

AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

EXPLORER

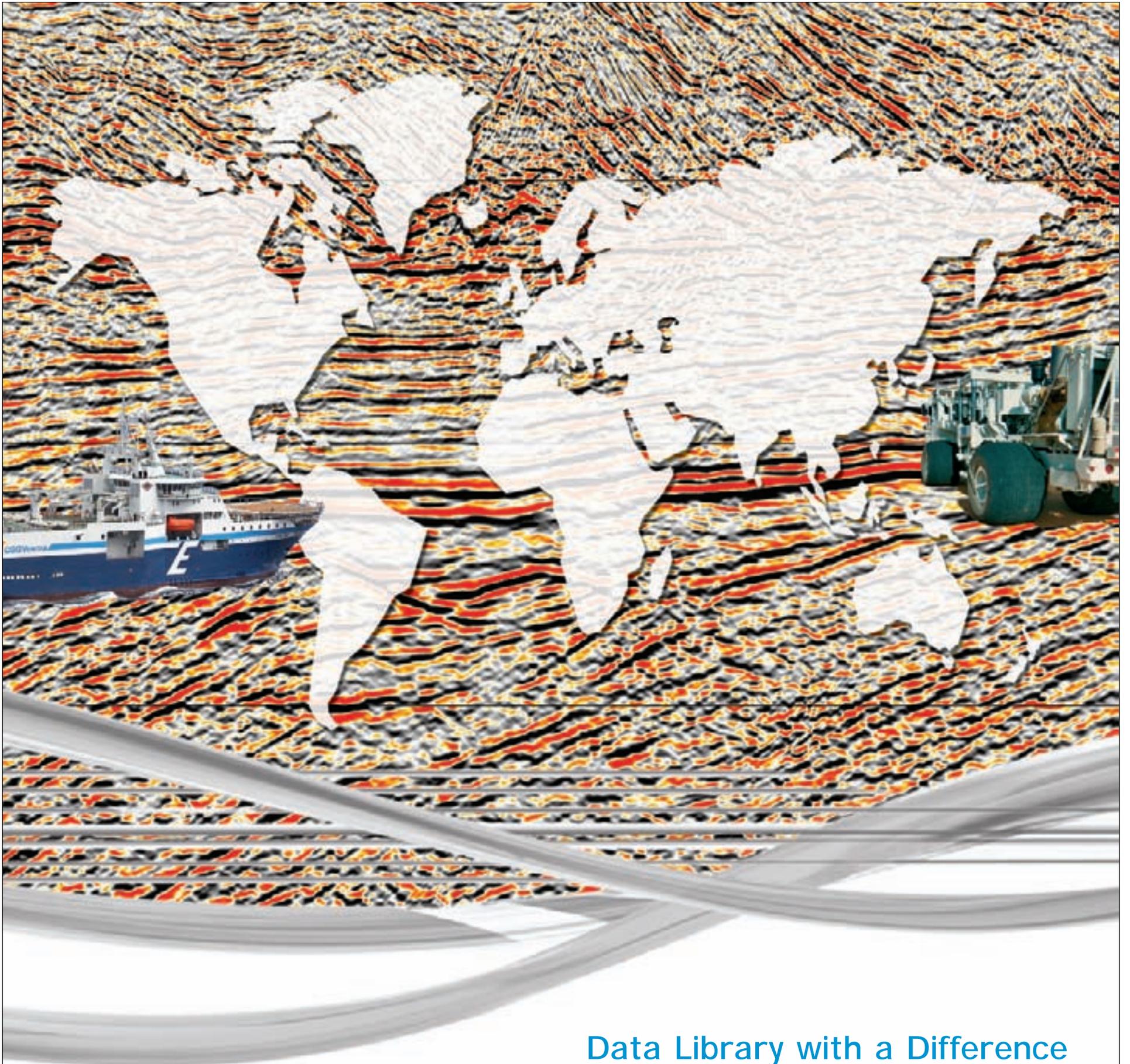
JANUARY 2008

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See page 18





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On the cover: Outstanding exposures in Nova Scotia of the Late Triassic Blomidon formation revealing numerous first, second and third order surfaces – an outcrop that is important when it comes to better understanding Atlantic conjugate margins, and a site that will be visited during an upcoming conference in Halifax. See story on page 18 – one of several stories in this issue that offer a look at exploration activities around the world. Photo courtesy of Gela Crane.

CONTENTS

- The medium is *still* the message: Effectively communicating the industry's "message" has required companies to rethink – and repackage – their **public image**. **6**
- A year to remember: Here's a look at the important discoveries that made **global "hit" parade** in 2007. **10**
- The best of the best: Petrobras and partners scored big headlines and a potentially exciting future last year with the big discovery at the **Tupi Field**. **14**
- Nova Scotia and Morocco – separated by an ocean, but joined by common geologic past – are the focus of an important conference on **conjugate margins**. **18**
- The reel thing: Filmmakers with a love of **geology** and connections to the oil industry are helping to show that the earth has **star quality**. **26**
- This is not your father's old career: The number of **women geoscientists** – and their impact – continues to grow and transform the industry in the 21st century. **32**
- A curve in the road: Everyone knows about King Hubbert's controversial "**Hubbert's Curve**," but what do you know about the man? **36**
- Angola** is rising to the top of the list of Africa's hot spots, as demonstrated by the buzz surrounding a recent AAPG-endorsed conference. **40**

REGULAR departments

Washington Watch	30	Membership and Certification	49
Geophysical Corner	34	Readers' Forum	52
Professional News Briefs	35	In Memory	52
www.update	44	Classified Ads	53
Regions and Sections	46	Director's Corner	54
Foundation Update	48	DPA Column	54

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We are the champions: The members of the University of Aberdeen's Imperial Barrel Award team, winners of the top prize in 2007. This year's competition will be held during the AAPG Annual Convention in San Antonio.



PRESIDENT'S column

Students Embracing 'Barrel' Challenges

(Editor's note: AAPG President Will Green has asked Randi Martinsen, AAPG treasurer, to comment on the Imperial Barrel Award competition.)

By RANDI MARTINSEN
AAPG Treasurer

We want in!

That was the opening statement of the University of Wyoming's Imperial Barrel Award (IBA) Competition Team – my team – at last year's event in Long Beach, Calif.

The team over the previous weeks had:

- ✓ Studied their basin (onshore Australia).

- ✓ Worked what they could of the data.
- ✓ Become hooked on the potential of the area.

- ✓ Developed some exploration strategies.

- ✓ Were now ready to convince "management" (the judges) on why this basin was so economically prospective.

The team members were nervous but confident their analysis of the basin was accurate, and their excitement and enthusiasm were palpable.

It was not always so.

* * *

The IBA, a competition concept developed by Imperial College (London) in 1976 as part of its MSc petroleum geoscience program, is a competitive, exploration-based project that requires teams of four to five students to:

- ✓ Demonstrate evidence of rigorous and creative technical evaluations.

- ✓ Work to a strict deadline.

- ✓ Work effectively as a team.

- ✓ Make decisions based on limited data.

- ✓ Give lucid, 25-minute oral presentations to a panel of senior industry experts.

Last year AAPG took the competition global and opened it up to universities worldwide with graduate level geoscience programs. Seven schools – the University of Aberdeen (Scotland); Imperial College;



Martinsen

the University of Oklahoma; Gubkin Russian State University (Moscow); the University of Houston; California State University (Long Beach); and the University of Wyoming – took on the challenge of participating in the inaugural global

competition.

When Steve Veal (AAPG's European Office director and the force behind AAPG taking the Barrel Award global) first mentioned it and asked if the University of Wyoming would want to participate, I told him "absolutely."

Then I had to follow through and put together a team.

I was concerned that a short time fuse, a high level of uncertainty about exactly what this "competition" consisted of and student schedules that already were full with classes, research and teaching responsibilities would make selling the concept to my students a bit difficult. I knew however, it was an awesome opportunity.

In order to pique their interest I used a strategy that is nearly always effective in luring students to meetings – free pizza. Out of the 20-plus students who attended the organizational meeting, five committed to forming a team: Cat, Beth, Jen, Liz and Phil (who the team jokingly referred to as

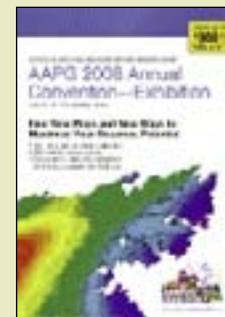
See **President**, next page

It's San Antonio Time!

Now, it's official – you can start preparing for San Antonio.

The official announcement for this year's AAPG Annual Convention, set April 20-23 at San Antonio's Henry D. Gonzalez Convention Center, is included as a supplement to this issue of the EXPLORER.

In it you'll find all of the information you'll need to plan for the



meeting: the registration details, the hotels, the short courses and field trips, the complete technical program and all of the extra activities that will make this meeting something special.

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

And don't forget, the information also is available online at www.aapg.org. □

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President

from previous page

our "token male"). For all of them, this was their first exposure to exploration.

For three, including our lone geophysicist, it was their first exposure to petroleum geoscience.

* * *

The competition was slated for March 29 – the Friday before the AAPG Annual Convention in Long Beach. Our team received our data set and instructions Jan. 23, and was set to go (we thought).

Oops, need to learn some petroleum geology fast.

Oops, our geophysical software license expired.

I believe the IBA has the potential to be one of AAPG's strongest student programs.

Double oops, the faculty contact for the software company is on sabbatical.

Triple oops, that faculty member does not want his students taking time away from their research for this project (our lone geophysicist is working "on the sly").

When the geophysical software issues were finally resolved (about three weeks before the competition), the students still had to learn the software before they could begin analyzing the data.

At times the logistical hurdles seemed impossible. The learning curves were steep; the camaraderie among team members grew strong. Although they had started out a bit overwhelmed, nervous

about expectations, fuzzy on outcome and frustrated with software difficulties, with each passing week they got more and more "into the game." They went on the offensive analyzing what data they could, strategizing about what plays might be present, and about how they could leverage their knowledge of emerging Rocky Mountain gas play concepts in evaluating their Australian gas prone basin.

By the time of the competition they were ready – they knew their basin, they utilized what data they had, they had play concepts, they saw potential, they "wanted in."

* * *

I believe the IBA has the potential to be one of AAPG's strongest student programs. I don't know all the difficulties other teams had in completing their projects, but I'm sure they were many and varied.

The Gubkin University team (from Moscow, Russia), for example, had to present in English – not an easy task for them. The Long Beach team consisted of undergraduates.

Each team pulled together, however, and overall gave very professional presentations. The sense of pride and accomplishment in "having met the challenge" was obvious on each of the student's faces at the completion of their presentations.

The event culminated with the announcement of the winning teams during the student reception. All the students, not just the IBA students, were intensely focused on the announcement.

First place: Aberdeen (applause, whooping and hollering).

Second place: Imperial (more applause, whooping and hollering).

Third place: University of Oklahoma – an unbelievable response. It was like a pep rally. OU must have brought in a busload all chanting "OU, OU, OU!" You would have thought they placed first, not third – and you would have thought it was football, not petroleum exploration.

The atmosphere was electric and the whooping and hollering went on for a long time.

Enough from me; here are some thoughts from my students:

✓ "I found the experience very rewarding. I came into the process not knowing much about petroleum geology and left with significantly more knowledge."

✓ "It was really cool to be in a 'real-world' kind of situation where we had to be responsible for everything on our own – making our own decisions about what was important and how to tackle problems. That gave the project a very different perspective than most group work done in school ..."

✓ "The competition allowed for great corroboration among students from all different disciplines of geology, allowing everyone's input to be an important part of the final product."

✓ "Having to stand up before 'management' and defend our findings was a very intense situation, and I think it's an invaluable practice for all of us going into the industry, as we WILL be doing this often as a part of our job."

* * *

As predicted, interest in the IBA has skyrocketed to the point that regional competitions are necessary to determine which teams will compete on the international level just prior to AAPG's Annual Convention in San Antonio.

You can help by encouraging your company to contribute money, software licenses and/or data.

You also can help by offering seminars/workshops in petroleum and/or software training to your alma mater or to a school in your area.

The IBA is a powerful magnet that will draw geoscience students to us and make them think, "we want in" to this profession – and "we want in" to AAPG.

Please give it your support. □

(Editor's note: See this month's Regions and Sections column on page 46 for more information on the Imperial Barrel Award competition.)

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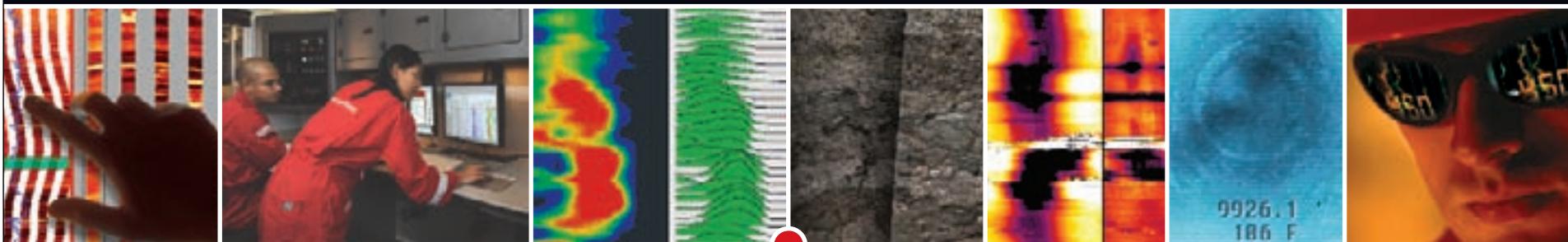
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Getting the word out

Industry Message Takes 'Flowery' Turn

By DAVID BROWN
EXPLORER Correspondent

In its prime, oil company advertising produced some classic campaigns:

Remember Dino the Sinclair dinosaur?

Remember the Texaco fire chief, Phillips 66 and Exxon?

"You can trust your car to the man who wears the star."
"Flite Fuel."

"Put a tiger in your tank!"

Now oil company ads are more likely to feature a young girl holding flowers than a furry animal holding a gas nozzle.

Indeed, we've come a long way, baby ...

Wrapped in the Web

Many of the industry's current ad campaigns can be accessed online.

For example, you'll find Chevron ads at www.chevron.com/about/advertising/.

You'll find ConocoPhillips ads at www.conocophillips.com/newsroom/advertising.

And you can find ExxonMobil ads at www.exxonmobil.com/AP-English/News/SG_Ads.asp.

In addition, several companies carry or sponsor Web sites as part of their ongoing communications programs.

Most of the industry's Web page advocacy follows an informational and educational line, in a very low-key way.

On the home page of www.willyoujoinus.com, the tagline – "To deliver the world's energy, we need yours first" – appears in the upper left-hand corner. Recently, a link to a discussion on biofuels ran below that.

Another link allowed the reader to "Play Energyville," an online game built around energy choices for a city.

Tucked away in the lower right-hand corner is the logo of the site's sponsor, Chevron.

Go to the Web page of The Energy Debate and you'll see the Shell Oil logo and a link to *The Economist* magazine online.

Visitors can register to read and post comments. A recent debate topic asked, "Can coal clean up its act?"

The bright home page of Energy Tomorrow at www.energytomorrow.com lists an energy primer called "Oil and Natural Gas 101" and a quick guide to energy issues.

Other content includes an assessment of proposed energy legislation and an Energy IQ quiz.

Scroll to the bottom of the page and you'll find the copyright notice of the site's owner, the American Petroleum Institute.

They Want to Know

Erin Thomson, API director of communications, said the public began calling in numerous questions about the industry after a series of hurricanes struck the Gulf of Mexico.

"We started stepping up our advertising right after that, because there was this huge need for information," she said.

API developed an educational advocacy campaign that includes the Energy Tomorrow Web site along with TV, radio and print advertisements.

Money for the multiyear campaign



comes from the API ad/promotion budget, according to Thomson.

Early in 2007, API introduced the new Web site features, which include a radio player for short audios.

"We've done interviews with people on such topics as energy supply, hurricane preparedness and energy legislation," she said.

"We have podcasts on there. We've had blogger events on there.

"The Energy IQ is another interesting survey we did last summer," she added. "It's a quiz you can take testing yourself about your knowledge of the industry."

In addition to offering the quiz, the site reports on earlier results – including the percentage of test-takers who answered questions correctly.

For instance, only 7 percent knew that the industry has invested \$75 billion-\$100 billion in emerging energy technologies.

If you want a cheat: The percentage of potential offshore exploration sites in the United States restricted by the U.S. government is 85 percent.

Ads in the campaign, including TV video, can be accessed at www.api.org/aboutapi/ads/.

Print ads in the campaign have run for about a year, primarily in magazines and the national press.

"We've run in publications all over the country. Inside the Beltway, we've run in the *(Washington) Post*, *National Journal*, *CQ (Congressional Quarterly)*" and also in *USA Today*, the *Wall Street Journal* and *New York Times*, she said.

We're (Gulp) No. 1?

While the API ad campaign and Web site do include statements on energy legislation, they largely focus on facts, data and information about the industry.

There's very little image-polishing or apple-polishing, although the information presented is designed to show the industry in the best possible light.

"It's more about education," Thomson noted. "When you look at our Blue Sky TV ad, you can see we're trying to let people know about this new fuel that's coming online. It's very informational."

But so far the ads have generated more public response for their flash than

their substance. Thomson said API's TV ad featuring the look, style and music of the 1970s has drawn the most interest.

Other efforts in the campaign include a traveling petroleum technology exhibit – "I would say geared toward high school and above," she said – and a speakers series.

"What we hear from people inside the industry is that they're really glad we are out there talking to people," Thomson said.



Graphic courtesy of API Web site

U.S. Sen. John McCain once remarked that the oil industry has worse PR than anybody except Satanic cults.

Sadly, that was before cults became more popular and the price of oil soared above \$90 a barrel. The Satan worshipers probably have pulled ahead.

John Carroll is a professor of mass communication at Boston University and a commentator for WGBH-TV in Boston. He said the industry faces a difficult task in improving its image.

"It's an uphill battle," Carroll said. "One of the ways advertising works is not changing people's minds overnight, but shifting people's image of the industry over time."

"Regardless of what people think of (oil companies), or what public opinion is, they can still make progress over time," he added.

Higher oil and fuel prices and increased industry profits make the job even harder, Carroll noted.

"Some people think, 'Not only are they damaging the environment, they're gouging us while they're doing it,'" he said.

Beating the Blame Game

The industry also tries to address multiple publics on multiple issues.

Advertisements and commercials sometimes have to carry out several purposes at once.

"I think they're finding themselves in situations on a number of fronts right now," Carroll observed. "But the one they are finding themselves in most now

is in global warming."

He said people look at Big Oil as a culprit in global warming, but fail to consider the role of their own activities.

"It's easier to lay the blame off on the energy companies," he said.

During the past decade, the oil industry's approach to self-promotion has changed broadly. Companies even went through some tumult as a new kind of image advertising emerged.

In 1997, Shell began an integrated approach to corporate advertising, coordinating its brand promotion on a companywide and worldwide scale.

It formed a global brand and communication team, hired a principal ad agency and produced a multinational commercial.

The former British Petroleum became BP Amoco in 1998, then simply BP two years later when it adopted the slogan Beyond Petroleum.

Unocal 76 built a long-running relationship with NASCAR as the official fuel of the racing circuit. But

newly formed ConocoPhillips dropped the sponsorship in 2003 after taking over the Unocal brand, citing a change in marketing direction.

It's Not Easy Being Green

As environmental issues emerged and provoked public concern in the 1990s, the industry shifted to greener ads. Many of them promoted efforts to protect the world's ecology.

That led to charges of "greenwashing" from industry critics, who said the ads often misrepresented or distorted the effects of petroleum development.

By 2005, oil companies faced a new challenge: growing public anger over sharply rising oil and gasoline prices.

Oil companies responded in several ways. As an initial move, top company executives became more available for

See **Industry Image**, page 8



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Industry Image

from page 6

public speeches and appearances.

CEOs started to show up on morning television programs not usually known for news content, reflecting the level of public interest in fuel cost and availability.

Industry ad strategy shifted again, with a new aim of educating the public, defending corporate profits and presenting a more earnest and gentle, girl-with-flowers image.

Promoting investments in wind power, biofuels and other alternative energy sources became very important.

Companies also began to address the global warming/greenhouse gas issue.

BP included a "How big is your carbon footprint" calculator and its carbon footprint TV ad on its Web site.

**Accentuate the Positive**

One surprising result of the new approach has seen the industry produce entertainment-quality videos – centered on individuals – that are much longer than the usual 30-second or 60-second TV spots.

Shell featured one of its engineers developing new drilling technology in a nine-minute, 14-second film titled "Eureka."

The entire video plus related resources and commentary can be seen at www.shell.com/realenergy.

Part company promotion and part

short biopic, the film also served as the basis of standalone TV commercials for Shell. The company even distributed a full-length version on DVD with several popular magazines.

Last year, Chevron debuted a 2.5-minute commercial built around its current campaign theme, "The Power of Human Energy."

Chevron took the unusual step of buying out blocks of airtime to show the ad in its entirety. The video commercial can be seen at www.chevron.com/about/advertising/.

In part, the commercial deals with the world's continued need for oil and the industry's ability to keep supplying that oil.

"This is Chevron's challenge each day, because for today and tomorrow and the foreseeable future, lives demand oil," it says, "but what's also true is that we can

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provide it more intelligently, more efficiently, more respectfully."

"This is a giant diversion machine that Chevron has produced here," Carroll said of the commercial. "These ads are long-term, incremental.

"They don't change public images of companies immediately. What they do is slowly erode the negative image and replace it with a positive one," he added.

The video ends:

"Tell us it can't be done, then watch as we tap the greatest source of energy in the world: Ourselves.

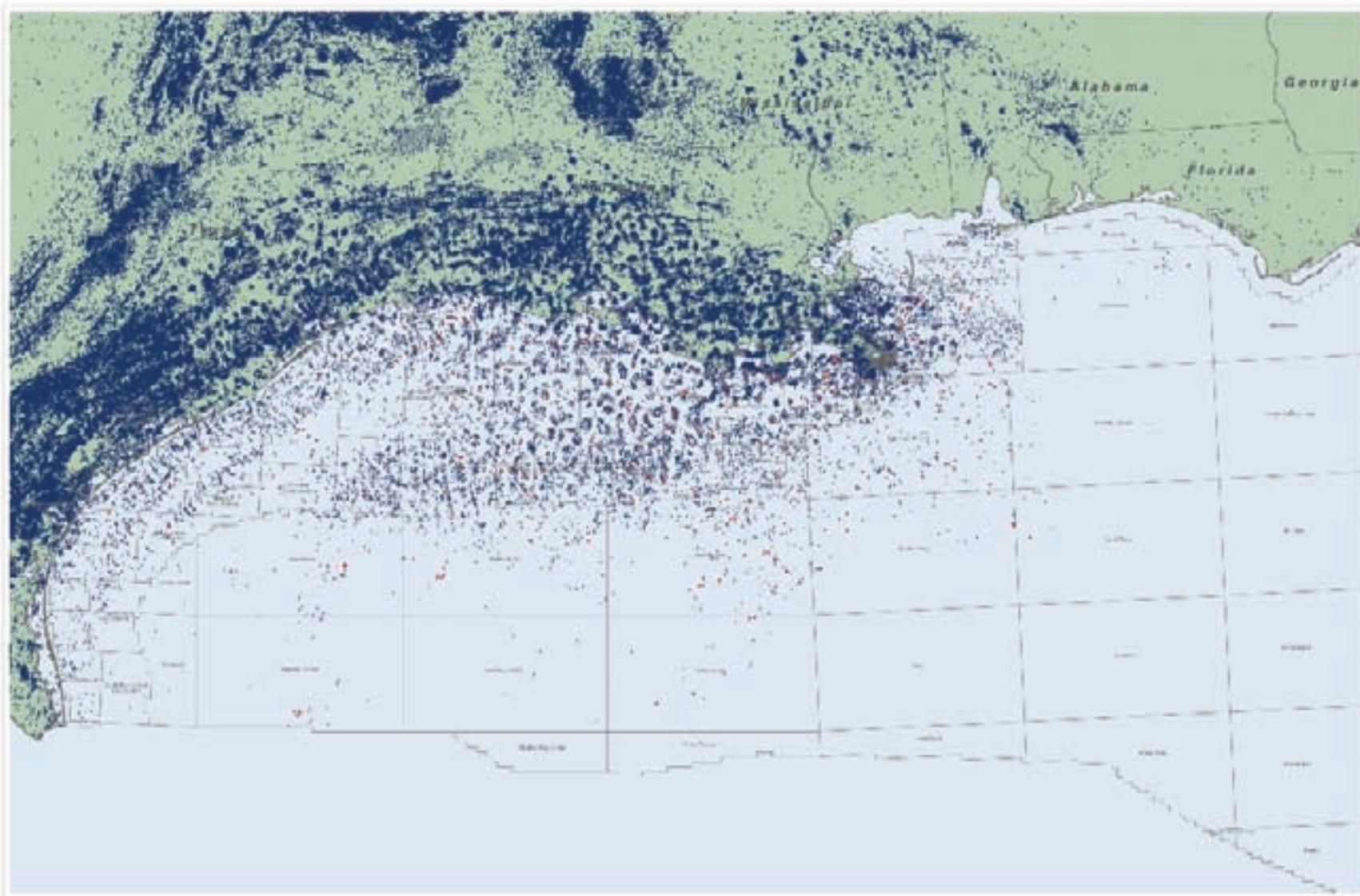
"This is the power of human energy."

Chevron continued its "Power of Human Energy" theme in a series of six print ads. Each ad features a simple observation about energy, followed by Chevron's response.

A headline on ConocoPhillips print ads reads "Tomorrow begins today," leveraging on the company slogan, "Energy for Tomorrow." The ads promote the company's involvement in biofuels research and development of alternate energy.

Typical copy: "We're improving environmental performance and stretching traditional fuel supplies by using energy more efficiently. So we can pass on what matters ... to the ones who matter most."

One ad in the series features a vertical, half-page photo of a young girl – with a container of flowers. □



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Deep find offshore Brazil leads list

Important Discoveries Hit in '07

By LARRY NATION

AAPG Communications Director

2007 was a good year for discoveries, according to Ken White, senior editor of The IHS Energy International Oil Letter, with the Tupi 1 discovery by Petrobras being a world-class discovery that will be talked about for decades (see page 14).

Additionally, Africa continued to contribute to the list of important discoveries this past year, with an offshore Angola wildcat addition to the country's portfolio of big producers.

And in Nicaragua a new field wildcat on the Oklanicsa Block in the Pacific Coastal Basin is being seen as having enormous potential.

Below is a list, provided by IHS Energy, of significant discoveries of '07. An extensive country-by-country listing can be accessed on the AAPG Web site at www.aapg.org/explorer/2008/01jan/finds.cfm.



White

AUSTRALASIA

Australia – Thebe 1, a deepwater BHP-Billiton discovery, ranked as one of the largest in Australia this year. It is

located just to the north of the Scarborough gas field and could provide much needed reserves to finally get that LNG project off the ground.

Australia – Drilled by Apache, Julimar-1 is significant as it proved up an area of the North Carnarvon Basin where subsequent follow-up drilling has led to a further discovery at Brunello, with more drilling planned in the area. Two of the four gas-bearing fluvial channel sands encountered in the well flowed a combined 85 MMcf/d.

The block is surrounded by large gas discoveries, with Tryal Rocks West and John Brookes to the south and Pluto, Xena, Wheatstone and Iago to the north.

Australia – Prelude 1A was drilled in Shell's WA-371-P license and proved up the extension of Inpex's Ichthys Field into the block.

Having identified this potential, Shell put in a then-record breaking bid of 13 wells and work commitments that come to nearly US\$100 million over six years.

CIS

Azerbaijan – BP finally completed Shah Deniz SDX 4 at a cost of around US\$120 million, one of the most expensive wells ever drilled in the Caspian Sea. It tested over 35 MMcf/d, and more than 2,300 b/d of condensate and discovered a new gas reservoir in the Pereryva suite.



Turkmenistan – North Nayip 1, drilled by Turkmengeologiya, is an important new pool discovery. Located north of the Nayip field which has three Lower Cretaceous clastic reservoirs, this new find has been successful in its objective Upper Jurassic carbonate play.

Testing is thought to be incomplete but results to date have produced 0.3 MMcf/d from the Oxfordian-Kimmeridgian between 2,255-2,317m.

