



# Shudder Island

Geoscientists return  
to Antarctica's frozen history

See page 18





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**PRESIDENT'S COLUMN**

# 'Communities' Concept Starts to Grow

By TED BEAUMONT

One of the AAPG Executive Committee's priorities during the first five months of this fiscal year has been to study the Association's science program with the goal of creating new conduits for generating and disseminating scientific content.

Fostering communities with specific geologic interests within the Association is an obvious strategy for meeting this goal.

I'm happy to report that under the leadership of Elected-Editor Steve Laubach and the past Vice President-Sections Marv Brittenham, AAPG is indeed considering ways to better empower "communities of interest" within AAPG – that is, community members who share common interests in specific geological subjects.

Several of these communities of interest already have self-organized within AAPG. One example is the "petroleum structure and geomechanics group," chaired by Peter Hennings.

These informal groups are doing excellent science in the background of AAPG – and what we would like to do now is find ways to nurture them without harming them. Our fear is that by formalizing them we might stifle their enthusiasm or creativity.

At the same time, however, we would like to help them share their ideas with the rest of AAPG in new publications and short courses – and the best way to do that probably requires some type of formal structure.

As mentioned, we're happy that at least one of these communities is ready for formal recognition – the petroleum structure and geomechanics group.



BEAUMONT

These informal groups are doing excellent science – what we would like to do now is find ways to nurture them ...

Our hope is that others will be ready in the near future.

\* \* \*

A question being considered by the AAPG Advisory Council, led by past AAPG president Paul Weimer, is what should the formal recognition be?

Should it be as new divisions, like the Energy Minerals Division, for example? Or should it be some new entity within

AAPG, like a "super committee" with authority to create new AAPG science products?

The best part about all of this: AAPG's communities of interest are open to whoever is interested. They are intentionally very informal, so the trick is finding out about what they are and where they are meeting.

And right now, this is mostly accomplished by word of mouth.

If you are interested in starting one

please let someone on the Executive Committee know and we will try to help.

\* \* \*

On a different subject, in many places around the world December is a holiday season. And as such it is a perfect time to consider making a gift to the AAPG Foundation.

The Foundation supports many worthy and significant projects, including Scott Tinker's movie "Switch," the Imperial Barrel Award, AAPG's open access website *Search and Discovery*, Distinguished Lecturers and Grants-in-Aid to students, just to name a few.

Any contribution is appreciated. Have a wonderful holiday season!

*Ted Beaumont*

## Candidates' Bios, Responses Available Online

Video statements from all AAPG Executive Committee officer candidates, most filmed during the summer Leadership Conference in Tulsa, continue to be available online at [www.aapg.org](http://www.aapg.org).

The candidates were filmed responding to the statement, "Why I accepted the invitation to stand for AAPG office."

Biographies and individual information for candidates also remains available online.

Ballots for the election will open in spring 2013. The person voted president-

elect will serve in that capacity for one year and will be AAPG president for 2014-15.

The slate is:

### President-Elect

- Randi S. Martinsen, University of Wyoming, Laramie, Wyo.
- Kay L. Pitts, Aera Energy, Bakersfield, Calif.

### Vice President-Regions

- István Bérczi, MOL Hungarian Oil and Gas, Budapest, Hungary.
- John G. Kaldi, Australian School

of Petroleum, University of Adelaide, Adelaide, Australia.

### Secretary

- Richard W. Ball, Chevron Upstream, Southern Africa SBU, Houston.
- Sigrunn Johnsen, independent consultant with ProTeamAS, Stavanger, Norway.

### Editor

- Colin P. North, University of Aberdeen, Aberdeen, Scotland.
- Michael Sweet, ExxonMobil Production, Houston.

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Susan R. Eaton  
Barry Friedman

## TABLE of CONTENTS

**4** From prospects to discoveries: The art of the deal will be among the valuable lessons shared during the inaugural DPA-sponsored **Playmaker Forum**, coming soon in Houston.

**6** Oklahoma geologists are digging down deep – really deep – in **Osage County** in hope of finding **helium**, gas or CO<sub>2</sub>. Any of those will work – the significance is the potential new province.

**14** It's all about staying on target: Technological advances are helping to make **geosteering** an increasingly valuable tool for geologists involved in horizontal wells.

**16** The proof is in the colors: A new stratigraphic analysis technique, **ChromaStratigraphy**, is being used to record changes in color in rock samples and produce a virtual core for viewing.

**18** One more time: The AAPG Foundation's "explorer-in-residence," Susan Eaton, is returning to **Antarctica** again on a scientific expedition to study the geology and the climate found at the Bottom of the World.

