight@okstate.edu.

Informal inquiries to Dean Peter M.A. Sherwood of the College of Arts and Sciences are welcome (e-mail: peter.sherwood@okstate.edu; Telephone: 405-744-5663).

For full consideration, all applications must be received by February 1, 2005. Applications will be accepted until the position has been filled.

Oklahoma State University is an Affirmative Action/Equal Opportunity Employer. This position is subject to availability of funding.

More information on OSU and the Boone Pickens School of Geology can be found on the Web www.pio.okstate.edu and www.okstate.edu/geology.

**Department of Earth & Ocean Sciences
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**Assistant Professor
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The Department of Earth and Ocean Sciences at the University of British Columbia invites applications for a tenure-track faculty position in the area of sedimentology and/or stratigraphy. We seek a scientist whose research enhances and extends our existing strengths, particularly in areas that are process oriented and/or applied, including but not limited to, exploration and exploitation of fossil fuels, environmental studies and economic geology. This appointment is at the Assistant Professor level although applications from exceptionally well-qualified, more senior scientists will be considered,

particularly if they address under-representation of designated equity groups such as women, visible minorities, disabled persons or aboriginal people. Candidates from all relevant fields of Science and Engineering are encouraged to apply. The position will be available as early as July 1, 2005. A Ph.D. is required by the commencement date. Teaching at the undergraduate and graduate levels is expected.

The University of British Columbia hires on the basis of merit and is committed to employment equity. All qualified persons are encouraged to apply; however, Canadians and Permanent Residents of Canada will be given priority. This position is subject to final budgetary approval. For more information about the Department and this position, visit our web site at <http://www.eos.ubc.ca>.

Applicants should send their curriculum vitae and a statement of research and teaching interests, and arrange for three letters of recommendation to be sent to Dr. Paul L. Smith, Head, Department of Earth and Ocean Sciences, the University of British Columbia, 6339 Stores Road, Vancouver, British Columbia V6T 1Z4. E-mail: AppliedSed@eos.ubc.ca; Fax: 604-822-9014. The deadline for receipt of complete applications is February 14, 2005.

**CHAIR / Department of Geology
Stephen F. Austin State University**

Applications are invited for chair of the Department of Geology at Stephen F. Austin State University to begin August 2005. We seek an outstanding individual with strong management, communication and interpersonal skills to provide innovative and energetic leadership for our department. Duties include recruiting, advising, developing a strong base of alumni and industry support, teaching, and research. Applicants should have credentials for appointment at associate or full professor level. Candidates with expertise in petroleum geology and geophysics, or sedimentary petrology are preferred and will teach undergraduate and graduate courses, plus occasional weekend field trips. The department offers a master's degree and is committed to quality teaching, field geology and laboratory studies.

Applicants should send a letter of application, CV, statement of teaching and research interests, statement of leadership skills and administrative philosophy, reprints, copies of official transcripts and three letters of reference to: Search Committee, Department of Geology, P. O. Box 13011, Stephen F. Austin State University, Nacogdoches, TX 75962. Review of applications will begin immediately. EOE; security-sensitive position; criminal history checked. For additional information go to: www.geology.sfasu.edu

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continued on next page



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Commentary
from page 30

Global Circulation Models have not yet been successful in back modeling of recorded climate history through the Little Ice Age and into the Medieval Climate Optimum (to about A.D. 900). This inability to model pre-industrial revolution climate change probably is a result of not recognizing that solar and orbital variability, not human emissions, drive climate change (for instance, see Bond et al, 2001; and Zahn, 2002; also Fischer et al, 1999).

Models empirically fit to parameters in which greenhouse gases are the primary drivers of climate change and will not be successful in modeling past climates.

In an effort to counter this argument, Mann et al (1999) claimed that there was no global medieval warm period prior to the Little Ice Age – a claim now

discredited by both restudy of their database and by new studies (Esper et al 2002; Soon et al, 2003; McIntyre and McKittrick, 2004).

* * *

The ACIA report presents a projection of impacts that would result if temperature increases occur as projected by the modeled warming trend they adopted from the IPCC. The understanding of potential impacts provides some utility for planning possible response to global warming.