Turkmenistan – Yagtylyk 1 is showing some promise as an important well. To date five open hole tests have been run, of which the Hauterivian between 2,773-2,815m flowed 230,000 cf/d.

The well has yet to reach planned total depth of 3,800 meters, and the best potential is thought to be in Upper Jurassic carbonates, as evidenced in the recent finds at Yuloten Gunorta and Osman.

FAR EAST

China – Xin 2 and 3 provided further evidence that in the Sichuan Basin there

is huge gas potential in the deep Xujiache Formation, the evaluation of which only began in 2000.

Xin 2 penetrated a 150-meter gas column in the Xujiache 2 formation and tested 18 MMcf/d, while Xin 3 flowed 8.2 MMcf/d. Such is the potential of the area, Sinopec-Sichuan plans to drill five exploratory wells and eight outpost wells to further explore gas in the Deyan area of the west Sichuan basin during 2008.

China – Dabei 3 is considered significant, as the structure is located 20 kilometers east of the Dabei 1 Field, adding some certainty to the huge gas potential in the Kuche area. The Dabei 3 is drilling ahead in the Cretaceous.

The Dabei 1 Field was discovered in 1998, but it was not until 2006 that the company drilled the first outpost around three kilometers to the southeast of Dabei 1; this well also struck gas and condensate.

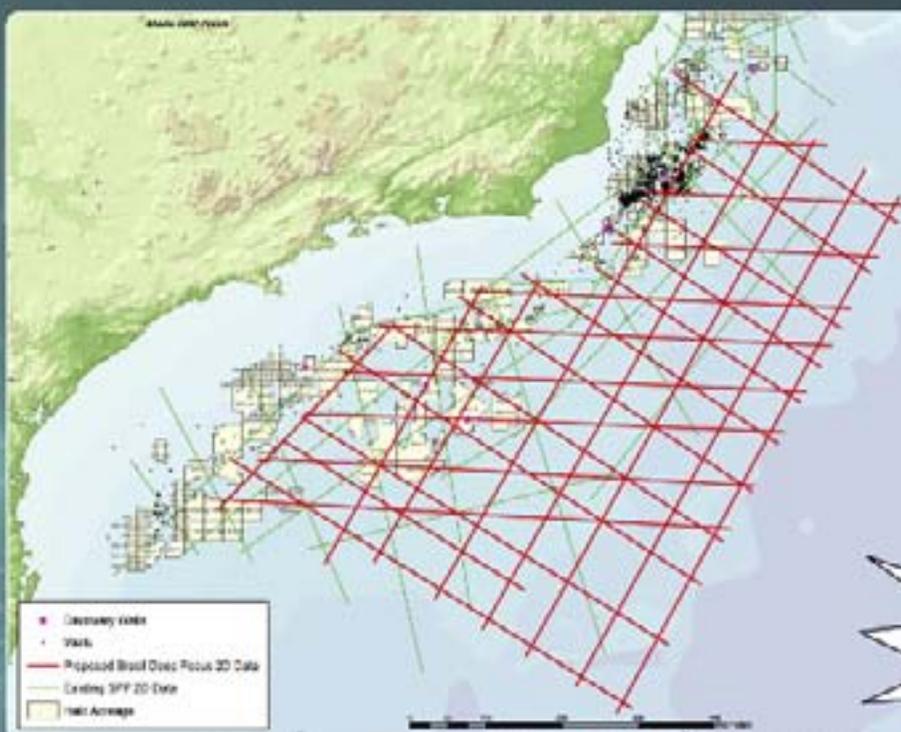
The reservoirs of the Dabei Field are Tertiary and Cretaceous sandstones, buried at depths of 5,700-5,800 meters, with porosities ranging from 4 to 9 percent. It is estimated to hold 3.5 Tcf of proven in-place gas and 5.3 Tcf of probable reserves.

The field is undergoing further appraisal.

India – The CY-III-D5-A1 (Dhirubhai 35) well, drilled by Reliance Industries, is

See [Global Activity](#), page 12

When it's a question of Brasil seismic...



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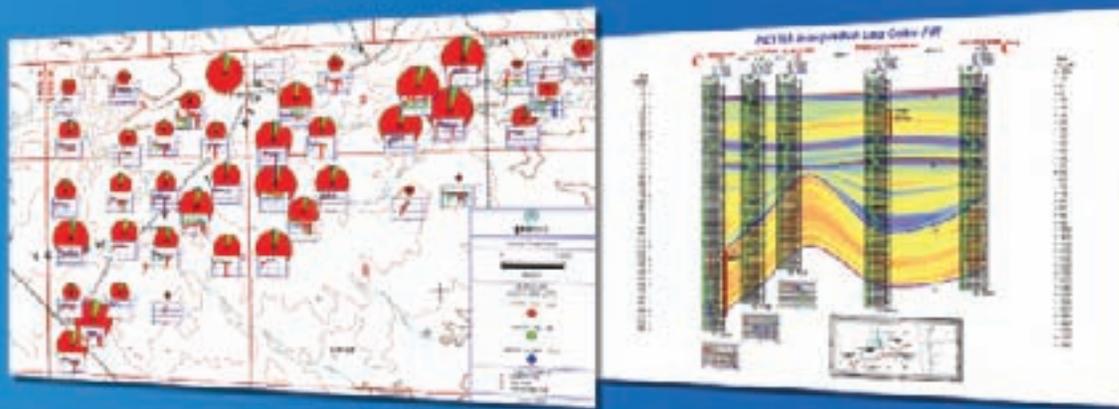
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Global Activity

from page 10

ranked as the most significant discovery in India – one of nine finds the company made during 2007.

This well is singled out because it is the first deepwater discovery in the Cauvery Basin. It encountered a clastic reservoir with a gross hydrocarbon column of around 150 meters in the Cretaceous. It yielded 31 MMcf/d and 1,200 bc/d from the main zone while a deeper second horizon tested around 550 bo/d and 1 MMcf/d.

LATIN AMERICA

Brazil – The Tupi 1 well drilled by

Petrobras is ranked as the biggest find of the year (see page 14), establishing a new carbonate facies previously unknown in Brazil. The 3-RJS-646 (3-BRSA-496-RJS) well in the Santos Basin found 28-degree API oil, with gas-oil-ratio estimated at 15-20 percent in a structure believed to hold five to eight billion barrels of oil equivalent.

Based on the 15 wells drilled to date in the subsalt trend, eight of which have been tested, Petrobras believes the productive trend extends from the Espirito Santo Basin to the southern end of the Campos Basin.

Speculation is the entire pre-salt trend could hold up to 56 Bboe reserves of light oil.

Chile – Palenque 1 is gaining in importance now that the first appraisal has been successful. It is the first

discovery in the country for 15 years and is potentially opening up a shallow gas play trend in the Magallanes Basin.

Located in the Dorado Riquelme Block, the well tested gas at a rate of 2.8 MMcf/d from three different reservoirs in the interval 800 to 1,000 meters in the El Salto Formation. It is located 8.5 kilometers northwest of Puerto Sara 1 – a 1984 one-well gas discovery that was never developed by ENAP.

Nicaragua – Norwood Resources completed the San Bartolo Rodriguez Cano 1 new field wildcat on the Oklanicsa Block in the Pacific Coastal Basin as a potential oil producer. Drillstem tests were run on 11 intervals totaling a net 179 meters, of which seven recovered oil; all but one of these is considered productive.

The six intervals have an estimated production ranging from 10 to 100 bo/d with a total combined production estimated at 205 b/d of 34- to 43-degree API crude.

The well is considered as having the potential to open a new play in the Pacific.

Peru – With pre-drill reserves estimated at 120 MMbo, Petro-Tech's San Pedro Este 1-X well located in the southern part of offshore Block Z-2B in the Sechura Basin is now looking to be more significant than originally thought. Sited in just 30 meters of water, the well reached a total depth of 2,152 meters seeking a Paleozoic primary objective.

It flowed at a maximum rate of 4.9 MMcf/d with a psi of 2,300 on a 20/64-inch choke.

MIDDLE EAST

Iran – The Minister of Petroleum claims the NIOC Sefid Zakhur 1 wildcat in southern Iran is a giant discovery. Reserves of 11.4 Tcf were mentioned, with around 8.5 Tcf recoverable.

SAHARAN AFRICA

Egypt – The Ramadan North 1 wildcat in the Egyptian Gulf of Suez, in which ONGC has equity, is a significant oil and gas discovery.

The well established 40 meters of net pay in the Asl formation and tested 2,979 b/d of 36.50 API oil and 1.5 MMcf/d.

SUB-SAHARAN AFRICA

Angola – Chevron's Malange 1 well in Block 14 offshore Angola is a significant find, with a 65-meter net oil column in the Cretaceous Pinda formation.

The first Pinda discovery on the acreage, it tested 7,669 bo/d.

Equatorial Guinea – Wildcat I-1, the first well to be drilled on Block I (in which Noble is the technical operator), was an instant success in that it confirmed the potential of the Douala Basin.

Two successful appraisals followed, the last of which (I-3) tested 36 MMcf/d and 371 bc/d and may have been drilled on the same structure as Yoyo 1 in Cameroon.

Ghana – Kosmos/Anadarko claim a significant find in the deep waters off Ghana. The Mahogany 1 well encountered a 270-meter hydrocarbon column.

To be tested at a later date, reserves are estimated as high as 600 MMb.

Tanzania – Completed in January 2007, Mkuranga 1 (operated by Mayrel and Prom) was the first well to establish potentially commercial gas flows of 19.2 MMcf/d from the Upper Cretaceous. It is located just five kilometers from the gas pipeline to Dar es Salaam and is to be appraised in 2008.

Uganda – Kingfisher 1 flowed 4,120 bo/d (30-degree API) from Lower Pliocene sands in the last quarter of 2006. However, the discovery of the main 44-meter net reservoir in the Upper Miocene was made by the Kingfisher 1A sidetracks in the first quarter of 2007 (aggregate of three tests: 9,773 bo/d). □

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Midland Valley Structure World

Welcome to the first of our structure news columns, an opportunity for us to tell you about what's new and cool in the world of structural geology. We'll be talking about case histories; showing you some nice outcrop analogues, giving you some easy tips for interpreters; a few conversation pieces for the structural gurus as well as keeping you bang up-to-date on what Midland Valley is doing.



Interpreter Tips:

1) Fault shapes - The "Chevron" method.

Even with good seismic data interpreters often struggle to draw realistic fault profiles, leading to an over or underestimation of reservoir in the footwall of faults. Getting this right is the first step towards making a valid fault framework for the map, 3D model or input to a geo-cellular model.

A time section vertical shear will give you a quick first order guide and will help you pick indistinct foot-hanging-wall cut off events with more confidence.



There'll be something for everyone - not just for clients and specialists. So, why the change from the classic advert format? We thought you'd like to hear more, and secondly we've got some interesting stories to tell you. 2008 also marks Midland Valley's 25th anniversary so the idea of a structural news column seems a great idea.

25 years is a long time for a small company, particularly in our business and we've seen a lot of changes in the industry as well as in its technology. We're proud to have been a part of it, sharing good times and bad with our clients. We've tried to stay completely focused on our discipline and on pushing the technology forwards in a way which gives value to the community.

- Alan Gibbs, Director



Silver Anniversary Events

To help celebrate our anniversary this year we'll be bringing you news on our support for universities and young professionals with:

- The Midland Valley Student Structure Prize
- Our new initiative to develop and support student training in field mapping skills
- News from our academic users and research sponsorships

Product News

For our clients we are holding a **Silver Anniversary User Conference** in October - watch out for details.

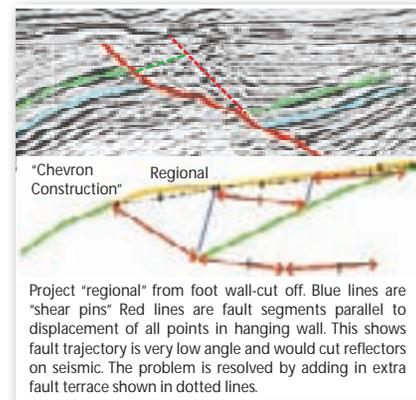
More info? E-mail Sarah events@mve.com

We'll also be giving you news of new software and services this year. Look out in this column and at the AAPG conventions for the: **Silver Anniversary Enterprise Edition software releases.**

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



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Planar faults don't produce rotation between the footwall and hanging wall. If you see rotation this usually means the fault is not planar in cross-section.

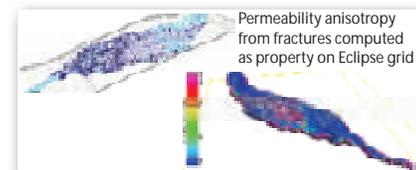
Note that fault drag of a horizon is usually at a scale of meters to a few tens of meters, not at the scale of 100's of meters.

If the hanging wall dips consistently away from the fault over the scale of 100's to 1000's meters, you should seriously think about out-of-plane displacements, ie strike or oblique slip.

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

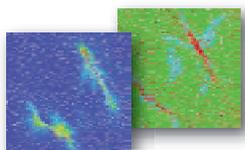
Case History - La Conception Field, Venezuela

Data Provided Courtesy of PECOM, SA
A 4D kinematic model of the field was built in 3D Move enabling volume and surface cumulative dilatational strains to be computed. These showed a strong positive correlation with seismic coherency. Using this correlation and the principal strain orientations we could then model fracture orientations and sets based on deformation history. This allowed us to build a DFN model and upscale fracture related permeability modifiers into an Eclipse grid for reservoir simulation



4D Restore

Our new geomechanical restoration tool now allows us to restore soft linked faults without additional user editing. Residual energy plots give models for fault damage zones and 3D strain trajectories. We are developing new workflows to use this new tool in fault and fracture analysis.



EXPLORER graphic by Rusty Johnson

Tupi: Find of the year

Salt Couldn't Hide Elephant From Explorers

By LOUISE S. DURHAM
EXPLORER Correspondent

You hear it all the time, both within and outside the industry.

All the Big Ones have been found.

There are no more "elephants."

News from Brazil's state-owned Petrobras could put the quietest on this kind of talk.

The company recently announced it tested a second well drilled in Block BM-S-11 at its Tuipi Field offshore southeastern Brazil in the Santos Basin that indicated reserves of as much as eight billion barrels of oil equivalent for the field. Petrobras' partners in the field include Britain's BG Group and Portugal's Galp Energy.

Energy and industry experts hailed the discovery as the find of the year.

Indeed, Tuipi represents the biggest find since the 13 billion-barrel Kashagan Field in Kazakhstan was discovered in 2000. Kashagan, in turn, was the largest field discovery since Prudhoe Bay in Alaska more than 30 years ago.

The initial discovery well in Block BM-S-11 was drilled in 2006, and a well already has been drilled in each of two neighboring blocks, according to Caio Carvalho, research associate at Cambridge Energy Research Associates in Brazil.

By the Numbers

The significance of Tuipi's potential impact on Brazil is best put in perspective when compared to the country's current reserves, which tally 12 billion barrels, Carvalho said.

He noted that the added reserves would make Petrobras the third largest company in volume of reserves, behind BP and ExxonMobil.

Yet Tuipi isn't necessarily good news for some industry players.

In fact, the Brazilian government quickly made it clear that it's not particularly interested in sharing with the



IOCs - an increasingly common and, some would say, disturbing trend among government bodies holding sway over sizeable reserves.

The day following the early November announcement of the enormous potential at Tuipi, the government removed 41 of the most promising blocks from its upcoming auction set for November 27. The auction was open to private companies who had invested considerable time and effort preparing for the event.

In the absence of the premium blocks, Shell and Chevron reportedly made no bids at all.

Tough Days Ahead?

Discovering the oil at Tuipi likely will prove to be the easy part.

This is a deepwater subsalt environment, which by definition is costly to drill and filled with unknowns.

Producing and developing the field will require major technology know-how, specialized equipment and deep pockets. Nerves of steel for the participants would help, too.

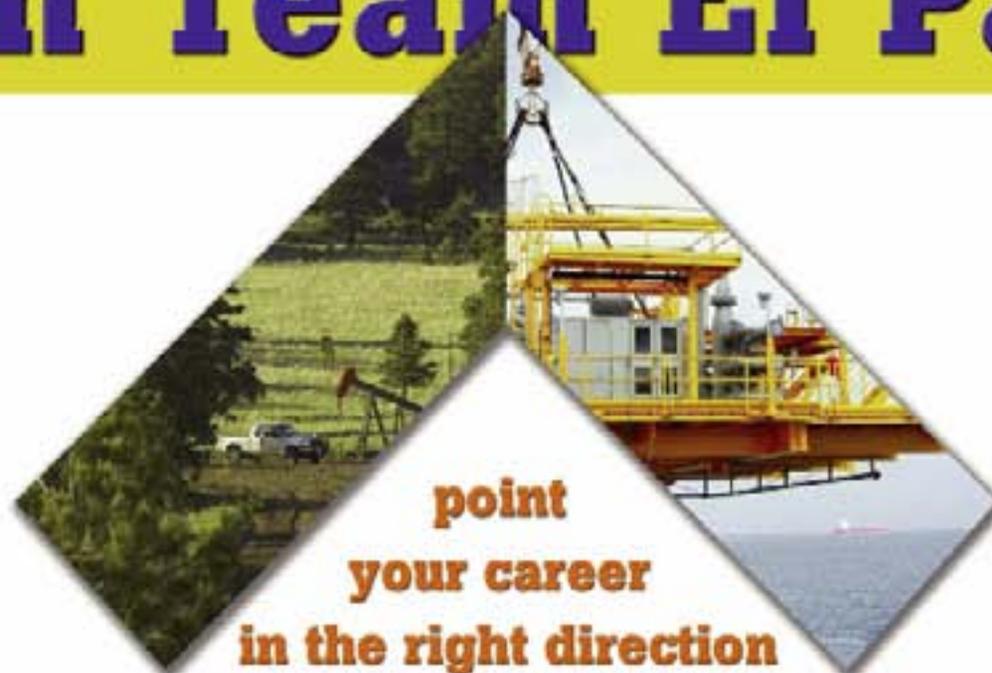
Water depth is about 7,000 feet, and the field occurs another 17,000 feet subsea under a massive sheet of salt, which is noted for its ability to hinder seismic imaging quality.

On the drilling side, extreme pressures and temperatures can pose huge problems and challenges.

Yet Petrobras is considered to be well up to the task, according to Carvalho. He noted the company historically has done most of the deepwater drilling in this

See **Tupi**, page 24

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Speculation rife

Brazil Now OPEC-Caliber Producer?

By LOUISE S. DURHAM
EXPLORER Correspondent

Oil supply cartel OPEC has once again become a household word since always-volatile oil prices began flirting with the \$100 per barrel mark.

The Vienna-headquartered Organization of Petroleum Exporting Countries comprises 13 nations whose economies rely on oil export revenues.

Achieving stable oil prices is among the group's purported missions.

The 47-year-old cartel was founded September 14, 1960, in Baghdad as a permanent inter-governmental organization, with five founding members:

OPEC's impact on oil prices has waxed and waned over the years, but its potential clout cannot be overestimated.

Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Today its membership includes the founders along with Algeria, Angola, Indonesia, Nigeria, Qatar, United Arab Emirates, Libya and Ecuador.

The OPEC statute states that "any country with a substantial net export of

crude petroleum, which has fundamentally similar interests to those of member countries may become a full member of the organization, if accepted by a majority of three-fourths of full members, including the concurring votes of all founder members."



Speculation is rife that Brazil will jump on board with OPEC at some point given state-owned Petrobras' recent announcement of a well drilled at its offshore Tupi Field (see page 14), indicating the presence of as much as eight billion barrels of oil equivalent in reserves at the field.

The cartel's member countries are accustomed to big reserves numbers.

According to available information, OPEC had proven oil reserves of 922,482 million barrels of crude at the end of 2006. This represents 77.2 percent of the world's total of 1,195,318 million barrels.

The OPEC member countries produce about 45 percent of the world's crude oil and 54 percent of the oil traded internationally.

OPEC's impact on oil prices has waxed and waned over the years, but its potential clout cannot be overestimated.

For instance, the industry remembers well the most recent price debacle in the late 1990s, when the cartel miscalculated the depth of Asia's financial crisis and, therefore, the upcoming Asian demand – and opened its spigots several turns only to watch prices crater to the \$10 range.

The cartel is known for its ability to increase or decrease oil production in response to market conditions. Meaningful spare capacity has been limited to Saudi Arabia over the past few years, but the amount of idle oil the cartel's other producers can bring on line quickly is thought to have increased.

The lack of transparency there makes a guessing game of any attempt to define real numbers.

Today, the general consensus appears to be that the group can no longer move oil prices to any significant degree, taking a back seat to such market movers as geopolitical events, increasing fund flows from Wall Street, the NYMEX traders and more. Even Saudi oil minister Ali al-Naimi is on record as saying today's price fluctuations have nothing to do with OPEC action.

Still, the mere hint of either a production increase or decrease by the cartel often sends the oil traders into a near-frenzy to bid futures prices way up or way down, depending on the situation *du jour*.

The oil and energy ministers of OPEC member countries congregate at least twice yearly to coordinate their oil production policies relative to the market fundamentals of supply and demand.

It is noteworthy that a brief November summit meeting of OPEC heads of state in Saudi Arabia revealed a tad of dysfunction may be a-brewin' within the OPEC family.

Despite OPEC kingpin Saudi Arabia's professed desire for oil price stability, Iranian president Mahmoud Ahmadinejad and Venezuela's infamous leader, Hugo Chavez, made it clear they think oil is too cheap – even at \$100 a barrel.

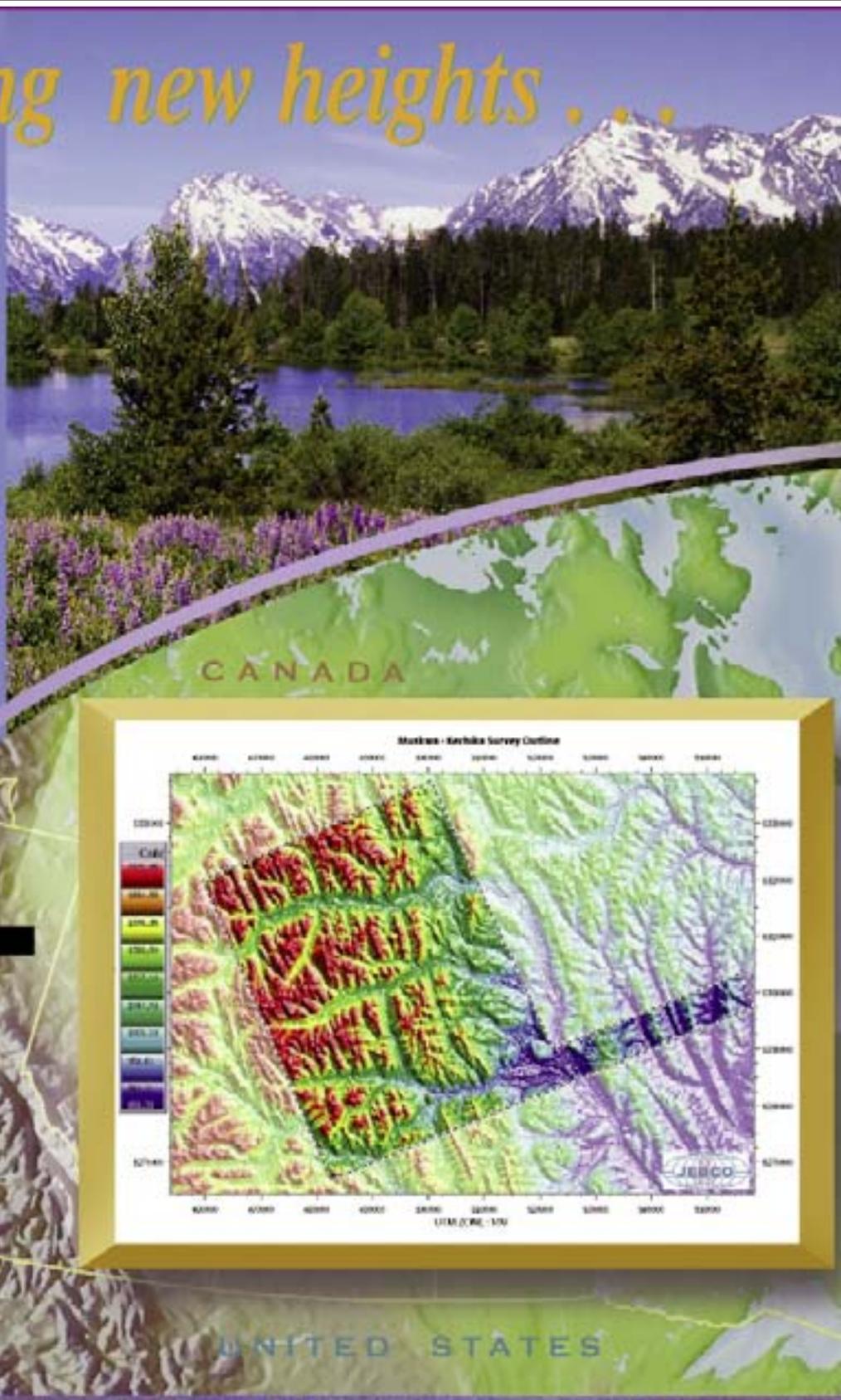
Perhaps more unsettling was Chavez's rhetoric about his desire for OPEC to revert back to a militant, revolutionary organization with the member countries using their oil as a political weapon. □

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Nova Scotia, Morocco share geologic DNA

'Analog Sisters' Prompt New Ideas

By SUSAN R. EATON
EXPLORER Correspondent

The break-up of the supercontinent Pangea and the development of conjugate margins with analogous petroleum systems on opposite sides of the Central Atlantic have resulted in many past and present linkages between Nova Scotia and Morocco.

Geologists and geophysicists in Nova Scotia cite recent oil and gas discoveries in offshore Mauritania and Morocco as analogs for their sister discoveries offshore Nova Scotia, and vice versa. In order to "touch" the Late Jurassic carbonates at EnCana Corporation's 1.0 Tcf natural gas discovery at Deep Panuke on the Scotian Shelf, geoscientists travel to Morocco, where analogous rocks outcrop.

Another historical linkage between Nova Scotia and Morocco is the French language – since the 1980s, Canadian

The call for papers for oral and poster presentations is under way for the Central Atlantic Conjugate Margins Conference, set Aug. 13-15 in Halifax, Nova Scotia.

The theme of the conference, which will be held at Dalhousie University, is "Sharing Ideas and Embracing Opportunities."

All abstracts must be submitted by March 1 through the conference Web site at www.conjugatemargins.com.

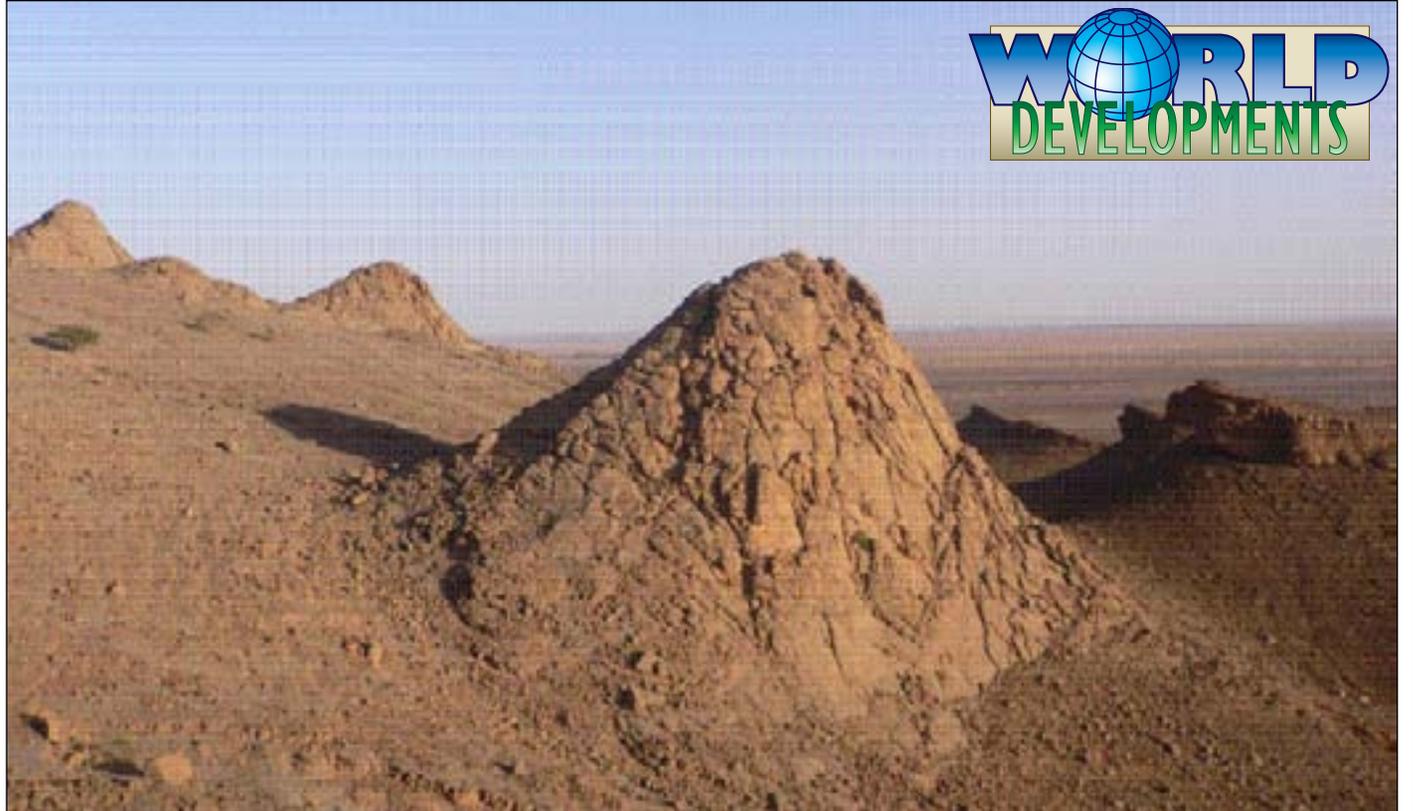


Photo courtesy of André Michardf

For Canadian Shelf explorers, this African example matters: Lower Devonian mud mounds, Eastern Anti Atlas, Erfoud, Morocco.