**28** Lost in the flood: AAPG member **Sam Epstein** stayed – and survived the devastating Hurricane Sandy in Rockaway, N.Y. And Gerald Friedman is part of the story ...

## REGULAR DEPARTMENTS

|                               |    |
|-------------------------------|----|
| Washington Watch.....         | 32 |
| Geophysical Corner .....      | 36 |
| Historical Highlights .....   | 38 |
| Spotlight On.....             | 42 |
| Professional News Briefs..... | 43 |
| Regions and Sections .....    | 44 |
| Foundation Update.....        | 45 |
| Readers' Forum.....           | 46 |
| ProTracks.....                | 47 |
| Classified Ads .....          | 48 |
| In Memory .....               | 49 |
| Director's Corner .....       | 50 |
| Divisions Report (DEG) .....  | 50 |

## ON THE COVER:

Ted Cheeseman, an adventurer who specializes in getting explorers to exotic locales, stands atop a peak on Antarctica's Devil's Island, overlooking the Weddell Sea. AAPG member and EXPLORER correspondent Susan R. Eaton returns to the "Bottom of the World" this month as the AAPG Foundation-backed Antarctic Explorer-in-Residence. Story on page 18. Some of what she saw on her previous expeditions there is shown to the left: a colony of gentoo penguins on Booth Island, off the Western Antarctic Peninsula. The scenic and narrow Lemaire Channel separates the island from the Antarctic continent. Both it and the cover photo are courtesy of Cheesemans' Ecology Safaris.



Scan this for the mobile version of the current web Explorer.





## Program Set for Playmaker Forum

The AAPG Playmaker Forum, organized by the DPA, will be held Jan. 24 in Houston at the Norris Conference Center. Sessions will include:

- ▶ The Art of Exploration.
  - ✓ 10 Habits of Highly Successful Oil Finders (Dan Tearpock and Bob Shoup).
  - ✓ Exploration Creativity (AAPG President Ted Beaumont).
  - ✓ Ideas to Profits – Creative Entry Into Successful Plays (Bill Maloney).
  - ✓ Marketing Your Prospect at Prospect Expos (Robert Pledger).
  - ✓ Assembling and Presenting Conventional Prospects (Steve Brachman).
  - ✓ Exploration, Appraisal and Development of Unconventional Reservoirs: A New Approach to Petroleum

Geology (Richard Stoneburner).

- ▶ Established Plays.
  - ✓ Bakken Play and Vision for Domestic Energy (Harold Hamm).
  - ✓ The Marcellus Shale Play (Bill Zagorski).
  - ✓ Discovery, Reservoir Attributes and Significance of the Hawkville Field and Eagle Ford Shale Trend, Texas (Charles Cusack, Jana Beeson, Dick Stoneburner and Gregg Robertson).
- ▶ Emerging Plays.
  - ✓ The Mississippi Lime (Shane Matson).
  - ✓ Utica Shale Ohio (Ken Mariani).
  - ✓ Eagle Bine Activity (Tom Bowman).
  - ✓ Geoscouts: Leveraging AAPG and the DPA to Improve Your Professionalism (Rick Fritz).

Advancing the science

# It's All About the Play

By LOUISE S. DURHAM, EXPLORER Correspondent

Jan. 24, 2013, is set to be a banner day for AAPG's DPA division, which is sponsoring a unique high-impact event on that date in Houston.



STERNBACH

It's the Playmaker Forum, chaired by AAPG Honorary member and DPA president Charles Sternbach.

Numerous AAPG members and others are familiar with the highly popular and

heavily attended series of Discovery Thinking forums conceived and chaired by the forward thinking Sternbach. These successful forums have had a five-year run and are going stronger than ever.

"I wanted to expand the conversation from discoveries to prospects," Sternbach said.

"Discovery Thinking is about discoveries, and Playmaker is about prospecting," he continued. "The concept is that discoveries are the prospects that work."

The upcoming daylong meeting has a speaker roster of industry heavy hitters who will share insight on some of today's hottest plays – and more.

There's even a "Top 10" on the program dubbed Ten Habits of Highly Successful Oil Finders.

"The thought was, wow, if we did a program like this we could advance all the goals of DPA that include providing member services, helping with all the prospecting, professional skills and inspiring our members," Sternbach noted.

"We're also working to get a lot of young professionals involved," he said. "In just one day, they can learn skills on prospecting from the experts that they can use immediately."

**"I wanted to expand the conversation from discoveries to prospects."**

"This is not your father's drawn out 10-week-long industry course," he said. "This is right now; this is the bottom line."

"I think the one-day format is an incredibly potent format," he added. "It's easier for people to break away to attend, and they get a lot of value for the trip if they come in from other cities."