However, the computer models for predicting temperature increase, the amount of temperature increase and the cause for temperature increase are beyond the scope of the impact assessment and data and are still very much involved in scientific examination, testing and debate.

Arctic and Northern Hemisphere civilization has arisen in the last 10,000

years in response to natural global warming. Trying to project where further warming will change conditions provides utility but would be more useful if it more thoroughly examined impacts presented by a range of temperature change conditions – including cooling, moderate warming and even extreme warming.

For example, the study did not address the impacts of continued cooling in the Canadian Arctic sub-region if the cooling trends exhibited over the last 50 years continue.

Until the proposition that human activities and emissions control global climate is proven, and it is quantitatively demonstrated how human activity changes will affect climate (and concomitantly how those activity changes will affect humans and the globe), the assignment of cause and the prediction of the effects of mitigation efforts is questionable and may have to bear responsibility for misdirecting resources needed to deal with warming or cooling

over which we have no control. It is clear that the climate changes.

It is wise for us to evaluate how possible climate changes may affect the environment and our lives. It is potentially irresponsible to assign blame and advise specific action before we have understanding.

If governments are convinced that humans can prevent climate change simply by reducing energy use, then no effective mitigation will result. People will suffer, both in the Arctic and elsewhere, and we will have sacrificed proper planning and mitigation to the altar of humanocentric theology.

Note: Complete references are available on the AAPG Web site.

(Author's note: I appreciate the editorial review and discussion by Alan Byrnes, Kansas Geological Survey. Thomas Hanson steered me to the figure from the West Virginia Geological Survey Web site.) □

continued from previous page

sedimentology/stratigraphy, graduate courses in the hire's specialty, team-teaching undergraduate field course(s), and, on a rotational basis, a large enrollment introductory geology course. The preferred start date is August 2005.

To apply, send as email attachments a curriculum vitae, statements of research and teaching interests, and names and addresses of three referees to barbh@cnr.colostate.edu. Include "Sedimentology Application" in the subject line. Ancillary materials, such as copies of recent publications, may be mailed to: Sedimentology Search Chair, Department of Geosciences, Colorado State University, Fort Collins, CO, 80523-1482. Applications may be accepted until the position is filled, but for full consideration please submit by February 1, 2005. For a full job description and additional information, candidates can visit: <http://www.cnr.colostate.edu/geo> or contact Dr. Dennis L. Harry at dharry@cnr.colostate.edu or 970-491-2714. CSU is an EEO/AA employer.

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DIRECTOR'S CORNER

Some New Year's Resolutions

By RICK FRITZ

I "Googled" the Internet to see if I could find any interesting or humorous "New Year's Resolutions." I was surprised to find that most of the resolutions were quite serious. Most were about the human physical condition – losing weight, building muscles, even getting plastic surgery.

Many others were resolutions about money – how to make it, keep it, save it, invest it, love it. There were several about the human psyche – resolutions on becoming a better person, a better parent, a better boss.

There was even one on how to keep your New Year's resolutions:

1. Write them down on paper.
2. Develop a schedule.
3. Start now!
4. Find a role model (in case your role model is gone).
5. Record your progress.
6. Tell everyone about what you are doing (I guess so you can feel bad if you don't do it).

It sounds like a strategic plan to me.

* * *

Since everyone is so serious, I will stay in the same vein and mention a few of AAPG's New Year's resolutions.

□ Our first New Year's resolution is the same each year, and AAPG's leadership and staff take it very

Our first New Year's resolution is the same each year, and AAPG's leadership and staff take it very seriously. It is to continue to improve communications with AAPG membership.

seriously. It is to continue to improve communications with AAPG membership. In the all-member survey (February 2003 EXPLORER) you told us that AAPG was generally very responsive to your needs, but we think there is always room to improve.

The EXPLORER, of course, is one of our key communication vehicles, and each month it is packed with information.

More and more members are using AAPG's Internet homepage. Last year we counted over five million "hits" on our Web site (a hit is each page that is opened).

Both the BULLETIN and the EXPLORER are available through Internet access – and don't forget that AAPG's e-magazine, *Search and Discovery*, is available at no extra cost.