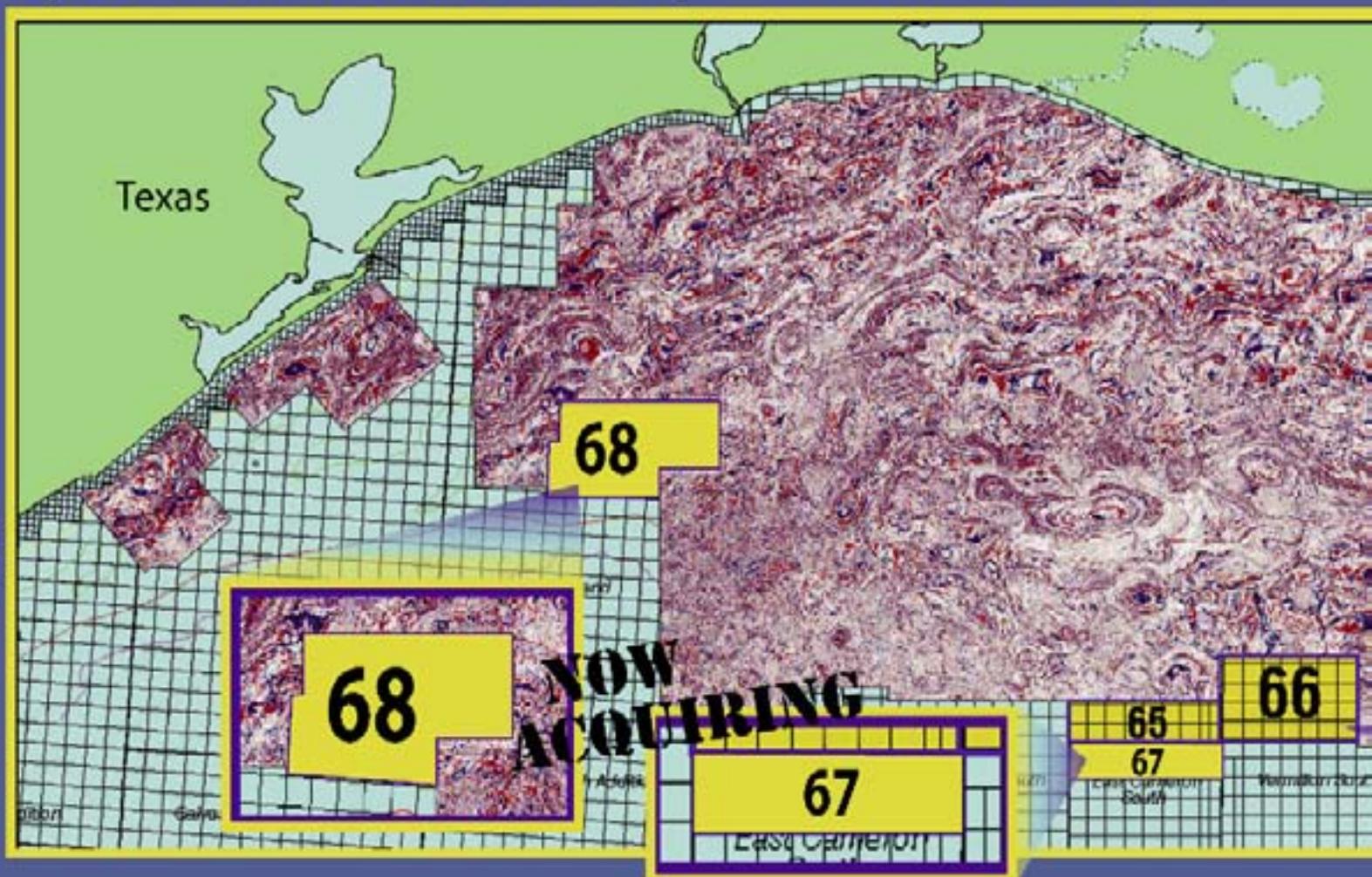
government development agencies and universities have worked with French-speaking Moroccan geoscientists, transferring oil and gas technologies and exploration and production skills.

In association with the AAPG, geoscientists from Morocco and Nova Scotia organized two conjugate margin conferences featuring a series of field trips that showcase outcrops on

opposite sides of the Central Atlantic. The first conference, held recently in Morocco, designed to create Pan-

continued on next page

By the time you read this ad, this map will be out of date.



High Island (68) & E. Cameron S. (67)
30,000' offsets,
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continued from previous page

Atlantic gatherings of geoscientists, facilitated the exchange of ideas on geological basin development and petroleum systems (see accompanying story, page 20).

The second conference, set Aug. 13-15 in Halifax, Nova Scotia, will once again provide a venue for recent advances in seismic, drilling and production technologies specific to emerging plays in these frontier regions.

Given recent discoveries and the potential expiry in 2013 of exploration moratoria on the U.S. Atlantic Outer Continental Shelf and Canada's Georges Bank, the oil and gas industry is revisiting these conjugate margins with renewed interest.

A Timely Conference

The upcoming August Central Atlantic Conjugate Margins Conference in Halifax, presented by the Canadian Association of Petroleum Geologists in association with AAPG, the Atlantic Geoscience Society and several other industry, academic and governmental sponsors, is titled "Sharing Ideas and Embracing Opportunities."

The conference, to be held at Dalhousie University, will present three basic themes:

- ✓ Margin evolution and development.
- ✓ Basin petroleum systems.
- ✓ Productive fields and analogs.

In addition to the oral and poster sessions, organizers are creating a state-of-the-art seismic data room with the latest Central Atlantic Programs and profiles. The conference will include courses on salt tectonics and petroleum systems modeling, and a core workshop

featuring wells from the Scotian Shelf and the adjacent U.S. Outer Continental Shelf.

Attendees will be able to view hydrothermal dolomites of the Late Jurassic Abenaki Formation in the cores from the Deep Panuke Field – during testing, the H-08 well flowed 50 to 57 Mmcf/d of natural gas.

Dave Brown, the conference co-chair, said the conference themes are extremely topical, given recent discoveries in offshore Nova Scotia.

"We have an active petroleum system, because wherever a reservoir was found, it was full of gas" said Brown, an AAPG member and senior petroleum geologist with the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB).

Diving Into the Scotian Basin

Brown and his CNSOPB colleagues attended the conjugate margin conference in Marrakech, where they presented papers on the resource potential and exploration play types of the Scotian Basin, which measures about 100 to 150 kilometers wide and about 900 kilometers long.

Water depths there vary from less than 100 meters to 3,500 meters.

The shallow waters of the Scotian Basin – the historical focus of exploration – contain 194 wells, with historical oil production from the Cohasset-Panuke Field and current natural gas production from the Sable Project. To date, 10 Tcf of natural gas and 381 million barrels of oil have been discovered in the shallow waters of the Scotian Basin.

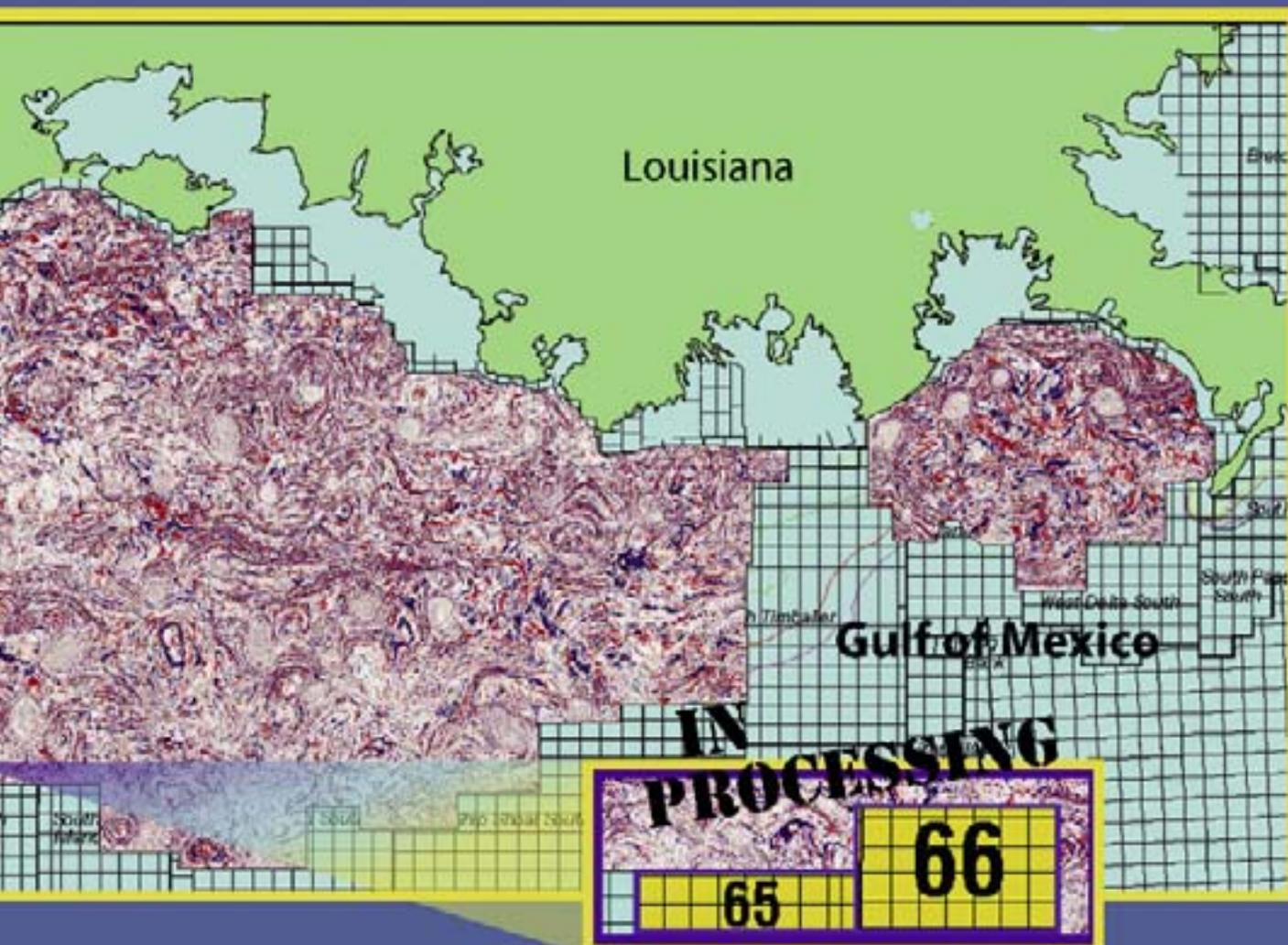
In 2006, the CNSOPB reported that another 17 Tcf of natural gas remained to be discovered in the Scotian Basin's

See **Margins**, page 22



Photos courtesy of Gela Crane

Out of Africa: These Nova Scotian outcrops tell a lot about conjugate margins.



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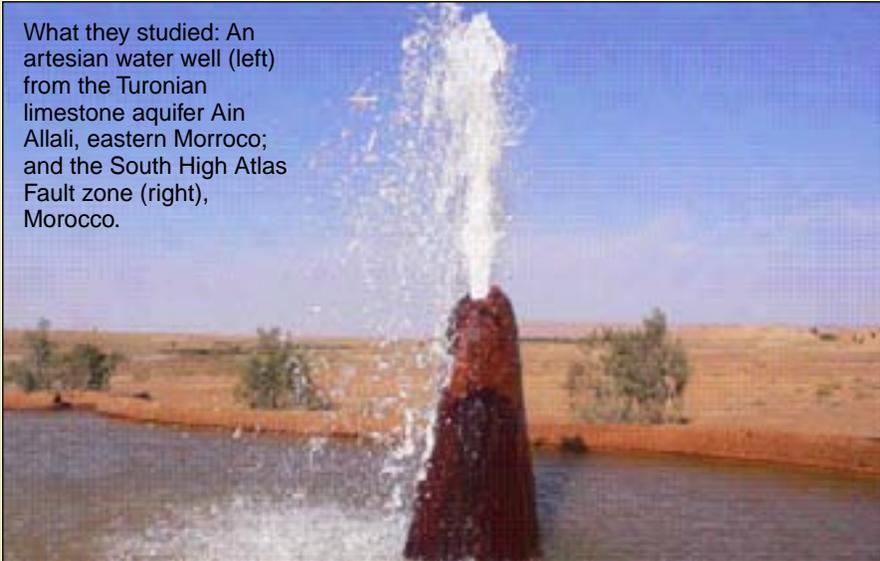
E. Cameron S. (65) & Vermilion South (66)

30,000' offsets, 11 second records processed in January 2008

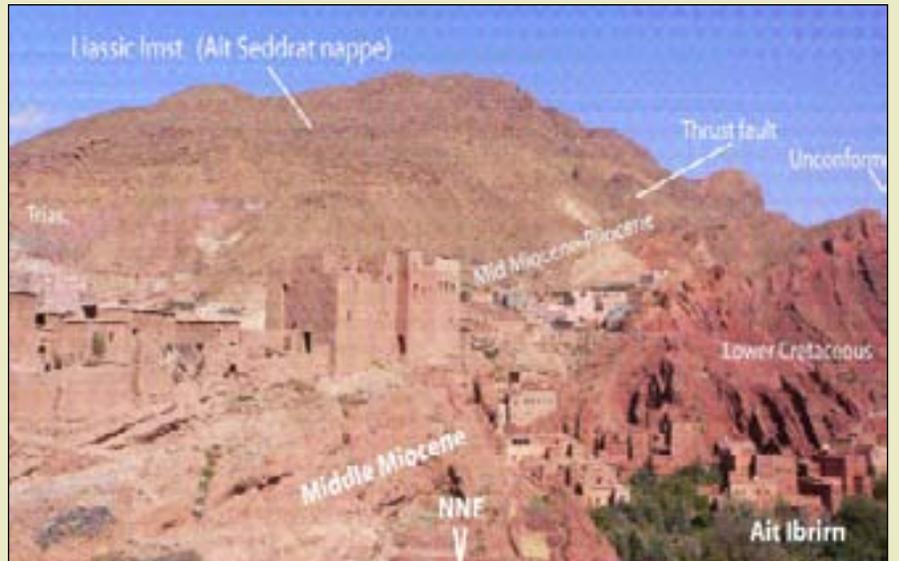
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What they studied: An artesian water well from the Turonian limestone aquifer Ain Allali, eastern Morocco; and the South High Atlas Fault zone (right), Morocco.



Photos courtesy of André Michard



Ideas, Analogs Promote New Plays

In late October, the Moroccan Association of Petroleum Geologists (MAPG), in association with AAPG and other industry associations, held the first MAPG International Convention Conference & Exhibition in Marrakech, Morocco.

"Revisit the Rocks; Realize the Potential" attracted more than 600 delegates (from 44 countries) interested in Pangean geology and in recent exploration and production activities in northwest Africa.

Al Moundir Morabet, the conference general chair, said he was extremely pleased by the international participation in the conference – 30 exhibitors, 328 abstracts presented in 50 different oral sessions, 144 posters and six field trips – especially given that

MAPG, as an organization, is only 10 years old.

"The conference," said Morabet, an AAPG member and general director of Tamouda Consulting (SARL), "was a photocopy of AAPG. We tried to bring the international industry and academic geoscience community to Morocco."

He acknowledged that AAPG was instrumental in promoting the conference, as were ONHYM, Morocco's National Office of Hydrocarbons and Mining, the International Lithosphere Programme and the Colloque du Jurassique Marocain.

Morabet said the conference allowed African and Moroccan geoscientists to present their ideas to their international peers.

"The conference was important to Africans," he said, "because African academic geoscientists don't often travel to international scientific conferences due to visas and travel costs."

MAPG described the conference theme by aptly quoting legendary geologist, the late Parke A. Dickey:

"We usually find oil in new places with old ideas. Sometimes, also, we find oil in old places with a new idea. But, we seldom find oil in an old place with an old idea."

"The recent discoveries show that the petroleum system is working," Morabet said, pointing to recent multiple significant discoveries in offshore northwest Africa. "We have to revisit the rocks with new ideas and new

technologies developed on the other side of the world.

"We're using Nova Scotian discoveries and analogs to promote our plays," he added.

Morabet cited attractive fiscal terms, direct negotiations and a 10-year corporate tax holiday as compelling reasons for the international oil and gas industry to explore offshore Morocco. According to Morabet, Morocco may also have the largest onshore reserves of oil shales in the world – more than 100 billion tons, with TOCs on the order of 10-11 percent.

Asked if Morabet and his associates from Morocco will be attending the upcoming conference in Nova Scotia, he answered: "You bet."

– SUSAN R. EATON



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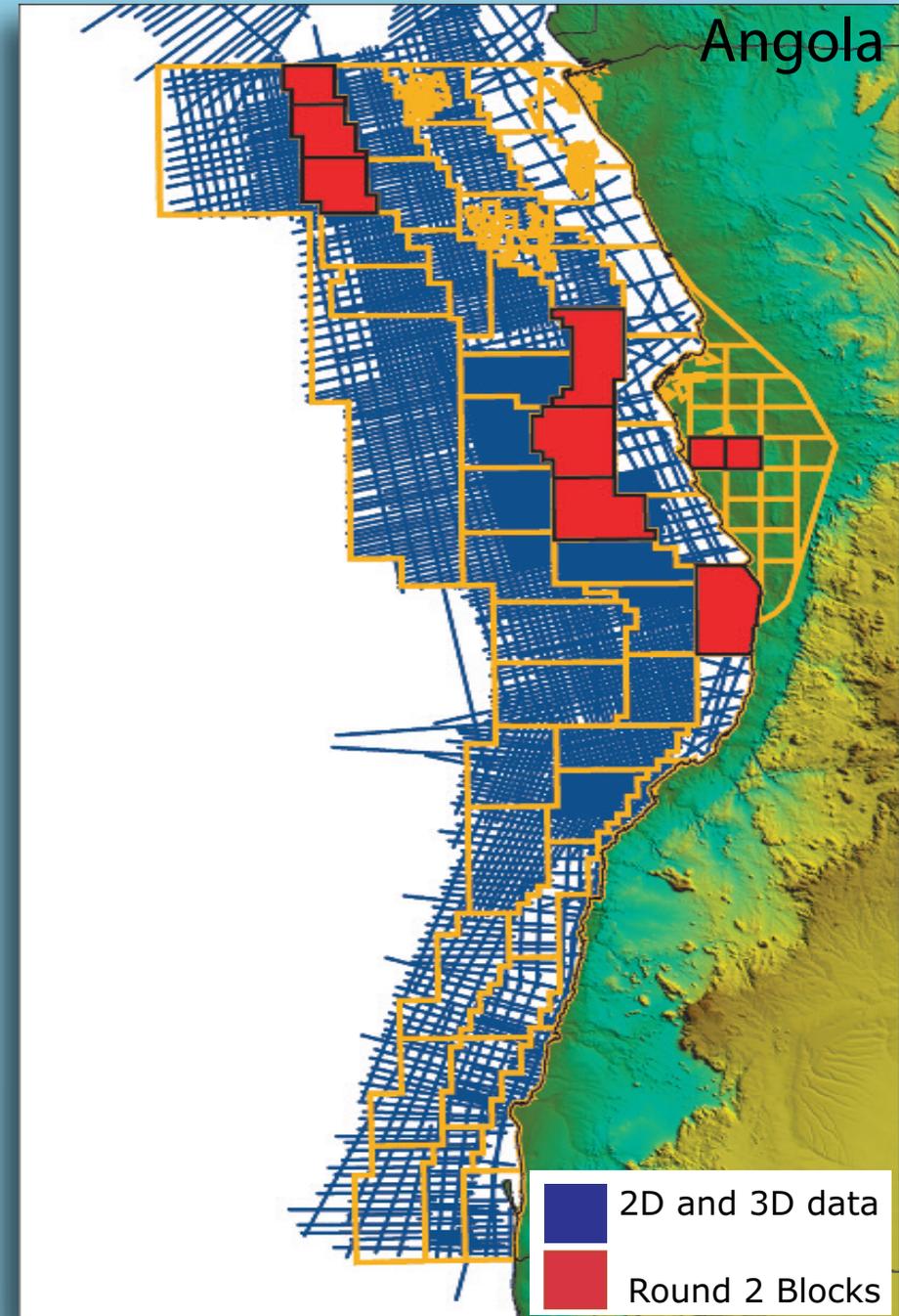
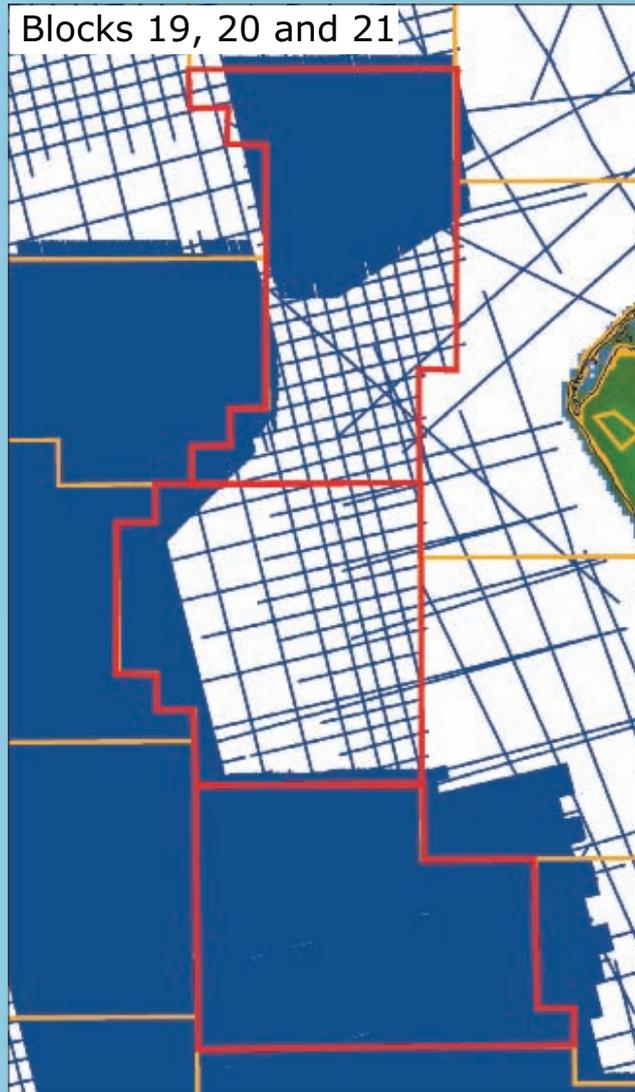
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Tectonics Lecture Sparked Imagination

By SUSAN R. EATON
EXPLORER Correspondent

I was in my first year of my geology studies during the mid-1970s – still trying to grasp the difference between igneous and sedimentary rocks – when a buzz of excitement overtook the Department of Geology at Dalhousie University in Halifax, Nova Scotia.

The professors exclaimed, in hushed and reverent tones:

"He's coming ... He's Canadian ... He's a geophysicist ... He's God ..."

"He" was J. Tuzo Wilson, the father of modern-day plate tectonics.

A neophyte in geology and geological processes, I simply thought

that "Tuzo" was a cool name.

Intrigued, I attended the lecture, and was mesmerized by J. Tuzo Wilson's interpretation of ancient Earth – the existence of hot spots in the mantle and the realization that the continental plates had all fit together before the break-up of the supercontinent Pangea – which made absolute sense to me, a geologist-in-the-making whose mind



Eaton

was an open book, free of historical theories and biases.

During my field studies at Dalhousie, I visited several outcrops in Nova Scotia and marveled that the same rocks also were exposed in Morocco.

Today, plate tectonics is the Holy Grail of geology, and it's sobering to discover that during the early 1960s J. Tuzo Wilson's manuscript was rejected by all major scientific journals because his theories were deemed too "radical." His manuscript was finally published in 1963 by the Canadian Journal of Physics.

The rest, as they say, "is history." □

Margins

from page 19

shallow waters. The CNSOPB's report also estimated the resource potential of the Deep Water Scotian Shelf at 17 to 57 Tcf of natural gas and 1.3 to 4.5 billion barrels of oil.

An industry review of the recent drilling activity in the Deep Water Scotian Shelf revealed that the deepwater sediments – targeted by 10 wells – were not actually penetrated. According to Brown, the drilling data confirm the offshore delta is broader than previously thought and the deepwater turbidite sand reservoirs lie, undrilled, further down the slope.

Brown's optimism about the deepwater prospectivity of the Scotian Shelf is further buoyed by recent analog discoveries in offshore Mauritania.

'Something for Everyone'

Grant Wach, the Halifax conference co-chair and a professor of petroleum geoscience and director of energy at Dalhousie University, described Dalhousie as one of the leading academic institutions in the study of tectonics along the Central and North Atlantic conjugate margins.

According to Wach, an AAPG member, all of the technical sessions will run in one venue – there will be no concurrent sessions, thus enabling all participants to attend all the papers.

"There'll be ample opportunity for academic geoscientists and industry explorationists to meet to exchange ideas," he said. "There will be something for everyone, from geodynamic modeling to regional geology and reservoir geology."

The Tide That Binds

Wach said the geology field trips have been planned with the tide charts in mind – that's because Nova Scotia's Bay of Fundy boasts the highest tides in the world, ranging up to 50 feet.

As such, many of the world-class outcrops can only be seen at low tide.

The Fundy Basin also is the largest and best-exposed early synrift basin in the Central Atlantic realm.

The pre-meeting field trips will include:

✓ The Permian to Jurassic rift successions.

✓ The Carboniferous section at Joggins, formed by salt withdrawal Cumberland Basin.

✓ The onshore Cretaceous reservoir equivalents of the production fields on the Scotian Shelf.

Post-meeting field trips will be led to:

✓ Morocco, to view the Triassic synrift reservoir facies and architecture.

✓ Portugal, to view the Jurassic carbonates and fluvio-deltaic successions in the Lusitania Basin.

Brown gets excited by the oil and gas potential of the virtually unexplored margin of North America.

"Imagine a carbonate bank fairway that extends several thousand kilometers from Nova Scotia, clear to Florida," he said, "that's been tested by only a handful of discovery wells at Deep Panuke and by two wells on the U.S. Outer Continental Shelf." □



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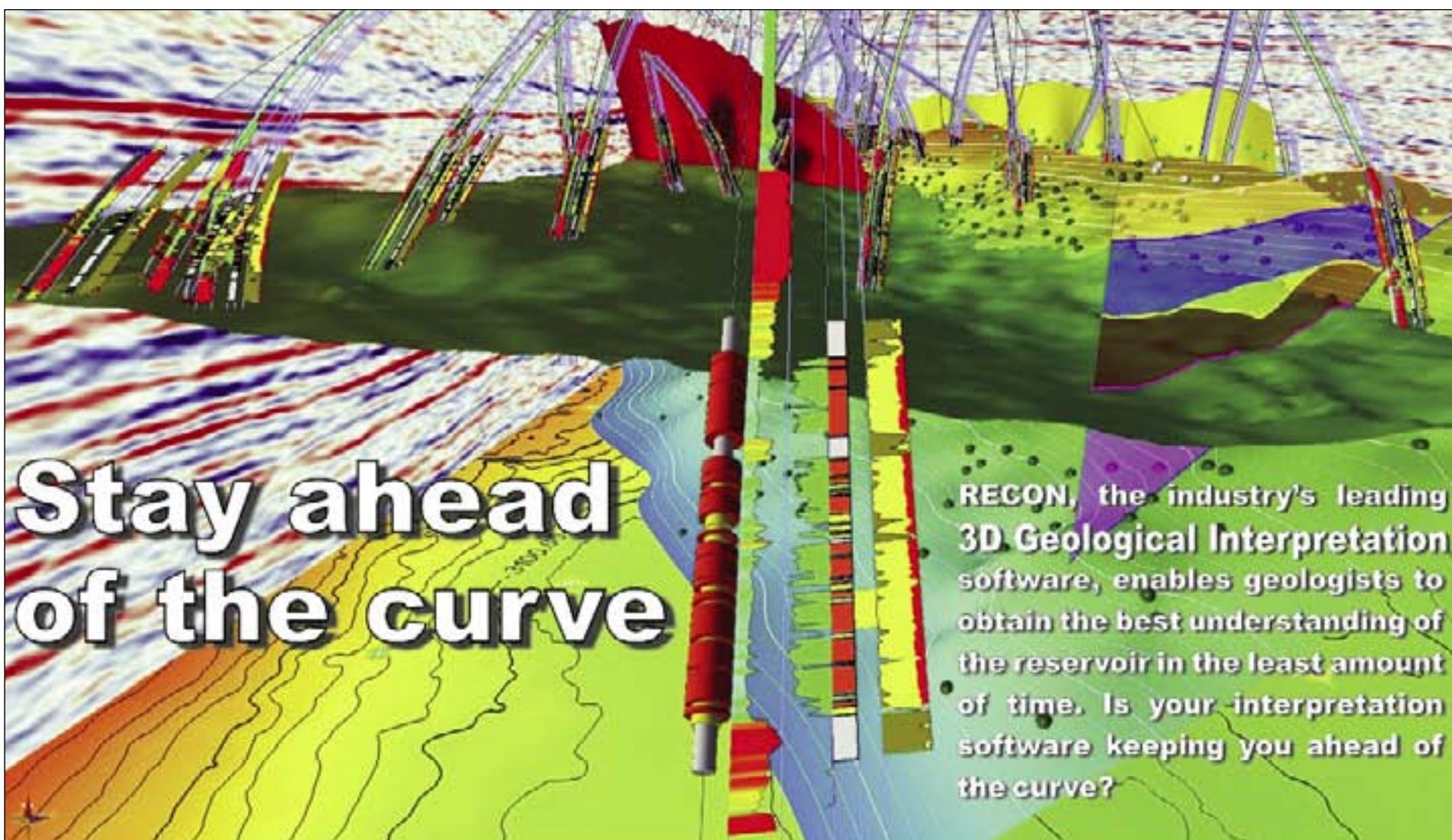
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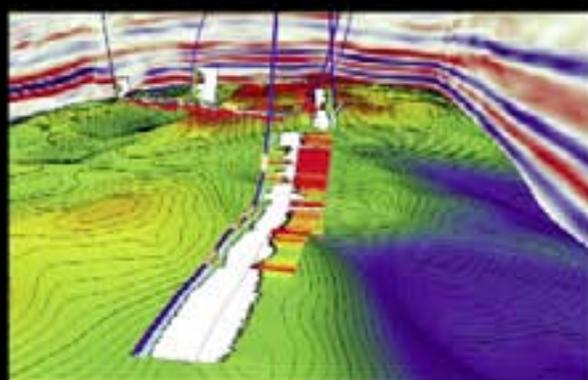


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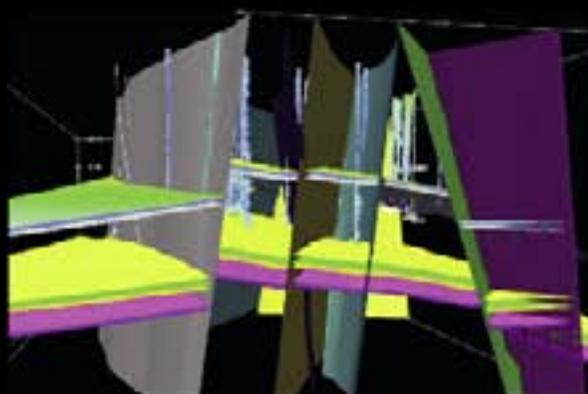
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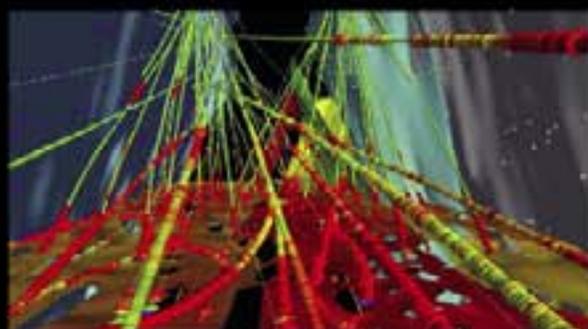
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Utah.....	135,429,658.25	Michigan.....	616,971.05
Colorado.....	122,894,226.71	Oregon.....	558,122.83
California.....	61,240,940.54	Ohio.....	493,091.99
Montana.....	39,158,279.03	West Virginia.....	389,004.34
Louisiana.....	24,029,594.03	Washington.....	366,365.07
Alaska.....	21,796,671.52	Virginia.....	233,474.14
Texas.....	21,667,264.63	Illinois.....	205,558.80
Alabama.....	14,173,908.88	Pennsylvania.....	55,584.87
North Dakota.....	13,775,447.53	Arizona.....	41,792.37
Arkansas.....	8,143,230.86	Nebraska.....	24,176.98
Nevada.....	7,663,678.82	Minnesota.....	13,126.30
Oklahoma.....	6,988,592.26	Indiana.....	8,046.75
Idaho.....	4,729,812.55	Florida.....	6,649.38
Missouri.....	3,598,352.32	South Carolina.....	277.50
Mississippi.....	2,226,547.50	Total.....	\$1,972,322,944.82
Kansas.....	1,876,305.00		

Royalties Provide Bonanza for States

Thirty-four states earned more than \$1.9 billion during 2007 (fiscal year) as part of their share of federal revenues collected by the Department of the Interior's Minerals Management Service (MMS), officials recently announced.

That figure is down from the 2006 fiscal year payments to states, which was \$2.2 billion, according to the MMS.

Officials said the slight decline is the result of several factors, including lower natural gas prices during the fiscal year and a drop in lease sale bonuses from the previous year.

MMS is the federal bureau within the Department of the Interior responsible

for collecting, auditing and disbursing revenues associated with mineral leases on federal and American Indian lands. Disbursements are made to states on a monthly basis from royalties, rents, bonuses and other revenues collected by MMS.

This marked the first full year that MMS distributed funds from geothermal energy production directly to the individual counties where that production occurs.

Randall Luthi, MMS director, noted the Energy Policy Act of 2005 mandated that 25 percent of receipts from geothermal energy production be disbursed directly to counties where that production occurs, in an effort to increase use of that alternative energy resource.

As part of that mandate, and included in the \$1.9 billion distributed overall, MMS distributed more than \$4.3 million to 32 counties in the states of California, Idaho, New Mexico, Nevada, Oregon and Utah.

Wyoming led all states in 2007 by receiving more than \$925 million (see chart) as its share of revenues collected from mineral production on federal lands within its borders, including oil, gas and coal production.

"These revenues from mineral production on federal lands play a crucial role in many state budgets," Luthi said. "The funds support everything from education to infrastructure improvements and capital projects." □



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Tupi

from page 14

region as compared to the Gulf of Mexico where several companies are experienced in the deepwater, including the subsalt environment.

Pilot production at Tupi reportedly may begin around 2010. There are guesstimates that as many as 100 wells may be required to develop the field, at a cost somewhere between \$50 billion and \$100 billion.

Carvalho noted the initial well at Tupi cost about \$240 million and required a year to drill.

Catch-22

Tupi may well be only the beginning when it comes to the region's potential for subsalt reservoirs, which offer the bonus of prized light crude oil.

"There could be huge reserves in the subsalt offshore Brazil under the Campos, Santos and Espirito Santo basins," Carvalho said. "The subsalt could be a whole new play beneath the most prolific basins in the Brazil region, and one with better quality oil."

"The subsalt crude is higher quality, about 30-degree API," Carvalho noted. "Brazil has very heavy oil on average, about 16-degree to 17-degree."

There's a catch-22 here. Given the estimated cost to develop Tupi and any future big subsalt finds nearby, it's crucial that crude prices remain at relatively lofty levels. On the other hand, skyrocketing commodity prices have played a key role in the current labor and construction bottlenecks that are hindering development in proven fields. □



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HALLIBURTON

Stories make hills 'come alive'

Filmmakers Share Love of Rocks

By KEN MILAM

EXPLORER Correspondent

Oklahoma marked 100 years of statehood in 2007. Centennial events, exhibits and programs celebrated the 47th state's history from pre-Columbian times to the present.

Filmmakers Todd Kent and Devin Dennie are digging even deeper into the state's past.

Their new documentary, "Oklahoma Rocks!" celebrates the state's "pre-history" – "looking at what the science of geology tells us of how Oklahoma came to be," Dennie said.

The state's diverse geology offered a rich vein of material for the duo, who logged hundreds of hours and thousands of miles pursuing the project over the last year.

While people picture Oklahoma as a Plains state, overlapping landscapes vary from pre-Cambrian metamorphic rock formations to Cretaceous stones holding dinosaur bones to Ice Age sand dunes, all within a couple hours' drive of each other, Dennie said.

The barren granite Wichita Mountains in the state's southwest corner, for example, contrast greatly with the richly forested Ouachita Mountains in the southeast, he said.

In addition to tourist vistas, the film touches on the geology behind the state's industry and economy, examining the contributions of petroleum, minerals and mining – and even sand and gravel – to the area.



Photos courtesy of Explorer Multimedia Inc.

Getting down to business: Award-winning filmmakers Todd Kent and Devin Dennie, filming a segment that will help showcase geology to the general population.

Centennial events also helped the pair by putting a lot of history on display, Dennie said, referring to how in one case a visit to a Paleo-Indian buffalo kill site offered evidence of how indigenous inhabitants used geology to their advantage.

Early hunters drove the bison into

narrow canyons and over the edge of cliffs.

Interviews with experts and interesting visuals are being condensed into a quickly paced 60- to 90-minute package that Kent and Dennie hope will appeal to the general public as well as hold the attention of

younger viewers.

A trailer for the film and outtakes are on youtube.com (search "Oklahoma rocks").

Long-Lasting Teamwork

Scheduled for November release, "Oklahoma Rocks!" is not the pair's first movie. "Rockhounds: The Movie" focused on gem and mineral collectors. The movie was filmed in several states and screened in venues worldwide.

"Rockhounds" won the American Federation of Mineralogical Societies' Excellence in Education Award.

A portion of the film was shown as part of the "OK Rocks!" exhibit at the Sam Noble Museum of Natural History in Norman, Okla., for more than a year, Kent said.

Another film featured the East Texas oil field, and a 1999 television show, "North Texas Explorer," aired in several states, Kent said.

Nor is this project the first time AAPG members have had a chance to encounter the team. The two gathered footage for their projects at the 2004 AAPG Annual Convention in Dallas, interviewing geologists and going on a pre-convention field trip (August 2004 EXPLORER).

The pair grew up in north Texas and

continued on next page



continued from previous page

have known each other since the first grade.

Dennie, a petroleum geologist with Devon Energy, does most of the research and is the on-camera host for the films. Kent, a professional filmmaker, said he is "the production guy."

They formed their non-profit production company, Explorer Multimedia Inc., in 2003.

It is a "frugal organization," Kent said, with the two friends doing most of the work themselves in their spare time.

Store and online sales are planned

For more information about the movies "Oklahoma Rocks!" and "Rockhounds: The Movie" – and the production company behind them – visit www.okgeology.com or www.explorermultimedia.org

for "Oklahoma Rocks!" The filmmakers also are seeking out potential financial contributors to help pay for the movie's distribution.

The Science of Your Life

The pair has hundreds of ideas for future films, according to Dennie.

"There are 49 other films out there like this," he said, "and there are still things out there (in Oklahoma) we haven't gotten.

"I'm interested in the science of your backyard," he added. "The things you drive past every day on your way to work, the rocks kids play on, that well in the back pasture – where does it go ...?"



The great American ... plains? A new film on Oklahoma geology will help show the state's contrasts and complexities – and look at how geology impacts the state's industry and economy.

The films also capture some of the knowledge of older experts "who have a lot of insights to share," he said.

The movies "help show why some people would spend their lives studying these things," he said.

In the meantime, the pair wants to put "Oklahoma Rocks!" into as many venues as possible. They hope to show the movie at film festivals and offer screenings for geological societies and other organizations.

"We'd like to put a copy on the desk of every high school science teacher in Oklahoma," Dennie said.

"We hope you don't have to look very far to see it." □

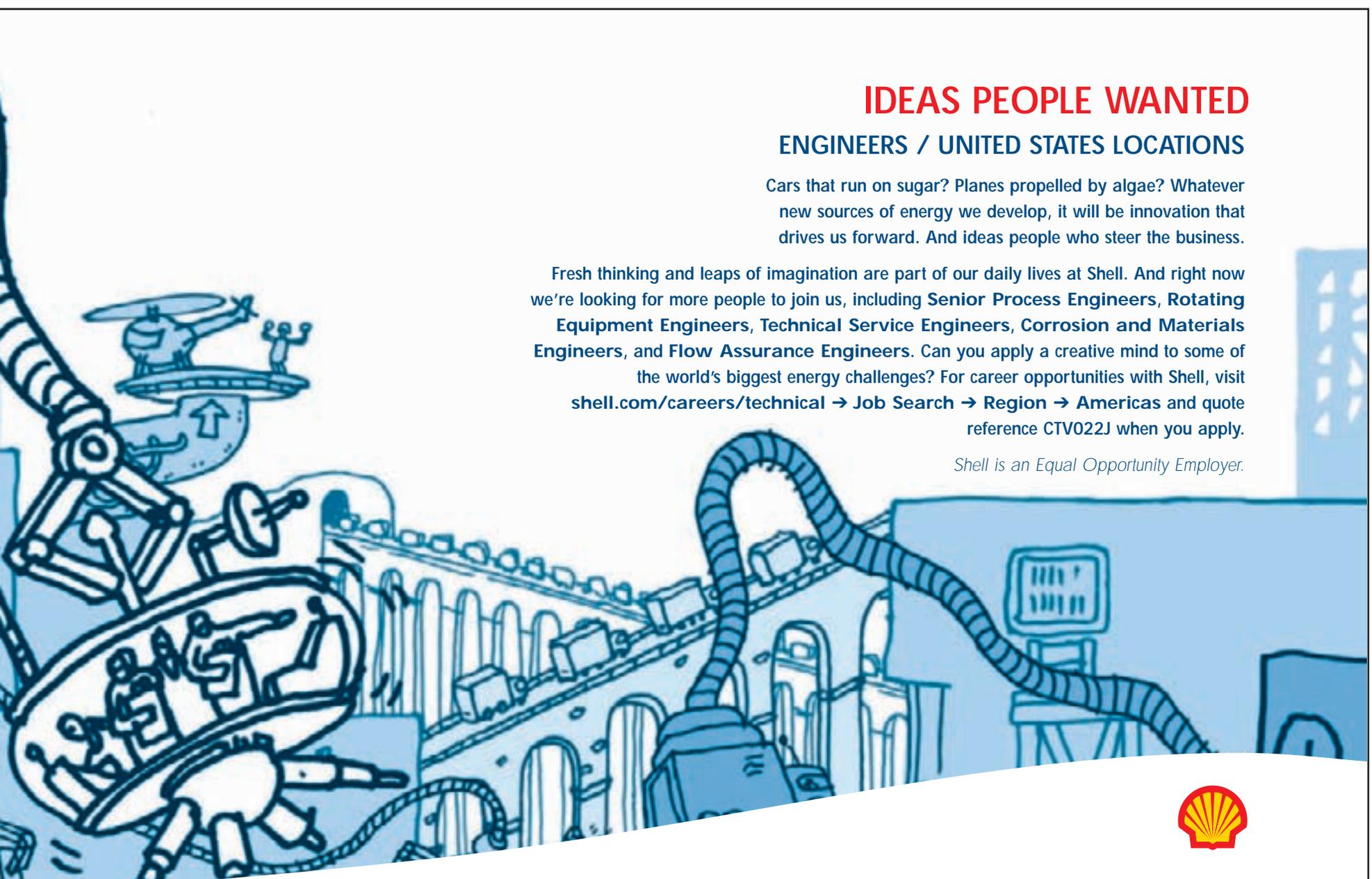
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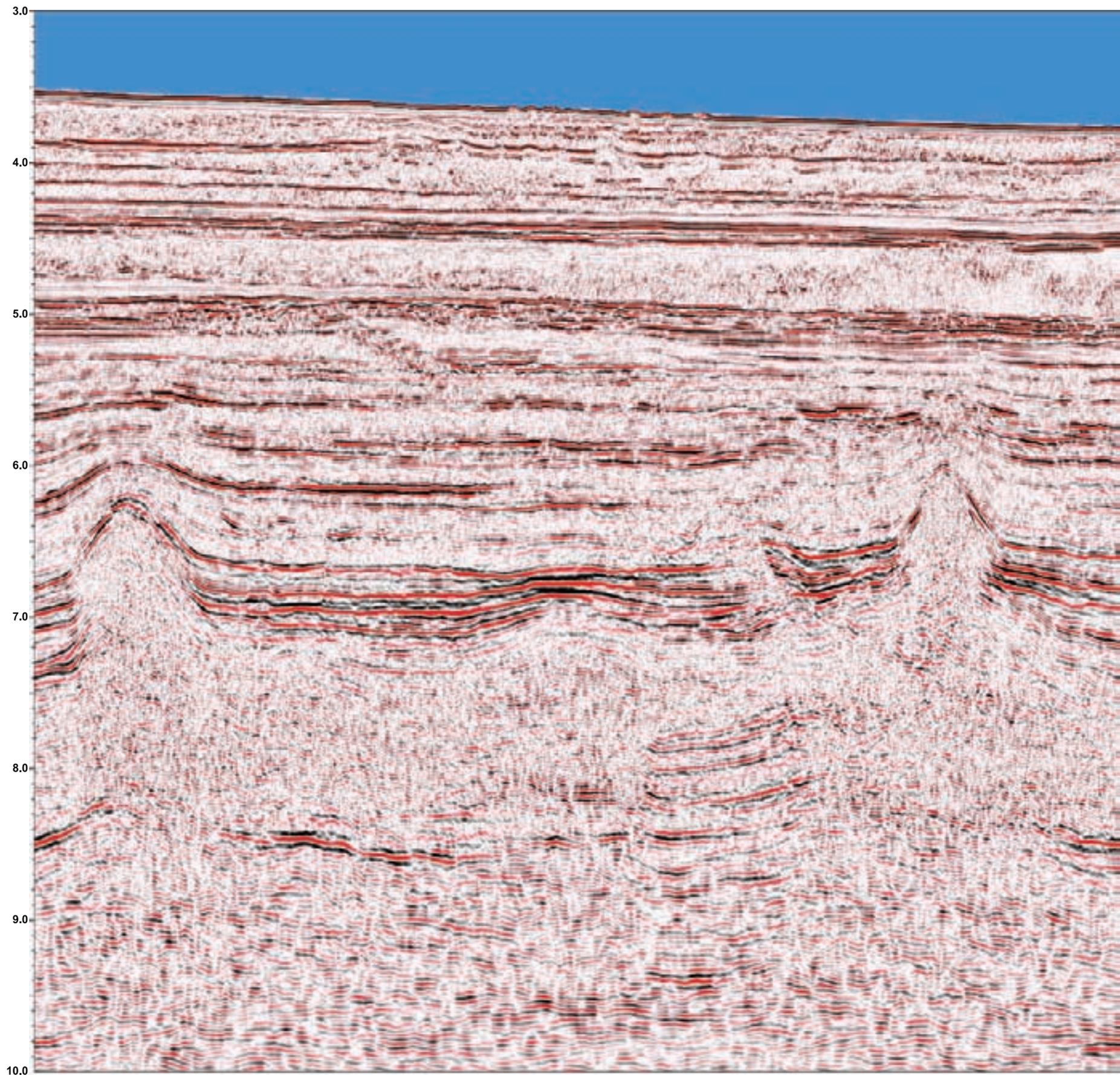
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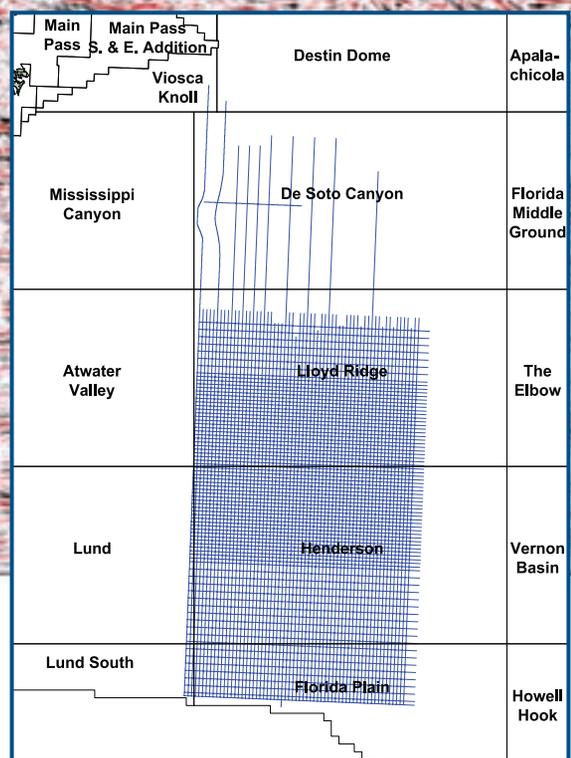
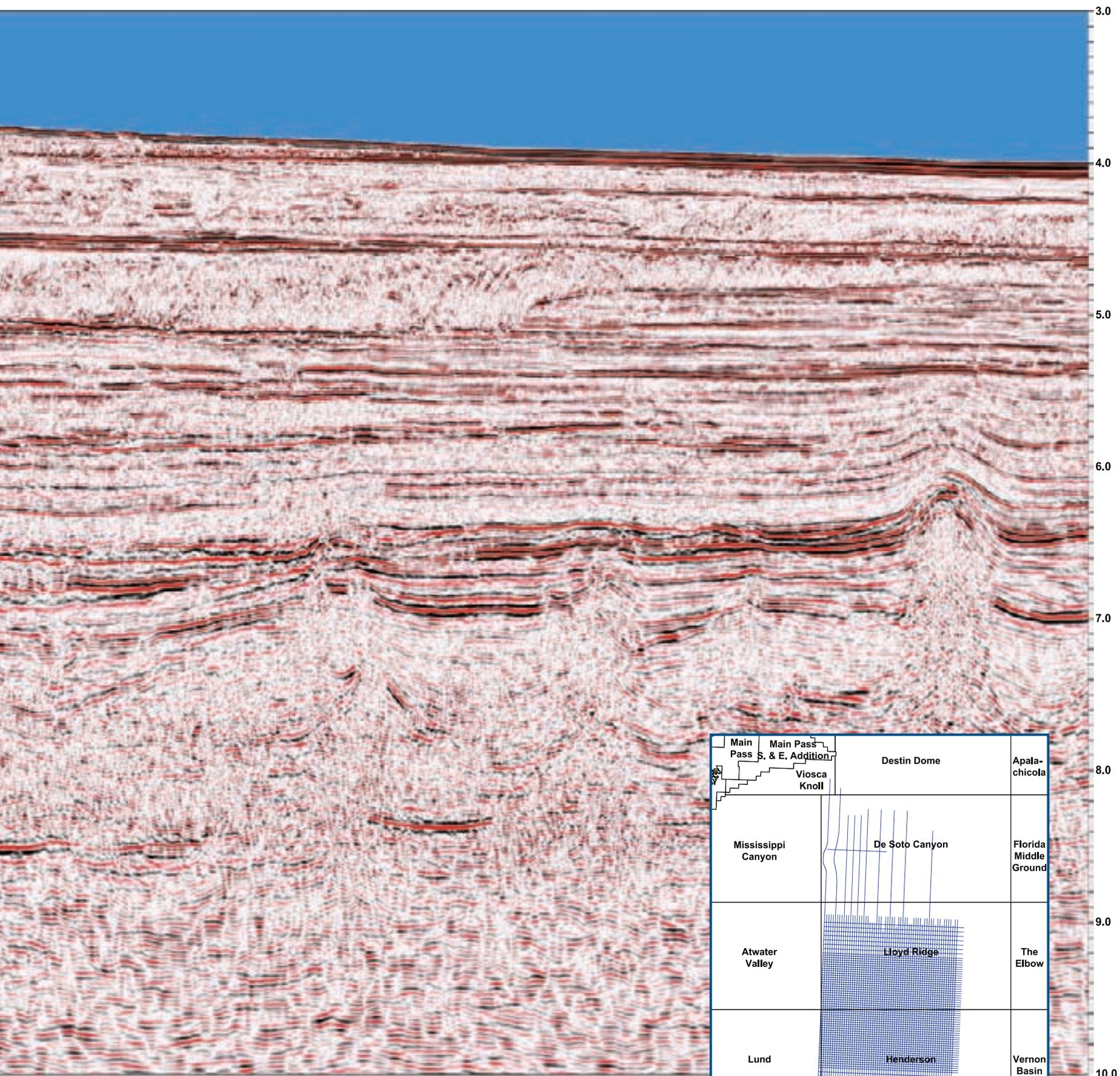


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WASHINGTONwatch

Curtiss Assumes Reins at GEO-DC

David K. Curtiss has assumed the directorship of the AAPG Geoscience and Energy Office in Washington, D.C. (GEO-DC), after serving as deputy director of the office since its inception in mid-November 2005.



Curtiss

Curtiss succeeds Don Juckett, who served as director of the GEO-DC since its launch and is retiring to focus on his consultancy and as director of Far East Energy Corp.

Juckett also will continue to serve GEO-DC in a senior advisory capacity.

As GEO-DC director, Curtiss will:

- ✓ Represent government affairs interests of AAPG members.
- ✓ Provide information to federal state government officials and staff.
- ✓ Develop opportunities for AAPG members to engage in the policy process.

The GEO-DC office is located at the headquarters of the American Geological Institute in Alexandria, Va.

* * *

Curtiss previously served as manager of international strategy and development and was senior adviser to the director of the Energy and Geoscience Institute (EGI) located at the University of Utah.

In that position he was involved in

government affairs on behalf of EGI, developed strategic alliances and assisted in identifying and developing research programs, was involved in public outreach, developed marketing strategies, conducted contract negotiations and was primary liaison with EGI's 63 international industry sponsors.

He also contributed his geologic expertise to industry-funded petroleum studies in Algeria, Argentina, Azerbaijan,

Colombia, Egypt, Kazakhstan, Morocco, Russia, Turkmenistan, Uganda and the United States, plus several global exploration opportunity assessments.

Curtiss first joined EGI in 1993 as a research assistant and was manager of program development when in 2001-02 he served as a Legislative Fellow, serving in the office of U.S. Rep. J.C. Watts (R-Okla.), who also was chairman of the Republican Conference in the U.S. House

of Representatives.

In that position Curtiss got an insider's view of the legislative process, with duties including advising Watts and senior staff on energy, foreign policy, Third World indebtedness and cyber- and homeland security. He also was charged with seeking legislative solutions for technology infrastructure development at minority-serving colleges and universities, climate change, urban and rural community renewal.

He also prepared articles, speeches and press releases.

Curtiss has a bachelor's degree in geology from Wheaton College (Ill.), a master's degree in earth resources management from the University of South Carolina and a master's of business administration from the University of Utah.