□ A second key resolution involves the BULLETIN. Last year, AAPG's Executive Committee approved the

formation of the BULLETIN Re-format ad hoc Committee, whose mission was to determine the future primary format of the BULLETIN. The committee recommended that the primary format of the BULLETIN change to digital as soon as possible, and the Executive Committee approved. Hardcopy will be the secondary format, and will remain available as members change to digital.

One of the key factors in this decision was the cost of postage – as well as printing costs. Yearly postage expense for mailing both the BULLETIN and EXPLORER costs more than \$45 per member in some areas of the globe.

□ AAPG's third resolution is overarching and includes the first two resolutions described above. It is "to build a comprehensive business plan from the recently developed strategic plan."

We appreciate your responses to AAPG's strategic plan, which was

published in the November EXPLORER. Once again, I encourage all members to read the plan and respond as soon as possible, as we are in the process of finalizing the plan for this year.

As we reach consensus on the Association's ultimate strategic destination, with some road stops, it is time to build the road map – a tactical guide that we can develop into a new, comprehensive business plan for AAPG. It will include resolutions on membership architecture and marketing, dues structure, revision or deletion of old programs and development of new, and AAPG's future global development.

AAPG's Executive Committee will convene a two-day retreat in January to develop this plan, and you will hear more about it during the year.

* * *

I usually do not make New Year's resolutions, but this year I think I may just go on one of those "seefood diets" – you know, the one where you eat everything you see. I think my psyche will be OK with that.



Activities, Funding Under Discussion

Washington Office Grabs Spotlight

By MIKE PARTY
DPA President

I want to focus this month's column on the discussion of opening a Washington, D.C. office for AAPG through the DPA's Governmental Affairs Committee.

The AAPG Executive Committee has approached the DPA to be part of this endeavor. Plans are to open the office and, after 2 1/2 years, evaluate its effectiveness regarding cost as well as what the office has achieved and can achieve.

DPA conducted a survey in mid-October to gauge the membership opinion on this endeavor. We contacted an independent firm to help structure the questions and administer the survey and compile the results. The consulting firm feels that we obtained a statistically valid sampling of our membership. This information was then used to help shape the direction the DPA would take on this issue at our mid-year meeting held the first weekend in November of last year.

The survey results, coupled with the survey that was conducted earlier by the AAPG, led the AAPG and DPA leadership to conclude that our members have an interest in being more involved in the governmental affairs area. Survey results are posted on the DPA Web site.

At the mid-year meeting, the DPA leadership raised several questions

This office is predicted to cost approximately \$500,000 over this 2 1/2-year trial period, with the DPA contributing \$125,000 of the total.

concerning the opening of this office. A "blue ribbon" committee was formed to fully evaluate the practicality of the office as well as the financial aspects. This office is predicted to cost approximately \$500,000 over this 2 1/2-year trial period, with the DPA contributing \$125,000 of the total. This will expend about 20 percent of DPA cash reserves. Therefore it is the burden of the leadership to make certain this issue is thoroughly thought through and all aspects are considered.

The blue ribbon committee will address several major concerns, one of which is funding for the office. It is believed at this juncture that monies can be secured through grants as well as other avenues within the government. The committee will be looking into how readily these grants can be secured for AAPG and at what dollar amounts. Private donations from individuals and corporations also could be solicited to help fund the office. These donations are expected

to be a source for approximately 25 percent of the cost.

* * *

The next big question is, "Can we make an impact in Washington, D.C. with this office?" The committee will be examining how business is conducted in our nation's capital, and how our Washington contact can be a player.

Several people on the committee have been involved within the Beltway and can bring some valuable knowledge to the discussion.

* * *

One additional aspect to be addressed is how the activity of the office will be conducted.

It is not the intent of this office to be a lobbying arm for AAPG. The purpose of the office will be to facilitate the AAPG in getting Position Papers before governmental agencies as they deliberate issues that will



affect the membership of AAPG. We will present factual data that can be used to help shape policies.