He is a registered geologist in Utah and a member of AAPG.

"The experience and contacts David has gained in his work with industry, academia and Congress plus working closely with Don Juckett over the past two years, combined with his energy and ability to communicate with scientists, business leaders and policy makers, will ensure a smooth transition of leadership in the office and the continued effectiveness of GEO-DC," said AAPG Executive Director Rick Fritz.

(Editor's note: David Curtiss, head of AAPG's Geoscience and Energy Office in Washington, D.C., can be contacted at dcurtiss@aapg.org; or by telephone at 1-703-575-8293.)

Mark your calendars for Congressional Visits Day on March 4-5.

One of the first items on Curtiss' agenda is planning for the upcoming Congressional Visits Day (CVD), organized by the Science-Engineering-Technology Working Group.

For the past 12 years this annual event has brought scientists, engineers, researchers, teachers and executives to Washington, D.C., to talk to Congress about the importance of science, engineering and technology.

AAPG members have regularly participated in the event, especially the last two years, and the momentum from last year's meeting led to the formation of the Washington Advocacy Group, a Government Affairs subcommittee chaired by past DPA president Deborah Sacey that is intended to promote increased engagement between AAPG members and policy makers.

At the event:

- ✓ On Day 1 participants receive

briefings on federal science and technology activities, with a special session devoted to the geosciences.

The sessions also include information and suggestions for how to conduct a successful Congressional briefing, and participants receive materials to leave behind at these meetings.

The day wraps up with a reception on Capitol Hill.

- ✓ Day 2 begins with breakfast back on the Hill, followed by participants' meeting with the offices of their respective member of Congress and senators (schedules permitting).

For more information about Congressional Visits Day and regular updates visit <http://www.setcvd.org/cvd2008/index.html>.

Space is limited for this event and will quickly fill to capacity.

Contact David Curtiss if you plan to attend. □

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*Noticeable upward trend***More Women Joining Geologist Ranks**

By SUSIE MOORE
EXPLORER Staff Writer

A noticeable transformation continues to thrive within the geosciences community.

Women are becoming more prevalent and, increasingly, more prominent in the ranks of AAPG and throughout the energy industry.

At first the evidence was largely anecdotal – anyone who has attended an AAPG annual convention in recent years could spot a rise in the number of women who were not just attending the meetings but participating in the technical program.



Ali-Adeeb



Dombrowski



Zahm

But now, officially, the saturation of women in the geosciences field within the last 10 years is a quantifiable

upward trend, according to an August 2005 report conducted by the American Geological Institute, the American Geophysical Union and the Statistical Research Center of the American Institute of Physics.

The study, taken from the class of 2003, shows women have increased their representation among geoscience Ph.D.s, with women

earning 33 percent of earth, atmospheric and ocean sciences doctoral degrees.

"There *has* been an increase in women in the petroleum industry," said AAPG member Laura Zahm, part-time member for the sedimentology and stratigraphy services group for ConocoPhillips in Austin, Texas.

"I chose a career in the geosciences because it captured my imagination and at the same time pushed and stimulated my intellectual capabilities," said Jessica Moore Ali-Adeeb, geologist for Chevron and the Association for Women Geoscientists (AWG) president.

"There are so many facets to the earth sciences, which allow it to be a lifelong professional pursuit as well as one of my favorite hobbies.

"What more could a girl ask for?" she added, "I have a hobby for work!"

And like dominoes falling down in succession, this increase in the number of women in the profession has resulted in more women assuming leadership roles in the industry, thereby making more women key decision-makers, thereby affording them the opportunity to mentor the younger generation following in their footsteps.

"More women in the industry has changed the need for companies to offer alternative employment options for women who fill a niche in a team, but still would like to have the flexibility to spend time with their families," according to Zahm.

"The petroleum industry is no longer a 40-hour-a-week-at-the-office-or-nothing type of industry," she said, "Many women are working from home, working part time or job sharing."

Of course, Zahm is slightly biased to this versatile concept because of her current alternative employment position. Still, she believes it is an option becoming more common in the workplace.

Obstacle Course

Anna Dombrowski, a staff geologist with Shell in Houston, agrees there has been a steady climb in the number of women within the petroleum industry. However, she recognized a significant change in how women in the geosciences were viewed beginning in the early 1990s.

"There was a big change in corporate culture," said Dombrowski, also an AAPG member. "More respect came with the awareness of the legal ramifications if you discriminated against a woman."

Dombrowski remembers a time when she couldn't get a job in the geosciences. It was in the early 1970s – a transitioning period for many women in the work force.

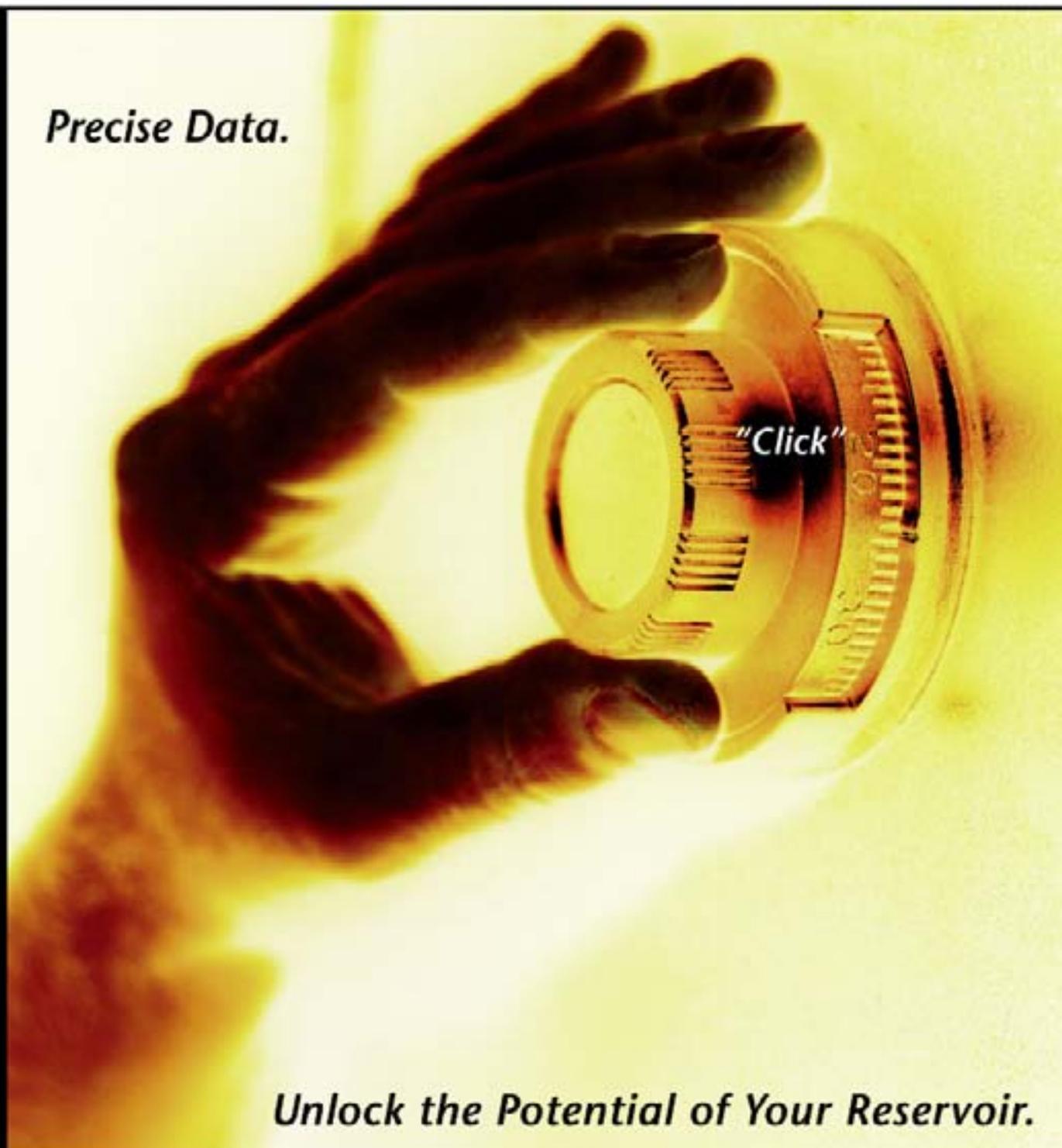
It was a time when "women were not taken seriously," she stated.

"Even after graduating with honors," she said, "I applied for a position with a major oil company and was rejected on the basis that I was single."

Not too long after, Dombrowski married. She then applied for another position in a major oil company and was rejected on the basis that she was married.

After finally being offered a position in the geosciences industry, Dombrowski was paired with a mentor who let her

continued on next page

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'Characters' Toast GSL's Bicentenary

It's the Geological Society of London's 200th anniversary of its founding, and a birthday banquet held in November celebrated its beginning – in period costume and character.

The dinner was held at the New Connaught Rooms 61-65 Great Queen Street, London – on the exact site of the original Freemasons' Tavern, site of the first gathering of the 13 founders in 1807.

Following a reception and dinner, festivities included past AAPG President M. Ray Thomasson, giving words of congratulations as "William Pinkney, Minister Plenipotentiary, delivered on behalf of Thomas Jefferson."

As Pinkney, Thomasson said, "President Jefferson has had a keen interest in natural science for many years. As past president of the American Philosophical Society, Mr. Jefferson described in detail the bones of a clawed quadruped, which Dr. Charles Peale of Philadelphia identified as those of a giant sloth. He was flattered to have it named *megalonyx Jeffersoni* – the first such mammal found in the New World."

"Pinkney" also said, "I would like to

say that I can only hope that we Americans who owe so much to Great Britain's leadership in government, the arts and science will in time develop a sister geological organization which could affiliate with you."

But first, there were a few items to take care of, such as five years later the War of 1812 and the burning of Jefferson's former home – the White House.

However, all is persevered and 200 years later, toasts are offered from the GSL's younger sister organizations as it enters its third century. □



Past AAPG president M. Ray Thomasson, left, as "William Pinkney, Minister Plenipotentiary," and John Brooks, past AAPG Europe Region president, offered toasts at the 200th anniversary celebration of the Geological Society of London.

continued from previous page

know he didn't want to be her mentor – he *had* to be her mentor.

"His words to me were, 'You should be barefoot and pregnant at home,'" she said.

Yes, times have changed.

The Role of Mentors

Both Dombrowski and Zahm agree on the importance of mentorship to other women in the geosciences industry – "to be a contributing member of society and to leave something behind better than how you found it," as Zahm stated.

"One way to give back to the industry is to serve in leadership roles and play the role of mentor wherever possible to those with less experience," Zahm said.

"Women have made a conscientious effort to reach out to the younger generation, to provide advice and to build contact networks where someone who is new to the industry feels that there are people who have their best interests at heart."

Besides mentorship, there are programs available to help increase the number of women in the geosciences such as the Stop the Leaky Pipeline program formed by the AWG.

AWG, an AAPG associated society founded in 1977 in San Francisco on the principles to provide encouragement to women in the geosciences, recently celebrated its 30-year anniversary. Consequently, its membership approaches 1,000, reflecting the increasing participation of women in the geosciences.

And as for the future of women in the geosciences industry, "I've seen a trend that is continuing – a real trend," Dombrowski said.

"Being a woman is not an issue anymore." □

How Can Petroleum Companies Make Better Decisions?



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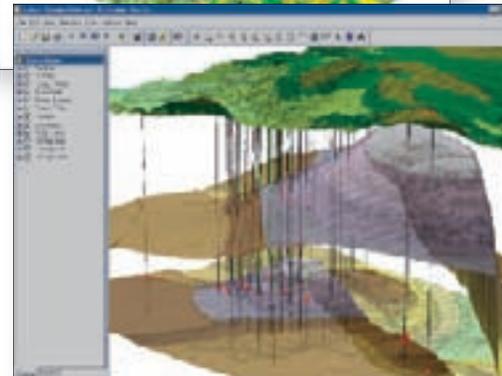
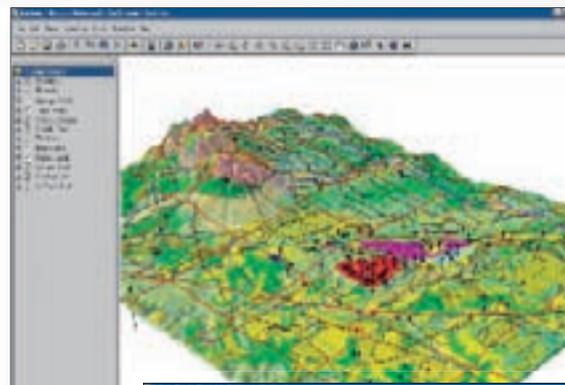
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GEOPHYSICALcorner

Rocks-Physics Theory a Help

(The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month's column deals with imaging sand/shale geology with multicomponent seismic data.)

By BOB HARDAGE

DIANA SAVA

RANDY REMINGTON

and MICHAEL DeANGELO

Examples of P-P and P-SV seismic images of deep geologic targets across the northern shelf of the Gulf of Mexico (GOM) are illustrated in figure 1, with the P-SV data warped to P-P image-time coordinates.

This time warping is a first-order depth registration of P-P and P-SV images, implemented by using an averaged V_P/V_S velocity ratio function for the area to adjust P-SV image time to P-P image time. This first-order adjustment of P-SV image time to P-P image time is sufficiently accurate to allow equivalent geology to be identified in side-by-side comparisons of P-P and P-SV data.

Comparing the seismic responses at the primed and unprimed number locations in each image space shows that each elastic wave mode provides different – but equally valid – sequence and facies information about subsurface geology, which is a fundamental principle of elastic wavefield stratigraphy.

Structural features A and B are interpreted to be depth equivalent. The time-warping process positions A and B in time-warped P-SV space to within 100 ms of their positions in P-P image space.

A salt structure blanks out both P-P and P-SV images approximately midway between CDP coordinates 19,600 and 21,000. Features 1 through 4 on the P-SV image indicate a cyclic depositional process that is not obvious in the P-P image (prime numbers 1? through 4?).

Feature 5 is an example of P-SV data showing strata that are not present in the P-P data (position 5?).

Feature 6 is an example of the P-P mode providing a better image of high-dip strata than does the P-SV mode (event 6?) along this particular profile. On other profiles in the area, the P-SV mode often images high-dip strata better than does the P-P mode.

* * *

Rock-physics theory helps us understand why these P-P and P-SV reflection images are both correct depictions of deep geology and yet they still have the spectacular differences illustrated by features 1 through 5.

A key concept to keep in mind is that the GOM rocks imaged in figure 1 have a significant amount of clay. Laboratory analysis of GOM core samples by Han have led to the relationships between P-wave velocity (V_P), S-wave velocity (V_S), porosity, and clay content that are noted for layer 2 of the stratigraphic model in figure 2.

These rock-physics equations are important because:

- ✓ They are based on laboratory measurements made on real rocks.
- ✓ The rock samples come from geology imaged by the seismic data in figure 1.

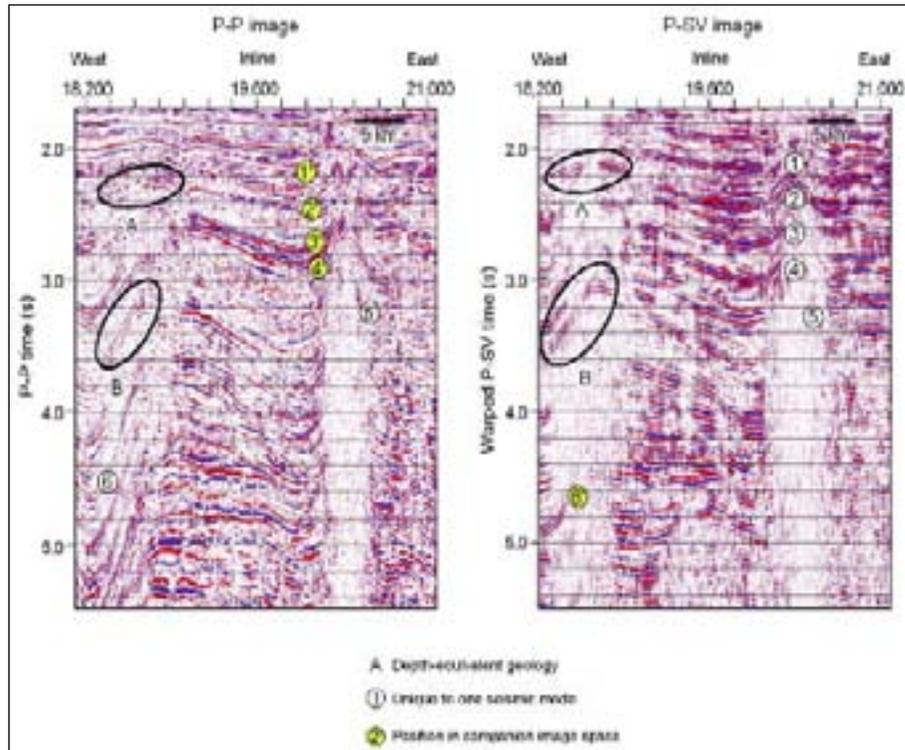


Figure 1 – Depth-equivalent P-P and P-SV images of deep Gulf of Mexico geology. A and B define depth-equivalent geology. Numbers 1, 2, ... indicate a sequence or a facies in one image space that is not seen in the companion image space. Prime numbers 1, 2, ... show where numbered sequence or facies should appear in the companion image space.

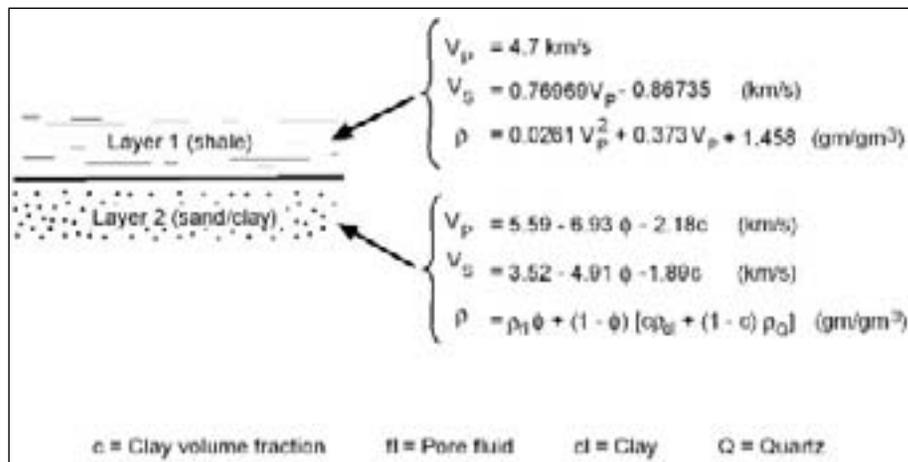


Figure 2 – Earth model used to demonstrate the effect of clay content on P-P and P-SV reflectivities. Equations used to specify the properties of Layer 1 (shale) come from Castagna and others. Those used to specify the properties of Layer 2 are from Han and others.

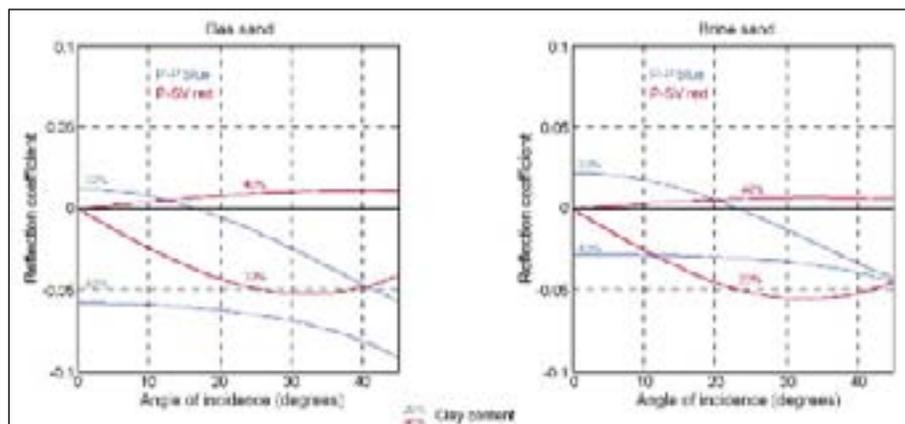


Figure 3 – P-P and P-SV AVA behaviors for varying clay content in a target layer. Layer 2 is assumed to be a sand unit with a porosity of 20 percent. Pore fluid (left) is 100 percent gas; pore fluid (right) is 100 percent brine.

✓ The rocks that were analyzed in the laboratory had a wide range of clay content.

To illustrate the value of this rock-physics theory we used the simple, two-layer Earth model in figure 2 to represent a typical reservoir target beneath the

northern shelf of the GOM.

The upper layer of this model was kept constant, with its petrophysical values defined by the equations in the figure, whereas clay content and pore fluid were varied in the lower layer.

Resulting P-P and P-SV reflectivities

from the two-layer interface, assuming a porosity of 20 percent for the sandstone reservoir, are displayed in figure 3.

These reflectivity curves provide an important message concerning P-P and P-SV images of siliciclastic rocks that have spatially variable clay content:

✓ For certain clay-content concentrations (c), the target layer is practically invisible to the P-P seismic mode but generates a strong P-SV reflection. For example, when $c = 20$ percent, P-P reflectivity is small and changes algebraic sign near an incidence angle of 20 degrees for both gas-filled and brine-filled sands.

These two reflectivity characteristics are classic examples of a reflection event that is minor – and probably invisible – in a final-processed P-P image. In contrast, P-SV reflectivity for each sand facies (gas or brine) when $c = 20$ percent is reasonably robust and has a constant algebraic sign at all incidence angles.

This P-SV reflectivity behavior should create a significant P-SV reflection event. Cyclic clay deposition of this concentration level appears to be a strong contributor to the different appearances of P-P and P-SV events labeled with primed and unprimed numbers 1 through 4.

✓ At other clay-content concentrations, the target layer is a poor P-SV reflector but a robust P-P reflector. For example, when $c = 40$ percent, P-P reflectivity is 6 to 10 percent across the total angle range for a gas-filled sand (left) and 3 to 5 percent for a brine-filled sand (right).

In contrast, P-SV reflectivity does not reach a 2 percent value for either sand facies until the incidence angle is 30 degrees to 45 degrees. This level of clay concentration will produce bold P-P reflections and weak P-SV reflections, similar to the image windows between primed and unprimed numbers 3 and 4.

* * *

Variations of clay content in GOM sandstones can thus cause certain intervals of depth-registered P-P and P-SV data to have P-SV seismic sequences and facies that differ from P-P seismic sequences and facies – and yet both the P-P image and the P-SV image are correct images of the geology.

Features 1 through 5 on the data displayed in figure 1 are examples of such reflectivity behaviors.

These differing P-P and P-SV sequences and facies provide a deeper and richer insight into rock physics and geology than do seismic sequences and facies produced by single-component seismic data.

Explorationists working in areas having clay-dominated siliciclastic rock units should consider utilizing multicomponent seismic data to evaluate prospects rather than relying on P-wave data alone. □

Seismic data were provided by WesternGeco. Research funding was provided by DOE contract DE-FC26-04NT42239.

(Editor's note: Bob Hardage, Diana Sava, Randy Remington and Michael DeAngelo are all with the Bureau of Economic Geology, Austin, Texas.)

PROFESSIONALnewsbriefs

Laurel L. Alexander, to senior geologist, North Coast Energy, Youngstown, Ohio. Previously senior geologist, Chesapeake Appalachia, Charleston, W.Va.

C. Riley Bates, to senior geologist, Plains Exploration and Production, Houston. Previously district geologist, Pogo Producing, Houston.

Joel Blake, to vice president-exploration, Plymouth Resources, Tulsa. Previously business development geoscientist, Williams Companies, Tulsa.

David Brumbaugh, to geophysicist, Newfield Exploration Mid-Continent, Tulsa. Previously geophysicist, Pogo Producing, Tulsa.

John S. Chimahusky, to vice president and chief operating officer-U.S. operations, Enterra Energy Trust, Calgary, Canada. Previously president, Kirkpatrick Oil, Oklahoma City.

Steven A. Fall, to president and chief executive officer, Heartland Oil and Gas, Stafford, Texas. Previously chief geologist, Universal Property Development and Acquisition Corp., Stafford, Texas.

Joe Finneran, to subsurface appraisal leader-CCS technology, BP Alternative Energy, Houston. Previously well planning team leader-Chirag-DWG, BP Azerbaijan, Baku.

Daniel Franken, to geophysical specialist, Saudi Aramco, Dhahran, Saudi Arabia. Previously senior geophysicist, RWE Dea AG, Hamburg, Germany.

Stephen Hamm, to vice president-exploration, Providence Energy Group, Houston. Previously senior geologist, Seven Energy, Houston.

David R. Keller, to independent consultant, Salt Lake City. Previously reservoir modeler, Norwest Corp., Salt Lake City.

John Leone, to explorationist, Whiting Oil and Gas, Midland, Texas. Previously petroleum geologist, Chevron, Midland, Texas.

Jim Lowe, to staff geologist, Southwestern Energy, Houston. Previously consulting geologist, Devon Energy, Houston.

Peter McCabe has assumed the role as president, American Geological Institute, Alexandria, Va. McCabe is research director, CSIRO, North Ryde, Australia.

John McDonald, to chief technology officer, Chevron Corp., San Ramon, Calif. Previously vice president- strategic planning, Chevron Corp., San Ramon, Calif.

Greg McMahan, to senior geologist, SandRidge Energy, Oklahoma City. Previously senior geologist, Chesapeake Energy, Oklahoma City.

Paul D. Newsom, to senior petroleum geologist, Heartland Oil and Gas, Stafford, Texas. Previously independent consulting geologist, Houston.

Paul Owen, to geological adviser, Hess Exploration Australia, Perth, Australia. Previously geological adviser, Kairiki Energy, Perth, Australia.

Donald Paul has retired as chief technology officer, Chevron Corp., San Ramon, Calif. Paul is currently living in San Ramon, Calif.

Valary Schulz, to consulting geologist, Dallas. Previously senior geologist, Wynn Crosby, Plano, Texas.

Frank Sheppard, to geophysicist, Newfield Rocky Mountains, Denver.

Previously geophysicist, Newfield Exploration Gulf of Mexico, Houston.

Paul Siegele, to vice president-strategic planning, Chevron Corp., San Ramon, Calif. Previously vice president-deepwater exploration/projects, Chevron Corp., San Ramon, Calif.

Gary M. Walters, to staff geologist, ConocoPhillips, Houston. Previously

senior geophysicist and operations geologist, Vanco Energy, Houston.

Chris Ward, to vice president-operations, GeoMechanics International, Houston. Previously director North and South America, GeoMechanics International, Houston.

(Editor's note: "Professional News Briefs" includes items about members' career moves and the honors they receive. To be included, please send information in the above format to Professional News Briefs, c/o AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101; or fax, 918-560-2636; or e-mail, smoore@aapg.org; or submit directly from the AAPG Web site, www.aapg.org/explorer/pnb_forms.cfm.)

McDonnell Wins GCAGS Levorsen Award

Angela McDonnell has won the A.I. Levorsen Award for the recent GCAGS meeting, presented to honor the event's best paper.

Her winning paper was "Importance of Allochthonous Salt in Texas State Waters:

Paleo-Canopy Presence and New Exploration Paradigms."

She is with the Bureau of Economic Geology in Austin, Texas. Her co-authors were Mike Hudec and Martin P.A. Jackson, both also with the BEG in Austin.

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What did he really say?

Hubbert's Curve 'Piqued' Interest

By JAMES E. WILSON

After asking a few questions of geologists of a generation or more ago, "Does the name M. King Hubbert ring a bell?" I often got the response:

"He must have been before my time."

Two or three others said, "Was he the guy who said we're running out of oil?"

King Hubbert did not say "we're running out of oil."

The media coined that phrase to create a sensational headline.

What he did say, in a paper given in 1956, was that at the then-present rate of discovery and development, current technology and the estimated ultimate, U.S. oil production would peak in the early 1970s.

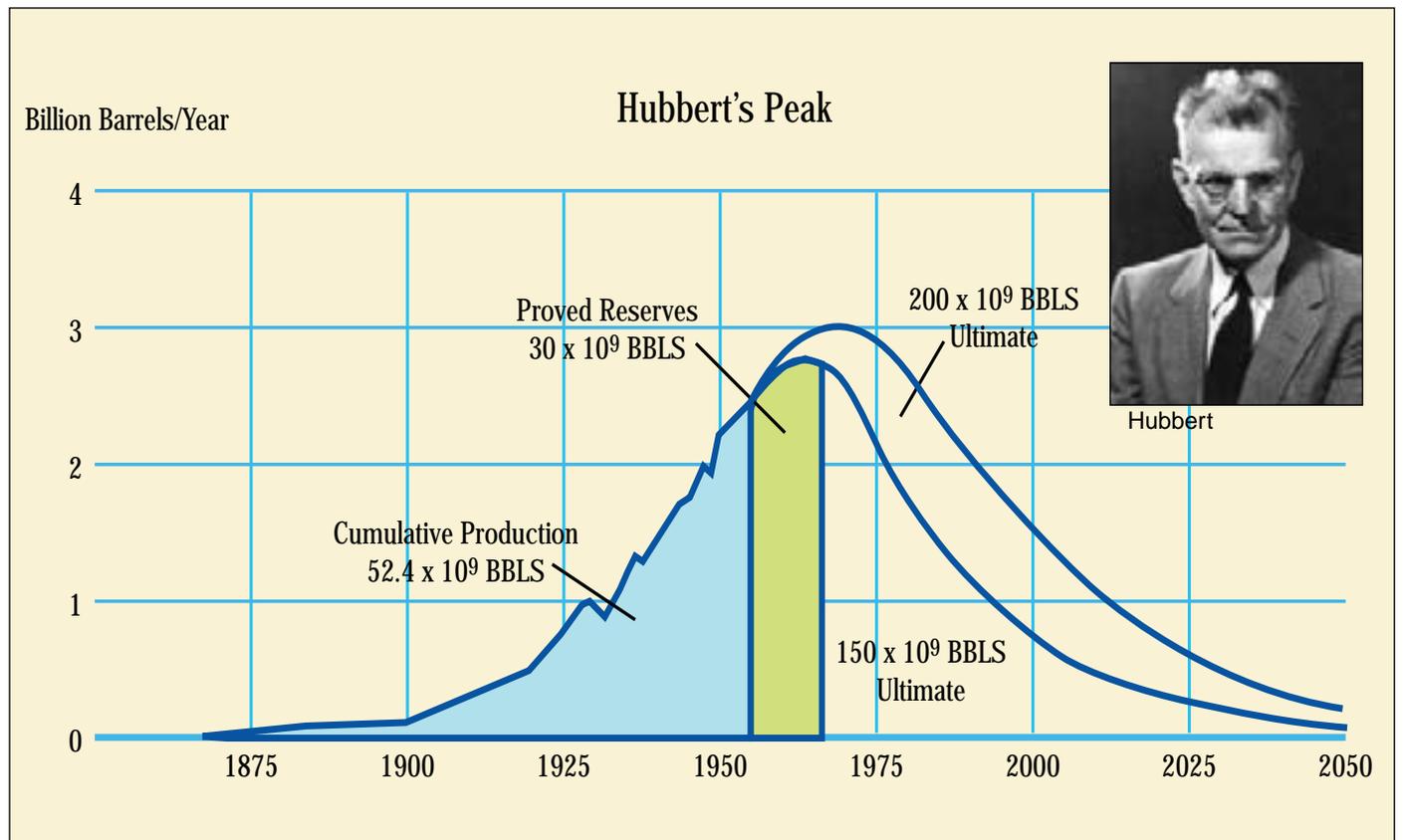
Throwing Them a Curve

In this paper, titled "Nuclear Energy and Fossil Fuels," Hubbert analyzed the status of coal, oil, gas and nuclear energy materials in the conterminous United States (politically correct term for the lower 48). He reminds us that fossil fuels exist in finite but as yet undefined quantities.

To examine the status and trend of the progress of consumption toward the ultimate of oil, he used the quasi-mathematical device known as the bell curve.

To construct a bell curve, two points are needed:

✓ An initial zero – the beginning of production.



✓ A second zero – because when the estimated volume has been consumed it would also be zero.

The bell curve serves well in dealing with commodities like oil and gas in which reserves are both added and used; the

history of the dynamics of this commodity to 1956 establishes the horizontal and vertical scale. When the half-way point between zero and the ultimate has been reached, or is projected to have been reached, volume of the commodity has

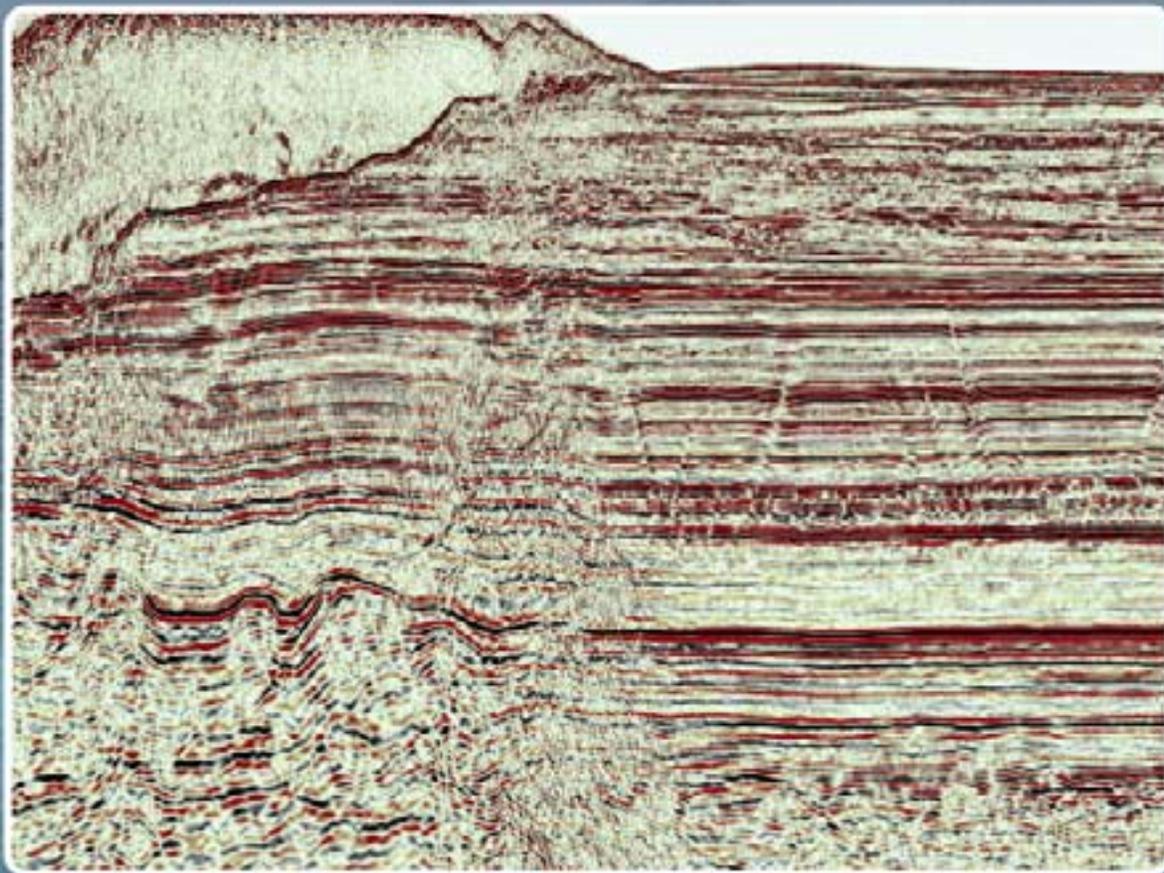
peaked (see above figure, Hubbert's bell curve).

As the process proceeds toward the

continued on next page



Gulf of Mexico: In Depth & In Focus



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ultimate (i.e. the right) downward side of the curve, it must be emphasized that Hubbert himself did not make the ultimate estimate in his graph. Rather he used estimates by Lewis G. Weeks and Wallace E. Pratt, two highly respected geologists and executives of Standard Oil of New Jersey and Humble Oil and Refining of Texas (later combined as Exxon), respectively.

Their separate estimates were very close together at about 150 billion barrels.

Hubbert, recognizing that technology of exploration and production were undergoing significant improvements, felt the estimate of 150 billion barrels was too low and arbitrarily added 50 billion barrels for an ultimate of 200 billion barrels.

The vectors toward these two ultimates are identified on the accompanying graphic. The larger ultimate extends the peaking point by about 15 years, from 1965 to the early 1970s.

What He Really Said

On Hubbert's original 1956 graph ("figure 21" in the original work), the lower dashed curve on the right gives Hubbert's estimate of U.S. oil production rates if the ultimate discoverable oil beneath the curve is 150 billion barrels. The upper dashed line, for 200 billion barrels, was his famous prediction that U.S. oil production would peak in the early 1970s. The actual U.S. oil production for 1956 through 2000 is superimposed as small circles.

Since 1985, the United States has produced slightly more oil than Hubbert's prediction, largely because of successes in Alaska (not included in estimate of 1956) and in the far offshore Gulf Coast. (Hubbert's Peak K. Deffeyes, Ch 1, p 3.)

For over 50 years additions exceeded withdrawals, and until World War II, the United States even exported oil. (It was our stopping of oil exports to Japan that triggered Japan's attack on the United States.) Hubbert's mathematical treatment of the dynamics of discovery, development and production results in a smooth curve for his figure.

Estimating an ultimate potential was a game that several credible sources played, but none had ventured or been so "rash" as to project the time of peaking. Rather than heed this warning bell and studying Hubbert's reasoning and construction, the cry went out to "kill the messenger."

Hubbert was immediately castigated in all manner of emotional criticism as an ivory tower researcher, a traitor to

exploration. Many criticized his methodology, but in the 1970s, when production of oil did peak, there were a few red faces among his loudest critics.

Hubbert did not say in these words, "We are running out of oil." What he did say was:

"... It is almost impossible to draw the production curve based upon an assumed (the then-current rate of finding and development and production technology) ultimate production of 150 billion barrels in any manner differing significantly from that shown in [his figure], according to which the curve must culminate at about 1965 and then must decline at a rate comparable to its earlier growth.

If we suppose the figure of 150 billion barrels to be 50 billion barrels too low -

See **Hubbert's Curve**, page 39

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Editor's note: James E. "Jim" Wilson was a professional colleague and personal friend of King Hubbert.

Wilson worked for about 33 years with Shell Oil, and at age 44 was named vice president for exploration in Houston - the youngest vice president in the company's history.



Wilson

Since 1973, Wilson has been an active domestic and international consultant and an award-winning author.

He is a Sidney Powers medalist, past AAPG president and holds many other AAPG Association and professional honors.



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Intellectual Battles Were King's Feast

The moving finger writes; and
having writ, moves on.

— Poems, Omar Khayyam

By JAMES E. WILSON

While fighting off critics with his left hand, King Hubbert continued research and writing with his right. The following are sketches of some of his papers before and after the bell ringing (not necessarily in chronological order).

✓ During his time at Columbia University, Hubbert worked summers for the Illinois Geological Survey, dealing primarily with ground waters. In 1940 he published a paper dealing with "The Theory of Ground-Water Motion" in *The Journal of Geology*.

Hubbert was interested in the long-held theories and laws developed in the 19th century by Henry Darcy. Hubbert replicated Darcy's original experiments, which led to the publication of this paper – which verified Darcy's work, but also included the field equations for the movement of water and other fluids through porous media.

His paper established the foundation for modern hydrology, although at the time the paper did not attract much attention, and in a few months was out of print. Ten years later it was reprinted, but wasn't widely known.

By chance in 1968, at a publishing house booth at a technical convention, a book publisher recognized Hubbert and asked him for permission to publish his paper in book form. When this paper resurfaced, it attracted the attention – and often the ire – of a new generation of scientists.

According to Hubbert memorialist David Doan, it "infuriated the hydrologists and petroleum engineers, who ceased fighting each other to turn on him. He took on all critics in published rebuttals that are themselves models of reasoning and clarity."

Hubbert gloried in intellectual combat.

✓ Later in 1940 Hubbert worked for the World War II Board of Economic Warfare in Washington, D.C.; then in 1943 he came to work for Shell as the director in the Bellaire Research Lab in Houston, and soon began contributing to operating research.

When he was working in the Illinois Basin he observed the oil-water relationships in several relatively small fields. When the ground water was static, the contact between the water, oil and gas was horizontal; but when the ground water was in motion, the contacts would slope at some angle down-dip depending on the strength of the flow.

As a consequence, some fields were slightly offset to the structural high.

Recognizing that the hydrodynamic phenomenon might offer a competitive advantage, Shell selected a number of its geologists to study this phenomenon under Hubbert's direction at the lab. The Rocky Mountain basins seemed ideal for application of this concept.

While several fields did exhibit this

situation, no new fields or extensions were discovered in that area.

However, one of the geologists selected for Hubbert's course applied these techniques to the Permian Basin, which assisted the discovery of several hundred million barrels of oil. In other areas, the studies helped to quantify the requirements for effective

When his paper resurfaced, it attracted the attention – and often the ire – of a new generation.

permeability barriers for stratigraphic traps and field development, particularly for secondary recovery projects.

Since the technique required data from wells of other sources, the technology soon became widely known. Recognizing the importance of the application, Hubbert was invited to undertake a Distinguished Lecture tour in the United States on this subject.

Later in 1967, Hubbert gave an invited paper titled "Application of Hydrodynamics to Oil Exploration" at the seventh World Petroleum Congress.

✓ In 1948 a paper by J.B. Clark, a petroleum engineer with Stanolind Oil and Gas, introduced the technique of hydraulic fracturing of selected portions of a potentially productive zone that might be improved by a stimulation process. The process would be to isolate this zone and inject a fluid such as diesel under high pressure, which would fracture the formation or widen fractures, which already existed.

"Fracking," for the most part, proved very successful, and between 1948 and 1955 over 100,000 individual treatments had been performed. Advertising by companies performing fracking services showed that the fracking was horizontal.

However, a number of petroleum engineers had questioned whether the fractures were really horizontal. To produce a bedding plane fracture meant that the entire weight of the overburden would have to be overcome.

In the fluid injection process, it was self-evident that fracturing had indeed occurred, but was it horizontal or was it vertical? Hubbert and David Willis began research on the mathematics and modeling of the fracturing phenomenon. The results of this 1956 study, "Mechanics of Hydraulic Fracturing," showed that in tectonically relaxed areas, such as the Gulf Coast, the principal stress was vertical (overburden), and the fracture would

continued on next page

continued from previous page

also be vertical. When the principal stress is horizontal from tectonic pressure, the fracturing will be horizontal, as the bedding planes will be less tightly compressed.

This new information was of great economic significance in field development and particularly in secondary recovery projects.

This required some changes in the service company's advertising brochures.

An interesting non-oil variation of this phenomenon occurred in a disposal well in Colorado.

In 1962, the northwest region of Denver experienced a series of earthquakes; at 5.3 on the Richter scale these were not seriously damaging. But they rattled a few dishes and became of concern to the public, who feared it might portend a "big one."

The Rocky Mountain Arsenal is located in the north suburbs of Denver, and during World War II had manufactured and stored nerve gas cylinders. After the war, a commercial company utilized the facilities in making pesticides. The Arsenal and the chemical company were pumping waste fluids into this 12,000-foot disposal well.

Faulting was well known along the Front Range. David Evans, an independent geologist, had heard Hubbert's lecture and read his paper on the hydraulic fracturing of rocks, and he suggested that this procedure might be activating the faults causing the earthquakes.

Recognizing this might be a possibility, the governor, acting on Evans' theory, ordered that the

pumping be stopped and requested the Colorado School of Mines to study the problem.

Expert geologists and geophysicists studied both the ground and underground conditions. Cores taken at the time of drilling showed that the well bottomed in the Precambrian. The oldest formations were of a melange of metamorphic and igneous rocks. The latest of the faulting was a north-south strike-slip fault of the Laramide Age.

Apparently the injection caused "loosening" of the welded rocks, allowing movement, which triggered the earthquakes.

The interesting phenomenon was the seismic "chatter" of minor faulting. In 1965 there were 550 small quakes, and from 1962-67 there were 1,514. After the pumping ceased, there were some residual pressure releases as the elements normalized and the quakes eventually ceased.

* * *

Throughout his professional career, King Hubbert was a prolific writer for 58 years from 1927 to 1985, producing 60 titles from the fundamental to the esoteric, including:

- ✓ 1927 – A suggestion for the simplification of fault descriptions.
- ✓ 1937 – Theory of scale models as applied to the study of geological structures.
- ✓ 1967 – Critique of the principle of uniformity.
- ✓ 1971 – Role of geology in a maturing industrial culture.
- ✓ 1974 – Statement of relations between physical growth rate, the monetary interest rate and inflation.
- ✓ 1981 – The World's evolving energy system. □

Hubbert's Curve

from page 37

an amount equal to eight East Texas oil fields – then the ultimate potential reserve would be 200 billion barrels.

The second of the two extrapolations shown in his figure is based upon this assumption; but it is interesting to note that even then the date of culmination is retarded only until about 1970.

One other contingency merits comment.

By means of present production techniques, only about a third of the oil underground is being recovered. The reserve figures cited are for oil capable of being extracted by present techniques.

However, secondary recovery techniques are gradually being improved so that ultimately a somewhat larger but still unknown fraction of the oil underground should be extracted than is now the case.

Because of the slowness of the secondary recovery process, however, it appears unlikely that any improvement that can be made within the next 10 or 15 years can have any significant effect upon the date of culmination. A more probable effect of improved recovery will be to reduce the rate of decline after the culmination with respect to the rates shown in Figure 21.

("Nuclear Energy and Fossil Fuels," 1956, pages 23-24.)

Although it is not shown on his figure, the national demand curve tracks the bell curve exactly until some time in the 1980s, when the bell curve begins to show decline in production capacity but the demand curve continues upwards at

a steady angle. The ever-widening gap between supply and demand is filled by foreign imports.

Hubbert's paper sounded the warning bell, but the government did nothing about it until about 1973, when they created the study committee chaired by Senator "Scoop" Jackson, who held open hearings on what to do about this energy "crisis."

* * *

King Hubbert lived a hearty life until his death in 1989. He expanded his thinking and studies to world problems and was called on for lectures in most of the European countries, as well as governmental and professional societies in this country.

To his American audiences he emphasized the importance of developing alternate sources of energy, particularly atomic power, and that plans should be made for a network of atomic energy plants.

Again his urging has gone unheeded.

In David Doan's memorial to Hubbert, he said, "At King Hubbert's death, there was not a geologist, hydrologist, geophysicist, petroleum engineer or mineral economist in the entire world who was not deeply in his debt." □

(Author's note: This article would not have been possible without the enthusiastic and very effective help of Mary Kay Grosvald and Karen Piquene of AAPG's Energy Resources Library.

For the article itself my loyal and longtime secretary Marguerite Bradford for her infinite patience in reading the research material and helping me compose the text itself. Charles Lujan, my personal aide, read to me a significant part of the library manuscripts.)

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Conference Shines Light on Angola

(Editor's note: Canadian geologist Tako Koning, a 30-year AAPG member, has for 12 years resided and worked in Angola, where he is a consultant for Tullow Oil. He provides this report on the recent Deepwater Offshore West Africa Exploration and Production Conference and Exhibition, held in Luanda.)

By TAKO KONING

The recent AAPG-endorsed Regional Deepwater Offshore West Africa Exploration and Production Conference and Exhibition (DOWAC), a follow-up to the first such conference held in Abuja, Nigeria, in November 2004, boasted an attendance that surpassed all expectations.

"We expected about 300 attendees, but by the time the opening day ceremonies were held well over 1,000 attendees were present," said EnergyWise managing director Gerard Kreeft, who organized DOWAC at the new Talatona Conference Centre.

The conference theme was "Learning From the Challenges of West Africa Deepwater," and attendees shared the feeling of optimism and exuberance that pervades the Angola oil industry as discoveries continue to be made – especially in the deep water – and the country's oil production continues to increase.

Angola's production in the past decade has risen from 700,000 barrels

of oil per day to the current level of almost two million barrels per day.

Beyond the oil industry, the conference atmosphere also reflected Angola's economic recovery after the 30 years of civil war that ended just five years ago. Angola is going through a post-war economic boom that has resulted in it being one of Africa's top economic performers.

The oil industry clearly has been the driver behind this recovery, which has led to a dramatic expansion of the construction industry. Continuous improvement of the roads and rehabilitation of the railroads is providing better access to the interior, which in turn allows for growth in agriculture and the mining industry.

Tourism also will benefit from the improved access, since the interior of Angola can only be described as "magnificent."

Participants and Activities

The participants included representatives from 25 countries. Africa was well represented with attendees from Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Mauritania, Mozambique, Namibia, Republic of Congo, Sao Tome and Principe and South Africa.

The unexpected high attendance figure was matched by an inundation of abstracts. The result was a technical program featuring three



Photo courtesy of Peter Moeller

Koning, leading a DOWAC field trip in Angola.

concurrent oral sessions and continuous poster sessions, offering about 100 oral presentations and 60 posters.

An innovative "Knowledge Centre," set up in the exhibits area, provided a chance for five Angolan universities to showcase their geologic programs to companies attending the meeting. The display was sponsored by Angola Santa Fe, the ING Bank, Marathon Oil



and Schlumberger, and all the universities received contributions from DOWAC in support of their programs.

A geological field trip also was part of DOWAC, as Sonangol's Mario Brandao and this author led about 25 geoscientists and engineers on a one-day trip to the Caxito area north of Luanda – a geologically fascinating area due to the extensive oil seeps that are found near the outcrop edge of Precambrian basement.

The trip also provided the attendees with the opportunity to study some of the sedimentary formations that are productive in Angola's offshore area.

The Angola DOWAC was sponsored by many of the leading players in the Angola offshore region including Sonangol, BP, Chevron, ExxonMobil, Halliburton, Schlumberger and Total.

In addition to AAPG, DOWAC also received the endorsement of SPE and SEG. □

(Editor's note: A report on Koning's humanitarian involvement with Angola's water well initiative will be included in the February EXPLORER.)

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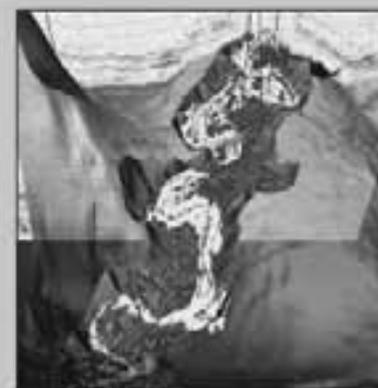
THE PETROLEUM GROUP OF THE GEOLOGICAL SOCIETY IS HAPPY TO ANNOUNCE THAT REGISTRATION FOR THE FOLLOWING CONFERENCES IS NOW OPEN:

RESERVOIR COMPARTMENTALIZATION

5th – 6th March 2008, The Geological Society, Burlington House, London

This 2-day international conference will examine approaches to recognition, characterisation and prediction of geological controls on Reservoir Compartmentalization - through integration of geoscience and reservoir engineering studies (structure, geomechanics, geophysics, stratigraphy, sedimentology, diagenesis, fluids and pressures). Contributions from industry and academic researchers, specialist service providers, and practitioners - will provide a collective benchmark of the modern science and related technology applied to Reservoir Compartmentalization.

Please visit <http://www.geolsoc.org.uk/gsl/groups/specialist/petroleum/page746.html> for more information.



FOLD-THRUST BELT EXPLORATION: THE NEXT TECHNICAL FRONTIER

14th – 15th May 2008, The Geological Society, Burlington House, London

This conference will examine key themes and issues relating to fold-thrust belts worldwide, from outcrop studies through to hydrocarbon exploration and production. The conference will cover the different thrust systems, and focus on structural concepts, models and techniques, thermal regimes, petroleum systems, current methods of thrust belt interpretation and exploration, and specific oil & gas field case studies. The conference is being run in association with the Tectonic Studies Group (TSG)

Please visit <http://www.geolsoc.org.uk/gsl/groups/specialist/petroleum/page747.html> for more information.

For further information or to register for these conferences please contact
Kerri Deegan, Event Coordinator, The Geological Society, Tel: +44 (0)20 7434 9944.
 Fax: +44 (0)20 7494 0579 or email: kerri.deegan@geolsoc.org.uk.



First announcement and call for papers.

RIFTS RENAISSANCE: STRETCHING THE CRUST AND EXTENDING EXPLORATION FRONTIERS

19th - 21st August 2008, Museum of Natural Sciences IMAX Theater, Houston, Texas USA

Following on from the highly successful Return to Rifts conference hosted by the Geological Society of London in April 2005, the conference entitled "Rift renaissance – stretching the crust and extending exploration frontiers" seeks to challenge the validity of current rift model paradigms. The conference convenors welcome abstracts that address the following suggested themes:

- New data that challenge current rift dogma
- Uncharacteristic features of rift basins from empirical observations or models
- Accreted continental terrains and pre-existing tectonic fabric – the roll of crust conditioning
- Continuous versus episodic rifting how do we stretch the crust and how does it deform?
- Continental oceanic transitions – what do we observe?
- What happens when we rift to drift? – break-up sequences and transitions?
- Exploring rifts – the petroleum systems, plays and the future potential
- Comparative rift provinces – does size matter?
- Numerical modeling of lithosphere extension – exploration implications
- Extensional systems and syn-tectonic facies – can we be more predictive?
- What's wrong with the North Atlantic?
- Pre-drift inversion – fact or fiction, understanding stress evolution?

Please submit abstracts of 500 words or less to Kerri Deegan at the Geological Society of London kerri.deegan@geolsoc.org.uk by 30th April 2008.



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www.geolsoc.org.uk/petroleum

International showcase expanding

Impact of IP Shown in Results

By LARRY NATION

AAPG Communications Director

It was 13 years ago at the AAPG Annual Convention in Denver that the International Pavilion (IP) made its debut with 37 countries promoting exploration and investment opportunities.

The 1994 premiere was at first thought to be a one-time event. However the showcase attracted representatives from countries as diverse as Indonesia and Venezuela, which had extensive oil and gas operations, as well as exploration-wise obscure countries such as Equatorial Guinea and Belize.

The enthusiasm for the IP called for



an encore the next year – and a *redux* after that.

The International Pavilion is now a staple at the AAPG annual conventions and has expanded its presence to the AAPG international conferences.

At first managed by AAPG volunteers and led by the IHS Energy's forebear Petroconsultants, the IP has evolved into a wholly owned, for-profit subsidiary of the Association, with Gina Godfrey of PetroWeb as lead administrator.

Godfrey's interest in the IP stems from her belief from the beginning that "the IP is a fantastic vehicle for anyone interested in getting involved internationally."

Results have shown its effectiveness.

Ronald Equisquiza, marketing manager for Perupetro, the Peruvian government agency in charge of promoting and signing contracts, noted that since its involvement in 2004 the IP has "contributed to impressive results for his company."

"At the end of 2003, Perupetro had 27 E&P contracts," Equisquiza said. "Now, at the end of 2007, Perupetro has 84 contracts – 65 of them in exploration and 19 in exploitation phase."

"We believe our participation in the IP program has contributed significantly to this success," he said.

On the other side of the business equation are the sponsors, who through the IP stand to gain new customers.

TGS-NOPEC has been a corporate sponsor for the past several years.

"Through the IP we enhance our ability to cultivate and maintain relationships with high level contacts within NOCs and ministries to further our mutual business interests," said company president Pierre Benichou.

Results – And What's Next?

With the IP's inauguration as a real-live company, opportunities to expand are being tapped. Godfrey said, making the IP a year-round player for promotion of international petroleum investment opportunities – including APPEX London.

Also, a recent partnering with the American Association of Petroleum Landmen will result in the IP exhibition at the 2008 NAPE in Houston.

Additionally, there is access to year-round marketing not only through the exhibitions but the online Web site, featuring an interactive map with news and data.

With all the marketing, the bottom line is still results.

Remember those "exploration-wise obscure countries" at the 1994 IP?

Consider:

✓ Equatorial Guinea's economy has grown dramatically since the country began producing oil in 1995 and is now the third largest oil producer in Sub-Saharan Africa, according to the U.S. Energy Information Agency. Also, Equatorial Guinea's natural gas production continues to increase.

✓ Belize is now an oil producer (August 2006 EXPLORER). Interestingly, one of the players in the Belize oil discovery was Susan Morrice, one of the IP's leaders at its premiere.

"The IP is a fantastic first step for information and contacts," Godfrey said. Equatorial Guinea and Belize might agree. □

THANK YOU

A special thanks to all the sponsors who helped make this AAPG and AAPG European Region Energy Conference and Exhibition possible



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WWUpdate

All Browsers Are Not Created Equal

By JANET BRISTER
Web Site Editor

We painted our living room the other day.