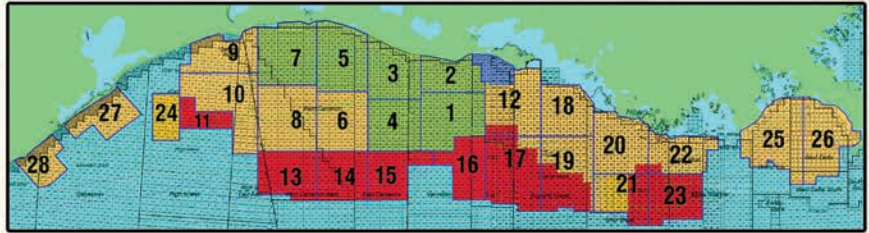
All of these issues and more will be considered prior to a final vote within the DPA. The blue ribbon committee must determine that the office has a very high chance of success in helping AAPG members as well as obtaining funding.

The DPA will vote on this proposal in January, possibly before you have a chance to read this article. I assure you that all of the officers and the Advisory Council members understand our responsibility to you, the member.

Whatever the outcome of this issue is from the DPA, please be reassured that it was considered thoroughly, and that a great deal of effort went into gathering data so that an informed decision could be made. □

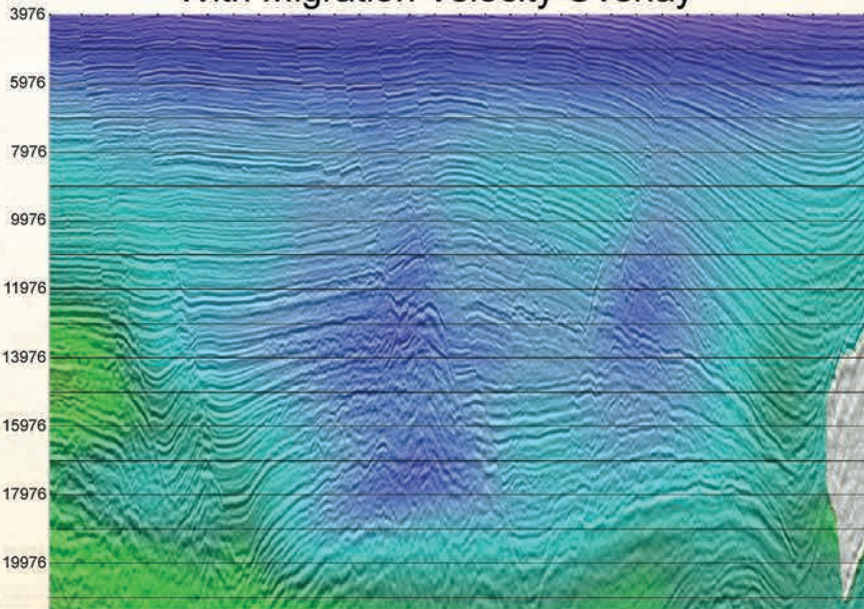
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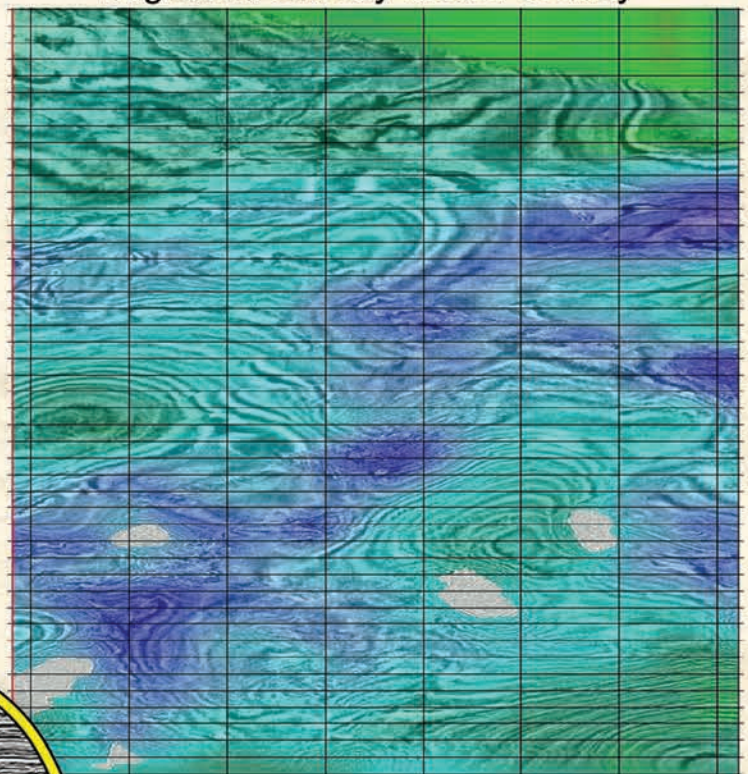
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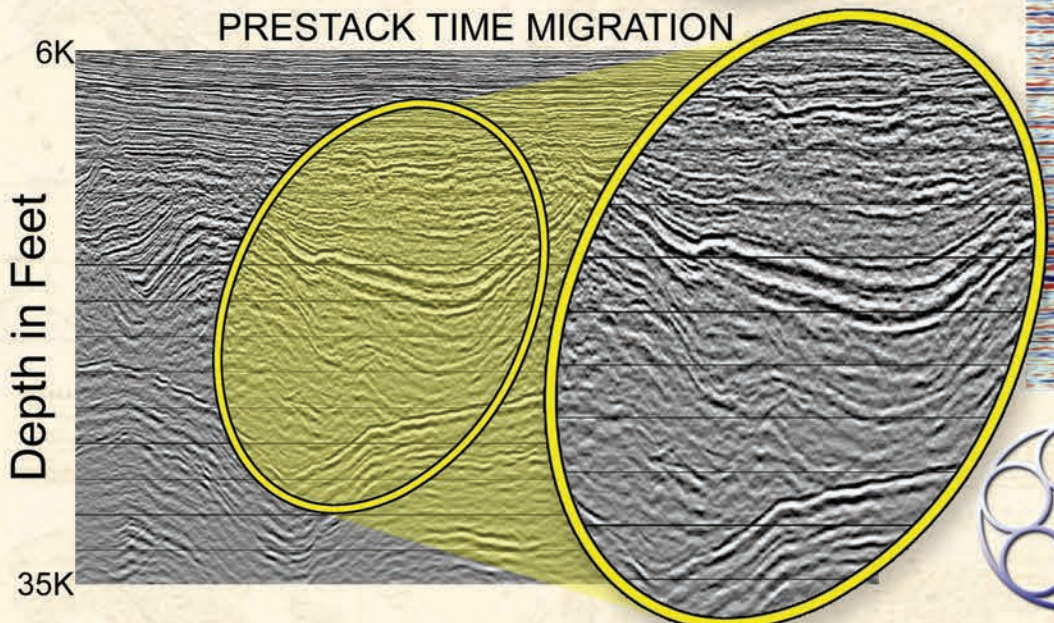