It's lovely – so we had some friends over to enjoy it with us and, sure enough, one of them politely pointed out, "you missed a spot."

Aaaarrgh!

That ever happen to you?

Well, it's never happened to me, either – but it does in my job on a regular basis.

As the AAPG Web site editor I design a series of pages. Get the

column widths just right. Have the text colors arranged to our liking. Make sure the ratio of text fonts to headers are perfectly aligned – and we check it in our browser of choice.

It's beautiful! It's all set.

Then the spot-checks begin.

By that I mean I begin looking at the design in other browsers besides my personal favorite.

I make a point to look at a minimum of three browsers: Internet Explorer, Firefox and Safari. Occasionally I look at a different browser, but I look for flexibility and ease of use.

Sometimes, the difference "ain't pretty" and it's back to the drawing board – but once I feel good about it I upload the page(s) ... then, I get the fated phone call "you missed a spot!" Aaaarrgh! (again)

What's Your Browser?

According to the W3Schools Web site, there are seven browsers of choice for which Web developers need to be concerned about. Are one of these yours?

✓ Internet Explorer (IE).

✓ Firefox (identified as Mozilla before 2005).

✓ The Mozilla Suite (Gecko, Netscape).

✓ Safari (and Konqueror. Both identified as Mozilla before 2007).

✓ Opera.

✓ Netscape (identified as Mozilla after 2006).

✓ America Online (based on both IE and Mozilla).

Find it? OK. What version?

And – importantly – when did you last update?

Because your answers to these questions will tell me why you might call to say "you missed a spot!"

Not all browsers, computers or operating systems are created equal. As pages are developed we try to hit the common denominator.

That being said, the W3Schools watches IE7, IE6 and IE5 in addition to Firefox, Mozilla, Safari and Opera. (They do this because these seven browsers are each used by at least 1 percent of the Web-accessing community.)

Internet Explorer is still the most common browser used when you lump versions 7, 6 and 5 together. But when broken out separately, it turns out that Firefox is gaining ground. In fact, over the past six months it has tipped the scale and been the most used browser over IE6, with IE7 in third place.

When you compare screen shots of the same Web page generated with different browsers you see that perfection in a Web page does not come through its appearance but its flexibility and ease of access while working within the parameters of every users' browser of choice.

Did I Just Say That?!?

I used the "p" word – perfection. Let me re-state ...

Good Web pages are flexible. They display their content fast and easy without a lot of bells and whistles so the communication is clear and the message is concise.

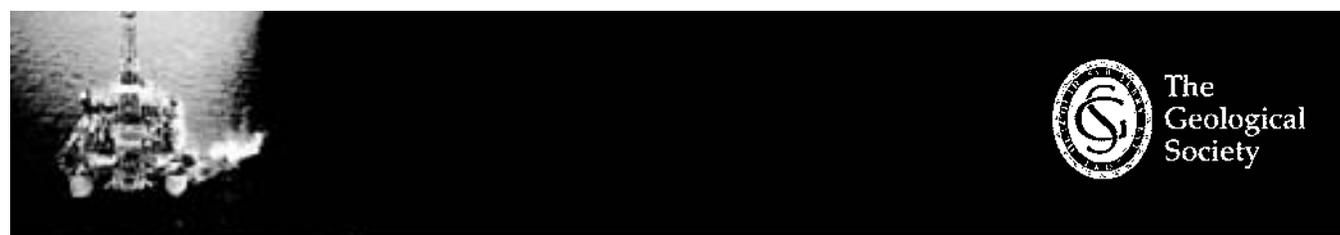
But to see the intended appearance and receive the clearest communication, you may want to consider updating your browser, changing your browser or getting a new monitor or something.

You see, Firefox (aka Mozilla) is gaining ground because developers of Web sites are finding that what they design displays correctly within the Firefox environment. When we are spot-checking our pages in Opera, any of the IEs or other less-favorite browsers, we find many discrepancies due to ignored code or lack of compliance with industry standards.

When a browser refuses to "play well with others," people start to move on. Thus the switch. Plus, since all Web browsers are free for download, why not give it a shot?

I have about four browsers loaded on my computer so I can maximize my options in viewing the Web pages I surf.

Try it; you might like it – and discover that we haven't missed that many spots after all. Good browsing! □



Geological Society of London Conference and Events Programme

28 January 2008	Maximising the Remaining Potential of the Central North Sea	Burlington House
20 February 2008	Lyell Meeting	Burlington House
5-6 March 2008	Reservoir Compartmentalization	Burlington House
27 March 2008	19th Petroleum Group Annual Dinner	Natural History Museum
14-16 May 2008	Fold-Thrust Belt Exploration	Burlington House
19-21 August 2008	Rifts Renaissance	Museum of Natural Sciences, IMAX Theatre, Houston, Texas, USA
16-18 September 2008	Fault Damage Zones	Burlington House
21-22 October 2008	Subsurface Sediment Mobilisation	Burlington House
6-7 November 2008	Rivers, Estuaries, Deltas & Beaches: Traps for Fossil Fuels	Burlington House

For sponsorship opportunities, to submit an abstract, to register or for further information on any of the events listed please contact:

Kerri Deegan, The Conference Office, Geological Society of London. Tel: 020 7434 9944 Fax: 020 7494 0579

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SHORT COURSES



Decision Methods And LNG Value Chain Management

March 1 – 2, 2008

Manama, Bahrain, in conjunction with GEO-2008 Meeting

William Haskett & Deborah Resley, Decision Strategies Inc., Houston, TX

(Note: Registration handled thru GEO-Bahrain website, NOT AAPG.)

Go to <http://www.geobahrain.org/> for complete meeting and registration information)



Basic Petroleum Geology for the Non-Geologist

A joint course with AAPG and The University of Tulsa Continuing Engineering and Science Education Department

March 25-27; April 15-17, 2008

Oklahoma City, OK (March); Houston, TX (April)

Norman Hyne, The University of Tulsa, Tulsa, OK

<http://www.aapg.org/education/shortcourse/details.cfm?ID=26>



Principles of Reservoir Characterization

April 7-8, 2008

Houston, TX

Jeffrey Yarus, Landmark Graphics Corp., Houston, TX

<http://www.aapg.org/education/shortcourse/details.cfm?ID=105>



Risk Analysis and Decision-Making in E & P:

From Evaluating Plays and Prospects To Efficient Appraisal and Development

April 19-20, 2008

San Antonio, TX, with AAPG Annual Meeting

P. Jeffrey Brown, Decision Strategies, Inc., Oak Ridge, TN; Patrick Leach, Decision Strategies Inc., Missouri City, TX

<http://www.aapg.org/education/shortcourse/details.cfm?ID=68>

FIELD SEMINARS



Deepwater Clastic Deposits

March 17-21, 2008

Begins and ends in Little Rock, AR

Roger M. Slatt, Director, Institute of Reservoir Characterization, University of Oklahoma, Norman, OK; Charles G. Stone, Arkansas Geological Commission (ret.), Little Rock AR; Robert Davis, Schlumberger Oilfield Services, Oklahoma City, OK

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=10>



Deep-Water Siliciclastic Reservoirs, California

April 13-18, 2008

Begins in Palo Alto and ends at the airport in San Francisco, California

Stephan Graham and Donald R. Lowe, Stanford University, Stanford, CA

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=17>

Clastic Reservoir Facies and Sequence Stratigraphic Analysis of Alluvial Plain, Shoreface, Deltaic, and Shelf Depositional Systems

April 2008. Check website for latest scheduling details.

Begins and ends in Salt Lake City, Utah

Thomas A. Ryer, The ARIES Group, LLC, Katy, TX

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=9>



For more info or to enroll call +1 918 560-2650 or visit <http://www.aapg.org/education/>

More science than you can shake a pick at.

REGIONS&sections

Aberdeen Team Offers Winning Tips

(Editor's note: *Regions and Sections* is a regular column in the *EXPLORER* offering news for and about AAPG's six international Regions and six domestic Sections.

Contact: Carol McGowen, AAPG's Regions and Sections manager, at 1-918-560-9403; or e-mail to cmcgowen@aapg.org.)

By CAROL MCGOWEN
Regions and Sections Manager

Applications have been received from over 30 universities in AAPG Sections and Regions around the globe for this year's Imperial Barrel Award program.

Data sets will be sent to participating universities in early January, allowing student teams eight-to-10 weeks to analyze the data and prepare for their local IBA competitions.

Each Section and Region will hold its local competition in March, and the first place team from each Section and Region competition will advance to the global competition, to be held in San Antonio during April's AAPG Annual Convention.

The stakes are high for the global competition, with the winning first, second and third place teams vying for large cash prizes to benefit their geoscience departments and trophies for the winning students.

Just what does it take to win the Imperial Barrel Award competition?

Students from the University of Aberdeen, last year's IBA winning team, offered some tips for the 2008 contestants:

European Election Results Announced

New officers for the European Region have been announced. They are:

- ☐ President-elect – **David Cook**, ExxonMobil (retired), UK (through 2010).
- ☐ Advisory Council – **Stuart Harker**, PGS Reservoir, Scotland, (2005-08,

plus one year additional term through 2009).

- ☐ HoD – **Peter Burri**, independent, Switzerland (through 2010).
- ☐ HoD – **Wolfgang Nachtmann**, Rohoel-Aufschungs AG, Austria (through 2010).

- ✓ Go the IBA Web site at www.aapg.org/iba to get an idea of what is expected from the group. View the "Introduction to Imperial Barrel Award" slides.

- ✓ Teams are provided with a sample judging form – so think about what the judges are seeking. Work out your objectives.

- ✓ Ensure you know what software you will be using and how to use it.

- ✓ Check all the data before you start.

- ✓ Select a project manager (who may not be the obvious leader). While they should be just as involved in the technical work as everyone else, the PM's main function is to keep the group on a schedule and to recognize where group members may be going into excessive detail. The whole group should be involved in creating the time schedule, but it will be the PM who ensures it is enforced.

- Don't try to manage as a group – it does not work.

- ✓ Plan your workflow and set mini-

deadlines – and set them much sooner than they need to be. Aim to finish your presentation at least a week before the competition.

- ✓ Distribute the workload evenly and give each person a different specialty, i.e. seismic, petrophysics, etc.

- ✓ Make sure everyone is aware of what others in the group are working on, so there is no overlap and you know who to go to with questions.

- ✓ Don't spend too long on the literature search and regional background. Key events and knowledge of potential play components should be sufficient.

- ✓ Do the easy stuff early, i.e., slide layout.

- ✓ Know when you have done enough and concentrate on making what you have done better rather than trying to do extras that you will not have time to finish.

- ✓ Prepare for potential questions.
- ✓ Your image should not detract from the presentation. This is a business dress code event (wear a suit). If possible,

bring more than one business-dress outfit (the Aberdeen group said they were unprepared for the subsequent business functions that arose during the AAPG conference).

- ✓ Don't try to do too much in the presentation, i.e. don't try to explain the 15 prospects you found; focus on the biggest/most interesting/innovative prospect.

- ✓ Don't overlook the handout. It may be what differentiates you from another team.

The IBA instruction packet requires two deliverables: a 25-minute presentation and a double-sided A4 handout. It is easy to concentrate primarily on the presentation, but judges were influenced mostly by the information Aberdeen had chosen to include in the handout.

- ✓ Keep backups of EVERYTHING!

- ✓ Be prepared for internal team arguments. Try to stay calm.

- ✓ Present a part of the presentation that you did not work on – this will help you stick to the five-minute time limit, as your knowledge will be limited to what is important.

- ✓ The most important thing is time management! Aberdeen's last few weeks involved very few hours of sleep and absolutely zero social life.

- So don't put things off, just get things done and move on.

- ✓ Finally: **Practice! Practice! Practice!** Do not try to wing it.

Good luck!

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Great Field Trips –

Petroleum History of the Western
San Joaquin Valley

Coastal Exposures of Miocene
Monterey Formation

Wine and Geology of the Paso
Robles Area

Great Talks –

Thermal Diatomite Projects

Fractured Shale Production

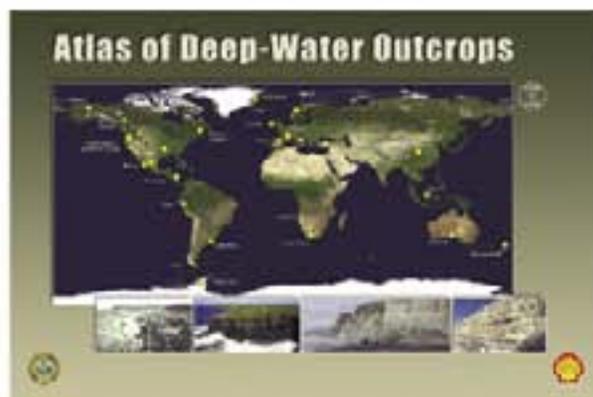
Super Giant Kern River Field is
the 3rd California Field to hit 2
Billion Barrels in Cumulative
Production

Great Times –

Exhibits, Oral and Poster
Presentations, Panel
Discussions, Socializing and
Networking

Welcome, AAPG's Newest Titles.

Join us in celebrating the arrival of the AAPG's newest book and CD-ROM. We are tremendously grateful to our authors and editors for their tireless dedication to producing such fine publications. We are confident you will find them applicable, timely and relevant to your career and objectives. For more details on all products offered by the AAPG visit <http://bookstore.aapg.org/>



**AAPG Studies 56:
Atlas of Deep-Water Outcrops**

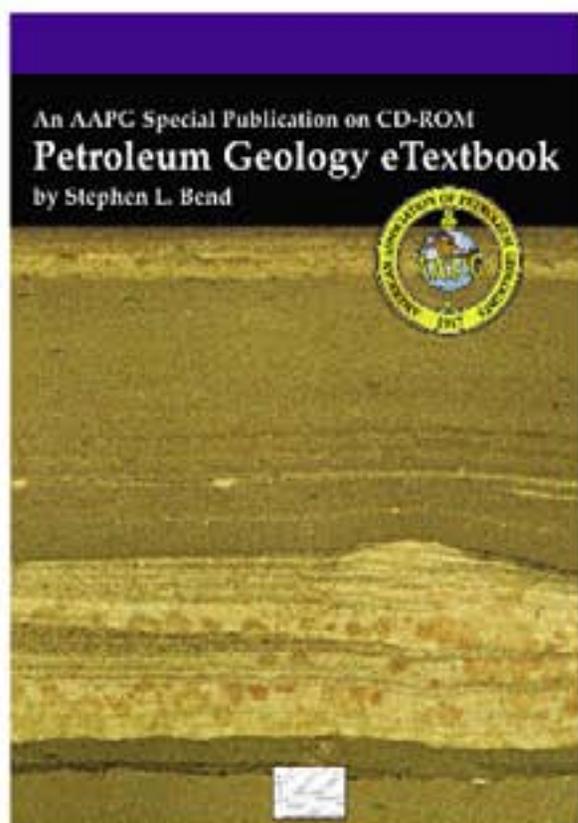
Members: \$189
Non-members: \$239

This Atlas assembles the first collection of quantitative architectural data on deep-water outcrops geared for ease of use in reservoir characterization and modeling. It contains 154 papers, and is a collection of both qualitative and quantitative data on deep-water outcrops from around the world that includes all seven continents and 21 countries.

The Atlas is comprised of a hardcopy and CD-ROM. The hardcopy contains papers with summary information, illustrations, and quantitative data on 103 outcrops. It also contains overview papers on selected topics that summarize the types of deep-water deposits, seismic modeling of outcrops, current outcrop study techniques, and use of outcrop data in reservoir modeling.

The companion CD-ROM includes 38 journal-style articles on the overview papers from the hardcopy and more detailed reviews of selected outcrops.

The goal of this publication is to not repeat but to build on previous work on deep-water fields and reservoirs, outcrops, and on modern submarine analogs. By providing new and consistent data that more fully describe the various architectures present in deep-water outcrops, this Atlas provides important information for developing models and for comparing various depositional settings.



**Discovery Series 11:
Petroleum Geology eTextbook**

Members: \$46
Non-members: \$46

"I am excited that, perhaps for the first time, an introductory text is able to combine the traditional look of a textbook with both multimedia and interlinked material. Especially because this electronic textbook, or eTextbook, not only provides the reader with a useful list of references, but also includes a small interlinked 'library' of previously published journal articles, book chapters, and contributions by professionals in the industry.

This compilation includes well known journal papers, selected chapters from AAPG Memoirs, and technical contributions by professional geoscientists. All represent excellent supplements to the body of the eTextbook and provide additional information for those seeking to learn more. I also am delighted that this eTextbook contains many of the petrophysical logging charts that are so frequently used by the professional geologist and, to demonstrate the utility of such charts and diagrams, I include a few worked examples.

I believe the included video clips both provide insight by specialists in their respective fields of expertise, and aid the learning process through the animation of a technique or phenomenon. Whereas the expression, "A picture tells a thousand words," remains true, so today a video clip (which is nothing more than a stream of moving pictures) can sometimes be even more effective.

Therefore, this eTextbook breaks new ground and I believe takes the textbook to a new level. I find this exciting, and I hope newcomers will find the material equally exciting, challenging, and interesting.

Certainly the industry has all of this."

... Adapted from Stephen Bend's Preface



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More science than you can shake a pick at.

FOUNDATIONupdate

Individual contributions to the AAPG Foundation topped \$1,622,470 in 2007.

Foundation officials, in expressing thanks to the thousands of AAPG members who donated money over the past year, noted much gratitude especially for members of the AAPG Foundation Trustee Associates, which accounted for 79 percent of the year's donations.

The Trustee Associates was formed in 1967 with the mission to provide a source of funding to support educational, charitable and scientific objectives that directly and indirectly benefit the geologic profession and general public.

* * *

Foundation Trustee Chairman Bill

Fisher recently announced that funding totaling \$196,000 was approved at the Board's recent meeting in Tulsa.

Included in that total:

✓ A grant to AAPG DataPages totaling \$146,100 will be used to fast-track additional geological collections and GIS projects.

✓ The American Geological Institute (AGI) will receive \$25,000 in additional funding for its Earth Science Week Program.

✓ The University of Colorado's Interactive Geology Project will receive a \$25,000 grant.

* * *

Contributions toward the creation of two new grants-in-aid funds have been received recently by the Foundation.



Fritz



Eleanor and Allan Martini

✓ Foundation and AAPG Executive Director Rick Fritz has provided funding to establish a memorial grant-in-aid to honor his parents, Charles B. and Marilyn C. Fritz, to be used by an Oklahoma State University student.

✓ Trustee Associate Allan Martini and his wife, Eleanor, have provided funding

for the new Allan and Eleanor Martini Named Grant-in-Aid, which will provide an annual \$1,000 grant to a geoscience graduate student whose thesis research has application to the search for and development of petroleum and energy-mineral resources.

By defraying the increasingly high costs of fieldwork and lab analysis, the Grants-in-Aid Program provides support to deserving students to further their research.

To learn more about establishing Named Grants through the Grants-in-Aid Program, contact Rebecca Griffin, 918-560-2644, or visit the Foundation Web site at <http://foundation.aapg.org/gia/index.cfm>. □



Foundation (General)

Keith Robert Adamson
Nasser Mohammad Al Ghamdi II
Rui Jorge F. Baptista
Robert D. Cowdery
In memory of Daniel Busch
Edward K. David
In memory of Thomas Mairs
Rudolf Stefan C. De Ruyter
Wallace De Witt Jr.
Philippe Demeur
Robert W. Esser
Peter Gordon Gray

Bill Deward Holland
*In memory of Kay Pettway,
Jerry Cooper and Flo Jane
Cloud*

Harold Eugene Kellogg
Donald Watson Lewis
In memory of Thomas Mairs
John Harris Marshall Jr.
Patric R. McConn
Leslie Owen Niemi
Harry Ptasynski
*In memory of John Traut
and Fred Meissner*

Michael S. Shearn
Brian James Stambaugh
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Tunde U.N. Sule
Charles Bowen Wheeler

Awards Fund

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Outstanding Research Award*
Willard R. Green

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Digital Products Fund

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**William E. and Jean Crain
Named Grant**
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**Ike Crumbly
Minorities in Energy Grant**
Robert Loren Countryman
In honor of Ike Crumbly

**Herbert G. Davis and Shirley A.
Davis Named Grant**

Herbert G. Davis
*In memory of Wilbur
McMurtry
and Daniel Busch*

**Norman H. Foster
Memorial Grant**
John R. Todd II

**Charles B. and Marilyn C. Fritz
Memorial Grant**

Lee Travis Billingsley
In memory of Marilyn Fritz
William E. Gipson
In memory of Marilyn Fritz

David E. Lange
In memory of Marilyn Fritz

**Allan and Eleanor Martini
Named Grant**
Allan V. Martini

**Donald A. and Mary O'Nesky
Named Grant**

Donald A. O'Nesky
*In memory of Thomas Mairs
and Daniel Busch*

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2008 AAPG ANNUAL CONVENTION & EXHIBITION
DELIVER THE CONVENTIONAL;
PURSUE THE UNCONVENTIONAL
APRIL 20-23

MEMBERSHIP & certification

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

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

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

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

For Active Membership

California

Mellors, Robert John, San Diego State University, San Diego (G.H. Girty, J.G. Kuespert, L.T. Billingsley); Owen, Kirk Edward, Aera Energy, Bakersfield (K.L. Pitts, M.E. Allan, E.M. McKay)

Colorado

Loken, David M., Mak J Energy, Littleton (T.T. Schowalter, R.T. Larson, M.S. Caldwell); Pruit, John D., J.D. Pruit Corp., Denver (reinstatement)

Kansas

DeBoer, Daniel Alan, Abengoa Bioenergy, Wichita (reinstatement)

Kentucky

Shields, Randy, self-employed, Bowling Green (G.W. Cumbee, J.L. Islas, T.W. Cate)

Massachusetts

Zhang, Tuanfeng, Schlumberger-Doll Research, Cambridge (N.F. Hurley, D. McCormick, C. Signer)

Mississippi

Tarbutton, Ronald J., Mississippi Oil and Gas Board, Brandon (reinstatement)

Pennsylvania

Fontaine, James Steven Jr., Universal Well Services, Meadville (J.P. Fagan Jr., D.A. Billman, E.S. Billingsley); Ober, Eric G., Texas Keystone, Pittsburgh (G.R. Wrightstone, J.M. Taylor, D.A. Billman)

Texas

De Man, Ellen Maryan, ExxonMobil, Spring (S. Van Simaey, M.L. Sweet, J.W. Snedden); Howell, John D., self-employed, Hughes Springs (reinstatement); Jones, U.V. III, consultant, Midland (D.P. Osborne, M. Elliott, L.J. Rulla); Murley, William Hugh, Murley & Standhardt Consulting, Stanton (reinstatement); Odunsi, Adedokun Adetayo, Chevron Nigeria, Sugar Land (A. Adedayo, O.

Valentine, R.W. Crown); Romig, Theodore U., Noble Energy, Houston (reinstatement); Wegner, MaryBeth, Humble Geochemical Services, Houston (R.D. Fritz, S.K. Bhattacharyya, H.M.C. Danielli); Wopara, Gilbert O., ENI Petroleum, Houston (E.A. Watkins, S.A. Stanley, F.M. Budhijanto)

Australia

Amos, Kathryn Jane, University of Adelaide, Adelaide (C. Krapf, B. Ainsworth, J. Kaldi); Chambers, Kurt J., Santos, Adelaide (M.R. Densley, S.A. Spagnuolo, D. Beckett); Langhi, Laurent, CSIRO Petroleum, Perth (M. Keep, D.N. Dewhurst, J. Underschultz); Vakarelov, Boyan Krustev, University of Adelaide, Adelaide (R.B. Ainsworth, J. Bhattacharyya, T. Payenberg)

Canada

Fothergill, Patrick Allen, Schlumberger, Calgary (B. Davis, M. Lamb, S. Hansen); Zhang, Xingquan Kevin, Roxar AS, Calgary (R. Chelak, A.C. MacDonald, K.S. Hoffman)

England

Bhattacharyya, Sumon Kumar, Fugro-Jason UK

Ltd., Wallingford (R.D. Fritz, M. Wegner, H.M.C. Danielli)

Germany

Port, Guido J., IES GmbH, Aachen (D. Palmowski, D. Welte, K.E. Peters); Wygrala, Bjoern Peter, IES, Aachen (D. Welte, B. Horsfield, P.K. Mukhopadhyay)

Indonesia

Pal, Aditi, Schlumberger, Jakarta (G. Gillis, R.E. Netherwood, M. Donselaar)

Korea

Choi, Kyungsik, Chonnam National University, Gwangju (S. Park, T. Lee, S.S. Chun); Kim, Dongwon, STX Energy, Seoul (J. Pigott, J. Forgotson, P.R. Philp)

Malaysia

Lee, Heng Poh, Sarawak Shell Berhad, Miri (J.E. Laing, M. Lechner, M. Wiemer)

Netherlands

Korevaar, Aernout, Shell International E&P, Rijswijk (J. Karlo, S. Meyer, P. Spaak)

Norway

Hansen, Martin Bak, Hydro Oil & Energy, Bergen (O.J. Martinsen, B. Badics, J. Korstgard)

Pakistan

Rahman, Attique ur, OMV Pakistan, Islamabad (M. Zaman, N. Ahmad, B. Krainer); Shah, Syed Haider Ali, Oil and Gas Development, Islamabad (T. Jaswal, A.Q. Khan, R. Ahmed)

People's Republic of China

Ng, Kwok Hei, Hanki Contractors (HK) & Associates, Hong Kong (C. Jia, H. Darman, F. Zixin)

South Africa

Wickens, Henry De Villiers, University of Stellenbosch, Stellenbosch (J.B. Aldrich, D.S. Broad, M. Wood)

Thailand

Ampaiwan, Tianpan, PTT Exploration and Production, Ckatuchak (S. Praditnan, R.C. Shoup, S. Kaewla-iad) □

ABSTRACT DEADLINE:
JANUARY 18, 2008



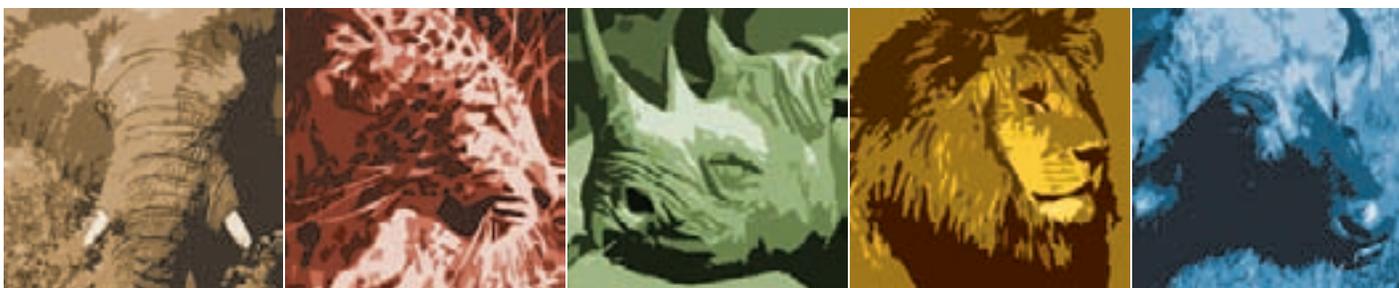
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You are invited to submit your abstract for the AAPG International Conference and Exhibition in Cape Town.



The Technical Program Committee welcomes abstracts submitted to any of these **BIG FIVE** themes.

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



AAPG will gladly accept your abstract up to January 18, 2008.

Visit www.aapg.org/capetown for abstract guidelines and submittal and conference information.

Certification

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

Petroleum Geologist

Texas

Herdklotz, Hal T., Swift Energy, Houston (reinstatement)

France

Helm, John Anthony, BP Angola, Hoerdt (Geological Society of London)

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*Three levels of dues***Statements Reflect New Dues Regime**

By VICKI BEIGHLE
AAPG Membership Manager

The graduated dues program, approved by the House of Delegates at the Long Beach meeting last year, is getting close to reality for all AAPG members.

AAPG began offering new applicants the opportunity to join, utilizing the graduated dues program last July but effective this billing cycle existing members will fall under the program's guidelines.

This means *major* changes to the next dues statement you will receive.

The graduated dues program affords three levels of dues, all based on individual members' annual personal gross income (PGI). Dues will **no longer** be based upon type of membership (excluding Student and Emeritus members).