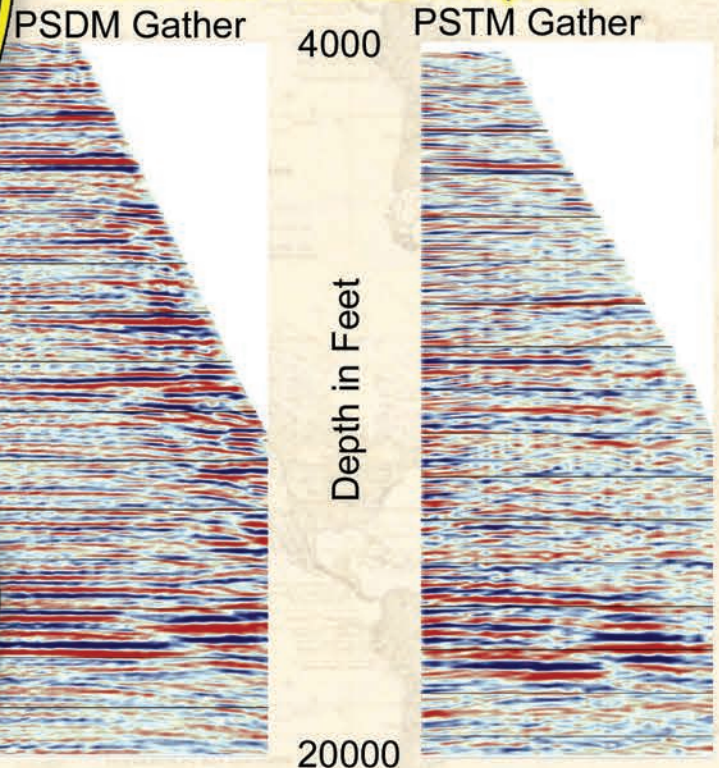
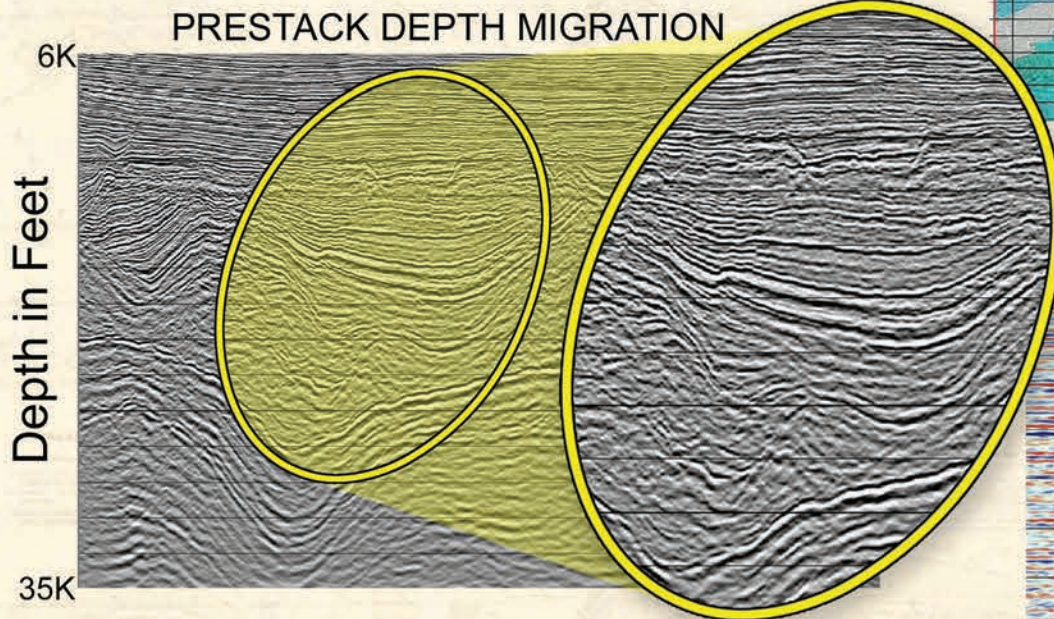
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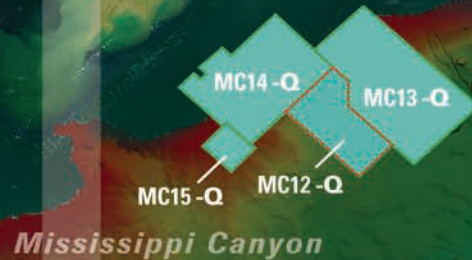
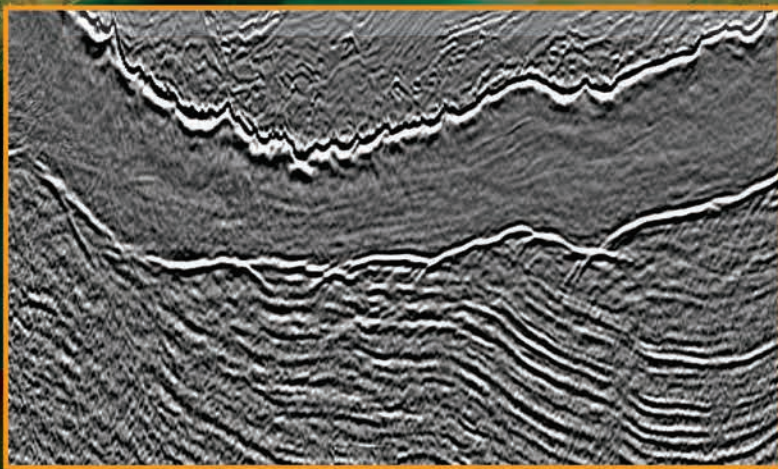
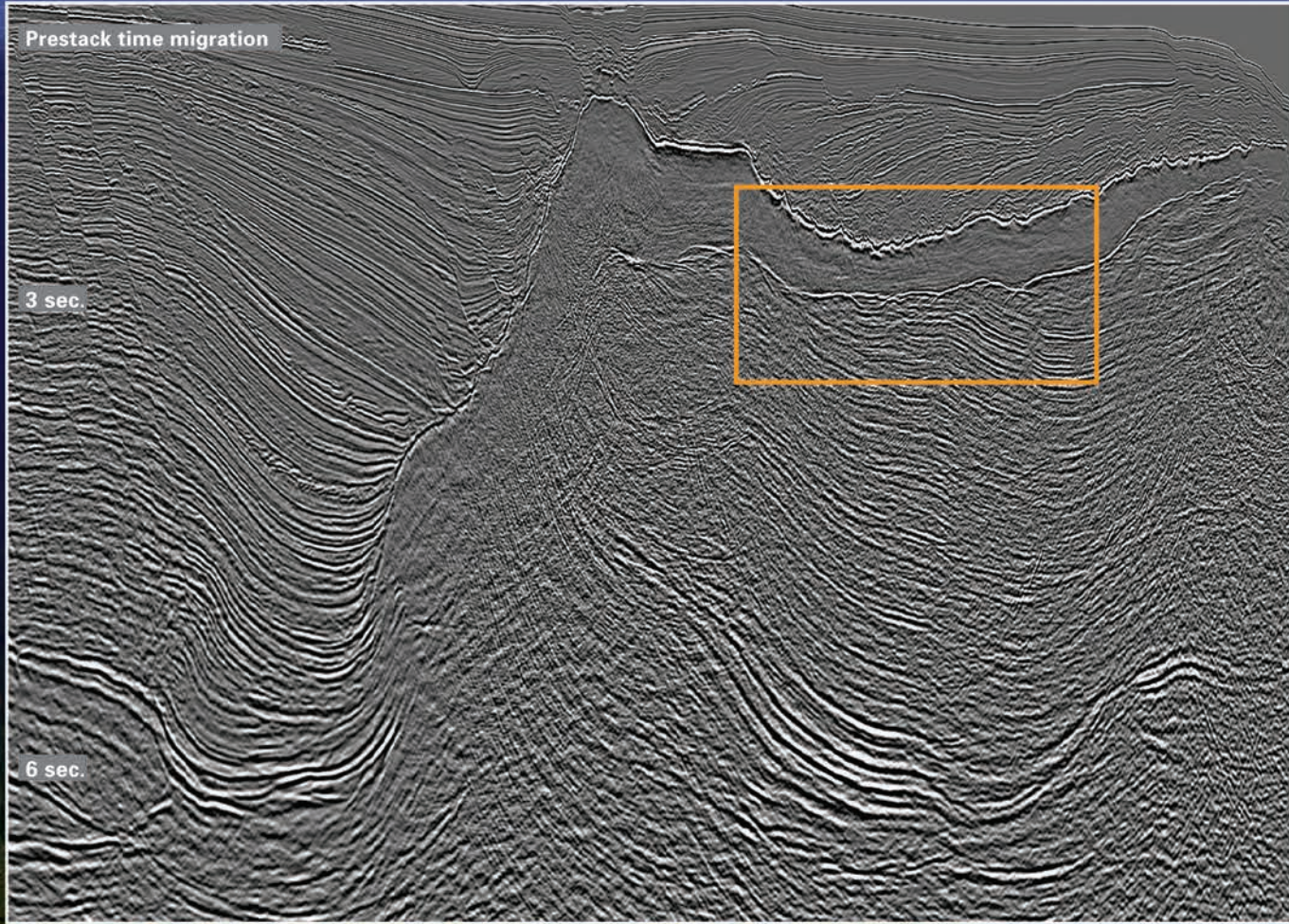


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