Also, there are more options available for publications for those members who qualify.

Members' Responsibilities

The changes in the graduated dues program necessitates several important modifications to the dues statement, and

requires each member to carefully review and complete the information on the dues statement to ensure proper level and calculation of the amount of dues owed for the year.

For example, one important step for the members who are eligible for Level 2 or 3 dues is to be certain the total remittance line is filled in properly. The total dues will be based on the basic dues amount, AAPG Foundation contributions, publication options selected and Division dues.

All Active and Associate members will be billed at the maximum rate (\$80). Any

member electing to utilize lower dues will be required to indicate the appropriate level on the form and write their initials as confirmation.

Electronic signature will be required for online payments.

AAPG's graduated dues structure was designed to enable and encourage geoscientists worldwide to join the Association, regardless of economic limitations.

Delivery methods for monthly publications are tied to the level selected.

Members will continue to receive full benefits – including voting privileges for Active members – regardless of the dues level that is selected.

AAPG does not require proof of income or any member's PGI; this is an honor-based program, defined by AAPG standards of professional conduct.

Program Details

Details of the graduated dues program include:

✓ Level 1 dues – \$80 for North America, \$90 if outside North America (annual income greater than \$50,000). Members can receive the BULLETIN either online with a CD, or in print, and the EXPLORER in print.

✓ Level 2 dues – \$40 for North America, \$50 if outside North America (annual income greater than \$25,000, but less than \$50,000). Members receive the BULLETIN online only, plus the EXPLORER in print.

✓ Level 3 dues – \$20 (annual income less than \$25,000). Members have access to the online versions of the BULLETIN and EXPLORER.

All annual income amounts are based on and equivalent to U.S. dollars.

All members (applicants) with addresses outside North American who select Levels 1 or 2 must pay the additional \$10 mail surcharge to receive the print editions of the BULLETIN and EXPLORER.

Levels 2 and 3 may purchase print copies of BULLETIN and EXPLORER for additional annual added fee(s).

Members wishing to contribute to the Foundation via their dues statement also will have greater choice and flexibility regarding distribution of their gifts (select funds will be listed on the back of the statement).

Complete details are available at the AAPG Web site at www.aapg.org.

* * *

Members also can now indicate their preferred billing address for various items from AAPG.

For example, you can choose to receive mail (and publications such as the EXPLORER) at your home address and other items, like your dues statement, at your office.

Your preferences can be entered online via the Members Only area of the AAPG Web site. □

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*Commissioners Disability Table 2003 ©



DPA, EMD Announce Officer Candidates

Officer nominees for the Division of Professional Affairs and the Energy Minerals Division for 2008-09 have been announced. They are:



and Utilities Board, Calgary, Canada.

Vice President

☐ Maria Mastalerz, Indiana Geological Survey, Bloomington, Ind.

☐ Andrea A. Reynolds, Shell International Exploration and Production, Houston.

Secretary

☐ Amy E. Sullivan, Shell International Exploration and Production, Houston.

☐ Dallas B. Dunlap, Bureau of Economic Geology, Austin, Texas.

Councilors

Eastern Section

☐ Charles M. Boyer II, consultant, Bridgeville, Pa.

Mid-Continent Section

☐ K. David Newell, Kansas Geological Survey, Lawrence, Kan.

Rocky Mountain Section

☐ Genevieve Young, Colorado Geological Survey, Denver.

Pacific Section

☐ James G. Clough, Alaska Geological and Geophysical Survey, Fairbanks, Alaska.

All EMD councilor terms are 2008-10. ☐

Division of Professional Affairs

President-Elect (President 2009-10)

☐ Paul W. Britt, Texplore Inc., Houston.

☐ William T. Goff, Cholla Production LLC, Littleton, Colo.

Vice President

☐ Michael R. Canich, Equitable Production, Pittsburgh.

☐ Daniel M. Reynolds, Coral Coast Petroleum, Wichita, Kan.

Treasurer

☐ Michael A. Fogarty, consultant, Berwick, La.

☐ J. Sirman Hollabaugh, Crescent Oil & Gas, Dallas.

Energy Minerals Division

President-Elect (President 2009-10)

☐ Frank E. Wallis, Devon Energy, The Woodlands, Texas.

☐ Frances J. Hein, Alberta Energy



As advertised by the meeting's theme, myths were indeed challenged and large crowds added to the excitement and overall success of the recent AAPG-AAPG European Region conference and exhibition in Athens, Greece. More than 1,260 attended, making it the ER's largest meeting ever. Final numbers were being compiled at press time, but a full report on the meeting will be included online at www.aapg.org and in the February EXPLORER.

HoD Candidates Announced for 2008

Nominees for House of Delegates offices for 2008-09 have been announced.

Voting will be held at the 2008 HoD meeting at the AAPG Annual Convention in San Antonio, and the winners will assume office on June 1, 2008.

The chair-elect will assume the House gavel as president for 2009-10.

Chairman-Elect

☐ Deborah K. Sacrey, consultant, Houston.

☐ Stephen A. Sonnenberg, Charles Boettcher Distinguished Chair in Petroleum Geology, Colorado School of Mines, Colorado Springs, Colo.

Secretary/Editor

☐ Sigrunn Johnsen, senior geologist in the North Africa and Middle East department, RWE Dea, Hamburg, Germany.

☐ Erik P. Mason, manager-new ventures west, Gulf of Mexico, Shell Exploration & Production, Houston.

American Association of Petroleum Geologists 2008 Southwest Section Golden Anniversary Convention



February 24-27, 2008

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Field Trip: Pennsylvanian/Permian of the Eastern Shelf

Short Course: Petroleum Engineering for Geologists

General Chair:
Darrell Mauldin (dmauldin@fftam.com)

To Present Papers contact:
David Holley (dholley@suddenlink.net)

Potential Exhibitors contact:
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Potential Sponsors contact:
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READER'Sforum

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.

A Word of Thanks

This is a quick note to let you and other members of your staff know that the AAPG Foundation Library has been a great help in getting publications for me that I otherwise would not have been able to obtain.

The city library here was unable or did not want to spend a lot of time trying to get this information. Mary Kay Grosvald and Karen Piquine have been very helpful. They have been able to get almost all of the articles I requested.

In addition to using these publications in my work, I have been working part time on a paper for several years. I probably would have given up by now if the AAPG Library had not been available.

I believe the library is probably one of the best AAPG membership assets.

Roger Berg
Shreveport, La.

In Agreement

I agree completely with every word of Michael L. Johnson's letter (December EXPLORER) about the Global Climate Change Committee's charge to research potential "solutions" to the "global warming" hoax.

As he said, there are no "solutions" to natural climate change. As any geologist should know, climate change has been going on for most of our geological history.

As a proud member of AAPG for 45 years, I would hate for us to look like a bunch of fools for agreeing with the disaster mongers, who along with Al Gore have no knowledge approaching that of

most geologists.

As the foremost professional geological organization in the world, AAPG should not promote this scam, which will waste trillions of dollars and cause unnecessary regulations on all citizens.

Donald N. Collins
Evergreen, Colo.

Misleading?

The headline "Hot Barnett Play Creating Wealth" (September EXPLORER) is quite misleading.

Landowners, charities and governments are enjoying the large cash flow from the Barnett Shale. From a practical standpoint two-thirds of the Barnett Shale wells will not pay out.

Operators drilling wells in the Fayetteville shale in Arkansas are in a similar marginal situation.

Wells being drilled in the Woodford shale in southern Oklahoma are questionable from an economic standpoint.

How can operators justify drilling hundreds of wells in these areas - spending billions of dollars - when they are looking at a questionable bottom line?

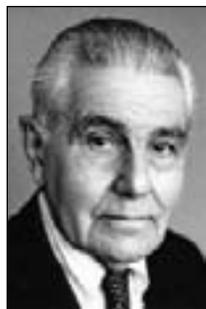
Marvin E. Frankamp
Wichita, Kan.

Something of Value

Regarding the AAPG annual salary survey (April 2007 EXPLORER): Looking at the global increase in petroleum products, geologists must be paid better than this.

Kwabena Antwi W.B
Ahafo Kenyasi, Ghana

INmemory



Salvador



Hare

was active in the Association's resource evaluation efforts, died Nov. 29 in Oklahoma City. He was 62.

Hare, co-president of Panhandle Oil and Gas, was a past chairman and current vice-chair of AAPG's Resource Evaluation Committee.

He received the AAPG Distinguished Service Award in 2004.

Eric Anderson, 65

Fort Worth, October 2007

Roger Borchert, 60

Bismarck, N.D., Oct. 1, 2007

George Dawson, 61

Columbia, Mo., May 2, 2007

Ben D. Hare, 62

Oklahoma City, Nov. 29, 2007

Kent Johnson, 70

San Antonio, Nov. 15, 2007

Robert McMurtry, 83

Marshall, Texas, Oct. 13, 2007

Wilbur Earl McMurtry, 89

Oklahoma City, Oct. 27, 2007

Amos Salvador, 84

Austin, Texas, Dec. 2, 2007

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

Ben D. Hare, an AAPG award winner who

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AAPG's GeoCare Benefits Insurance Program recently joined with Liberty Mutual to offer members "Liberty Mutual Advantage"™ – a program that provides savings on auto and homeowner insurance, in addition to many other personal insurance plans.

With Liberty Mutual Advantage, members can enjoy competitive rates on auto and home insurance, based on a discount system (that varies by state) including membership, education, age, driver background and auto equipment.

Auto rates are guaranteed for 12 months (instead of six months), and automatic monthly payment is offered with no finance charges.

In addition to auto and homeowners, Liberty Mutual also offers personal umbrella liability insurance, renters insurance, condo insurance and boat, RV and motorcycle insurance.

AAPG members may obtain information about the Liberty Mutual

plans via three different means:

- ✓ Internet – Quotes and coverage can be accessed online 24 hours a day, seven days a week. For access go to www.geocarebenefits.com/aapg-autohome.asp.

- ✓ Call centers – The GeoCare toll-free number is 800-789-6419. Call centers are staffed from 8 a.m. to 11 p.m. in all U.S. time zones.

- ✓ Local office – A member can be connected to the nearest Liberty Mutual office (during local business hours) by calling 800-225-8281. The call will be transferred according to the member's requested zip code.

Rates will be the same, regardless which option is used – and for maximum discounts, mention your AAPG membership or AAPG's client number (#112934).

General questions regarding this new program should be directed to the GeoCare Benefits office at 800-254-4788. □

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DIRECTOR'S Corner

Work Force Is a Major Concern

By RICK FRITZ

I started writing this column from Tyumen, Russia – the oil capital of Western Siberia and one of the key “oil capitals” of the world.

Founded in 1586, Tyumen is a great oil city in Siberia that is growing rapidly. It is about the same size as the Tulsa metropolitan area (a bit fewer than 700,000 people) and reminds me of Houston with its great oil and gas atmosphere.

Of course, it's a little colder than either Tulsa or Houston.

AAPG just completed the joint Tyumen Conference and Exhibition with Rosnedra, the Euro-Asian Geophysical Society and Society of Exploration Geophysicists. There were some great talks, and AAPG had a terrific session chaired by John Dolson with featured speakers including Henry Possamentier, Robert Handford, George Pemberton, Dolson, Ekaterina Kuzina, Chris Cornford, Peter Gutteridge, Keith Shanley and Johannes Singer (in order on program).

* * *

The first day of the conference I gave a talk on “developing a global energy work force.” We discussed that even though the world is using a lot of hydrocarbons, we are quickly developing the capacity to produce more.

The reality is that the world is not running out of oil but we are running a little short on people.

Manpower, womanpower, human power, whatever you want to call it – work force is a major concern. It is important to understand that a *people shortage* may be a greater problem to deal with than an *energy shortage*. Serious supply problems of skilled petroleum



Fritz

geoscientists and engineers may make it difficult to complete major new petroleum projects worldwide.

So what are the dynamics?

Let's start at the beginning of the supply chain. Young children have a great love of rocks and dinosaurs; however, as students enter preparatory school, science and engineering are seen by some students as too difficult with math requirements – and other top students may not see the challenge, especially with the lack of advance placement courses in earth science.

The result is there are too few talented young people interested in careers in the energy industry. Many top students tend to choose careers in medicine, law and business because of profile and job security. Generally, we see less students going into science – and new geoscientists tend to prefer government or environmental jobs over petroleum, even though the pay is significantly better in the energy industry.

This is not helped by past job security issues, nor the perception that oil is not “green.”

* * *

So how do we solve a long-term “people” supply problem?

First and foremost, industry, governments, academia, professional

A people shortage may be a greater problem to deal with than an energy shortage.

societies and other related institutions must work together on the solution. AAPG is working with other societies like AGI and GSA and is searching for (and finding) opportunities to work with government entities to study work force. There is a lot of good information from the National Petroleum Council and the National Academy of Sciences.

The following is a summary of goals that may help work force development:

✓ **Improve communications.**

Communication content, style and design are critical to reaching talented young people. Marketing and public relations are important. More recently companies are improving their public relations by good advertising.

✓ **Support and improve teaching in K-12 education.**

One of the best solutions is to train the teachers and provide materials for use in understanding energy needs and the relationship of energy use to the environment.

✓ **Support energy teaching and research in the universities.**

Increased scholarships should be developed for geoscience and engineering and new research grants should be considered for a broad range of energy problems.

✓ **Develop good training programs and opportunities.**

It normally takes four to six years to develop a productive petroleum geoscientist.

✓ **Develop new methods to recruit and retain female and minority geoscientists in the industry.** (See related story, page 32.)

✓ **Develop a globally mobile work force.**

Visa requirements should be reviewed with increased immigration quotas for trained petro-technical professionals and skilled workers.

Energy is a global strategic priority. Building a talented energy work force is a long-term, supply-centric situation.

* * *

As I am finishing my column I am on the “third leg” of my four leg return from Tyumen to Tulsa. The Atlantic fly-over is the longest leg and I call it the “chasing the sun down” stage as I have been watching the same sundown for eight hours now.

Building a global work force may be as frustrating as chasing a sundown – but we are *not* in a sundown industry. Prospects are bright for careers in petroleum geoscience and engineering.

Developing the people to find and produce that energy should be a top priority.

Happy New Year!

Sharing geology stories can have impact

Pathways to Profession Have Tales

By THOMAS E. EWING

DPA President

Maps are my passion. I'm addicted, I freely admit.

When I was four years old, I traced state highway maps. When I was nine, I created a fantasy city on my notebook cover (beats listening to the teacher).

I was given a popular geology book – *Geology of New York City and Environs* – that linked landscapes with the rocks that underlie them. So I went to a geology summer school and discovered the reach of geologic time and the application of scientific method, and my fate was cast – I'll be a geologist!

So I persevered through college and graduate school, and now I make maps through time, discovering the joys of well logs and 3-D seismic on the way. And people take these maps and drill wells from them, and find the energy that propels the world's people towards a better future. Not bad!

* * *

Most of us have some sort of story of “finding” geoscience. This is mostly due to the fact that most schools don't give geology a high profile, and many don't teach it at all.

From my observations, the most



Ewing

frequent reasons we have for finding our professional career are:

✓ **Passion for the outdoors, maps and/or rock collecting that is translated to the geologic story once we're exposed to it – that's my story.**

✓ **Family involvement in**

geosciences or in businesses that use geoscience – particularly oil and gas, but also mining.

✓ **General interest in math and science, which at the university level finds a set of really challenging (and rewarding) problems in Earth's geologic systems.**

These are all great ways for people to come to professional geoscience. Once we get here, we realize that America and the world need energy, and finding and producing energy needs geoscientists like us.

So we join the community of energy resource geoscientists – and we join AAPG.

When we joined AAPG, we signed off that we adhere to the Code of Ethics



enshrined in its Constitution. By joining, we became part of the professional community, and met and networked with our peers and our mentors – whatever company they worked for!

We learn lessons about what it means to be a professional and what it means to work in the energy business.

We create trust and knowledge, we build understanding and a firm resource base, we carry on a distinguished tradition of science applied to the public good.

And to express our professional pride and work on our professional concerns, we become certified and join the Division of Professional Affairs.

* * *

But along with our professional work, we have an obligation to “evangelize” – to give back to the broader community of citizens, to communicate the important insights of geoscience and its impact on world affairs.

One good way to do this is through maps and through history – the geologist's long view of time and space.

Everyone likes stories – true stories even more so. Everyone likes to have an idea how things came to be. And many if not most people appreciate their local landscapes or seascapes and want to know how they came to be and how they might change.

And we as geologists can tell stories – how the mountains have risen and fallen, how shorelines change in a geologic eye blink, how fossil sunlight has been stored over eons until we made it serve our uses and transformed our lives.

Geology upholds our landscapes, it explains what we see, it has guided the history of our societies and the geography of our development.

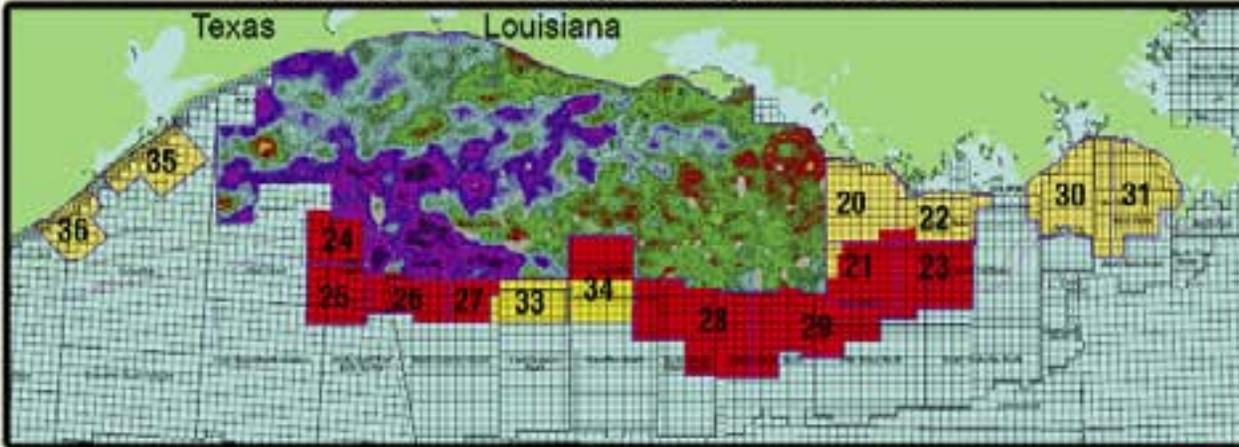
And who knows? Telling stories like these may hook some enterprising young students on geoscience as a career! Worked for me.

Thanks for reading. □

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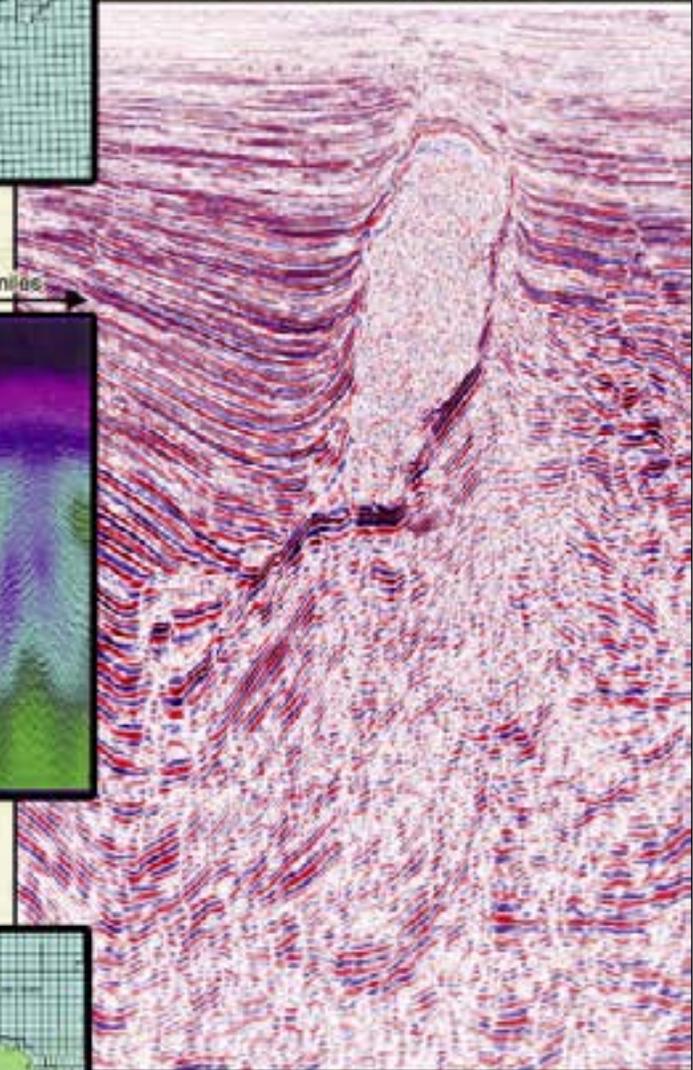
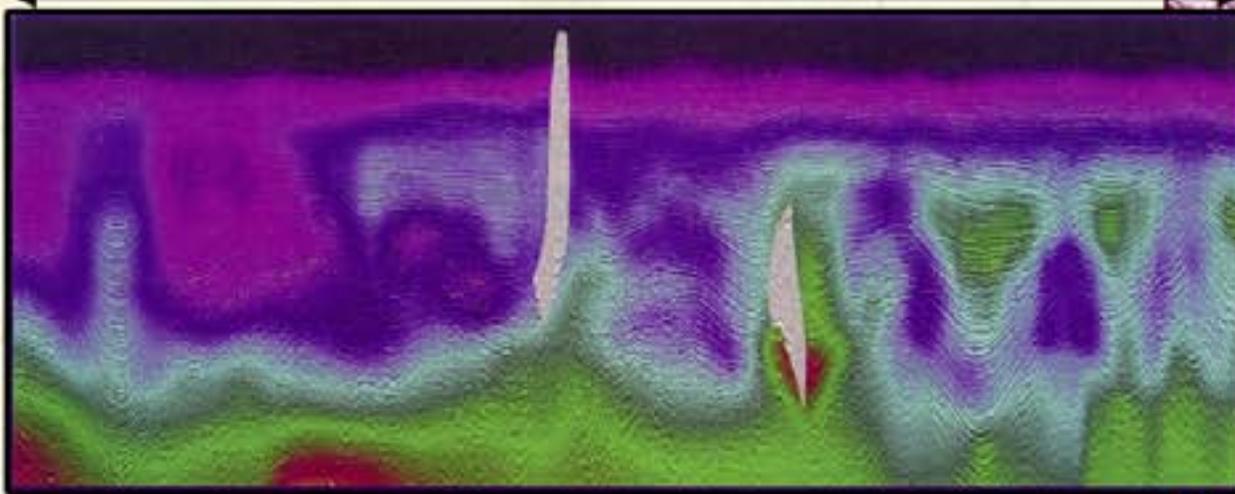
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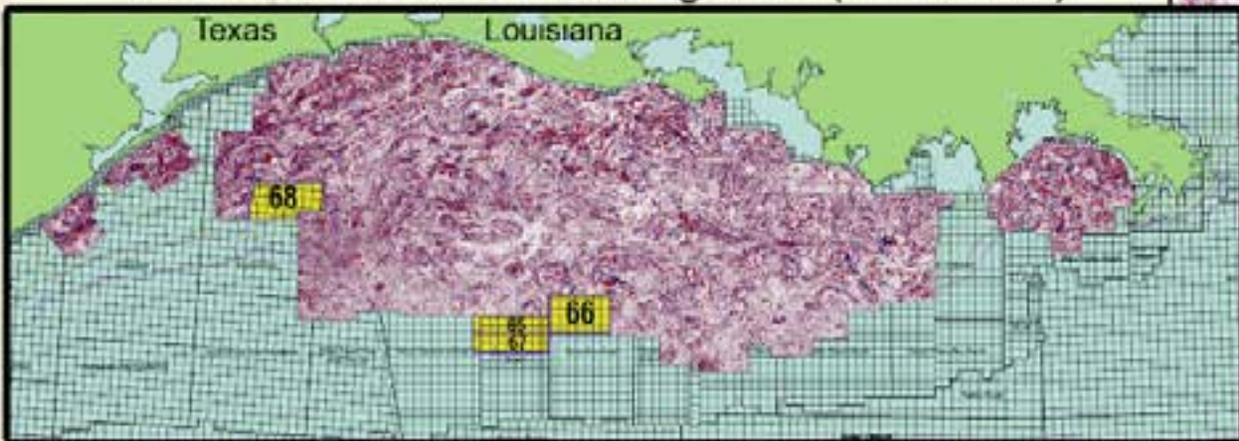


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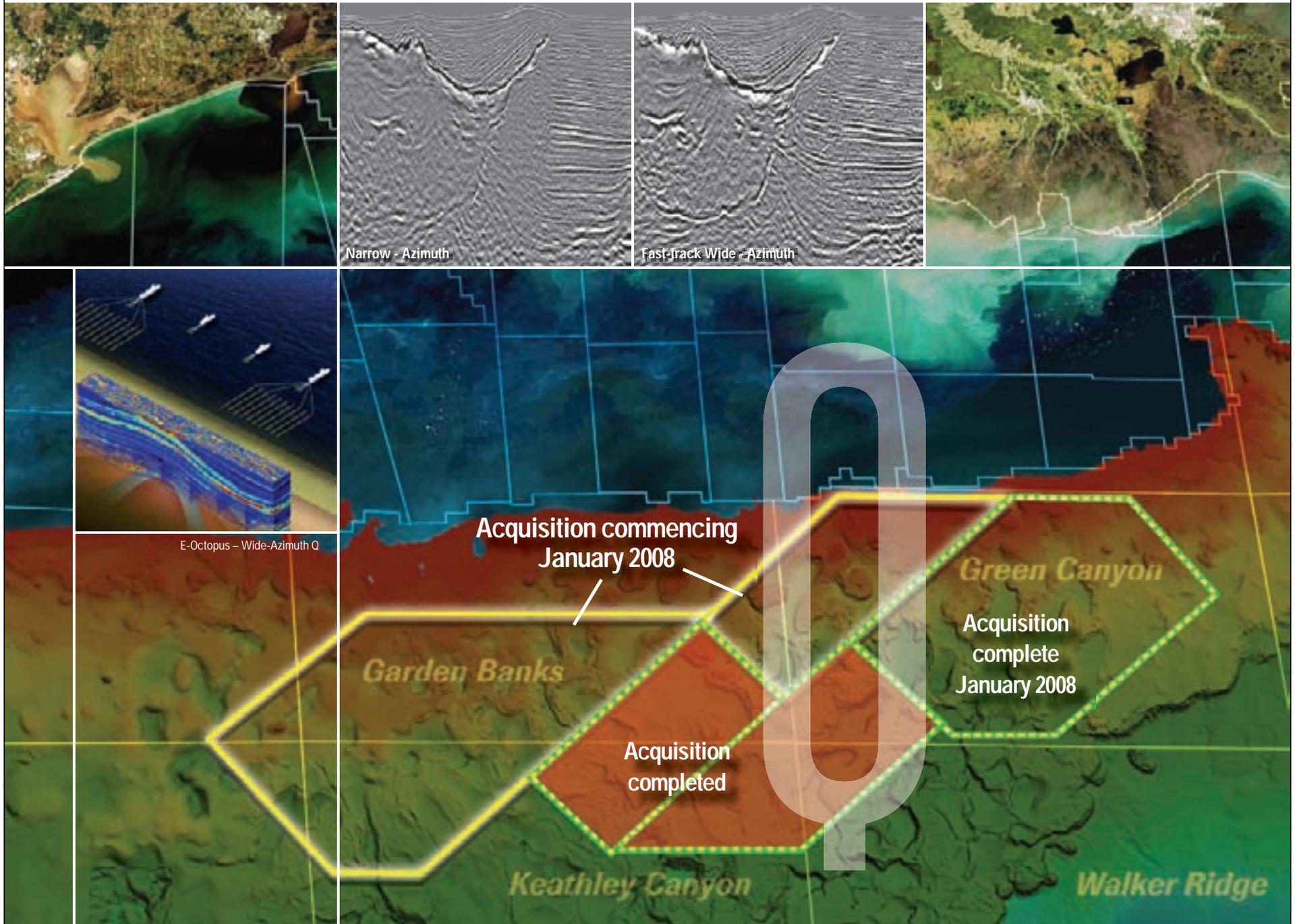


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