"We intended to really pack it in with the program."

Harold Hamm, the high-profile CEO of Continental Resources, will step up to the dais as keynote speaker. Additionally, Hamm will be honored as the recipient of the DPA Heritage Award, the division's highest award, in recognition of his contributions to the industry and for providing inspiration to other professionals.

Coincidentally, the meeting will take place two weeks prior to the annual winter NAPE meeting in Houston.

"That way, people can use the skills learned to better evaluate prospects and deals," Sternbach asserted. "If they're still in the process of creating marketing material, two weeks gives them enough time."

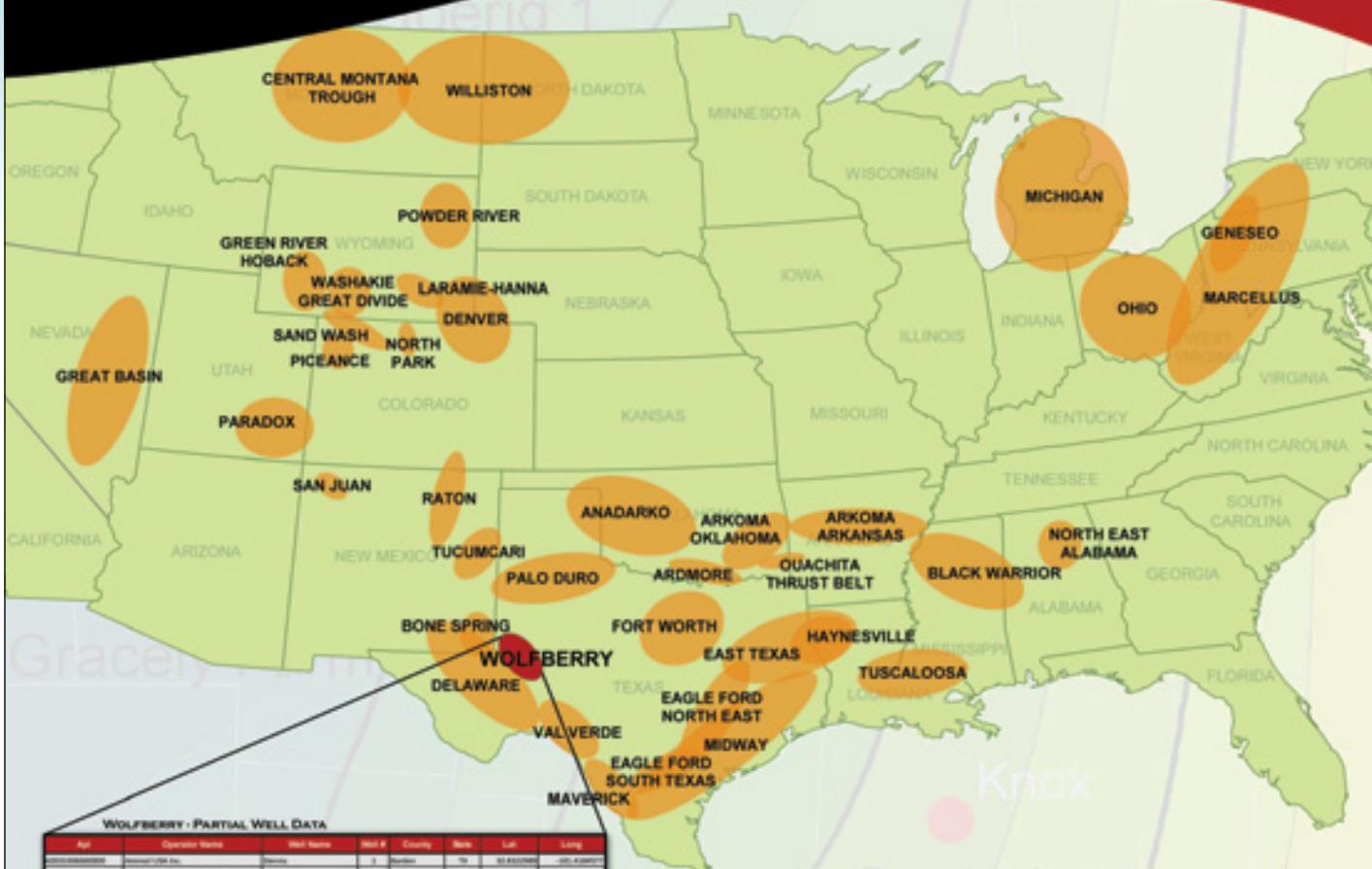
"This kind of program we're providing is fundamental to what AAPG members are the best in the world at doing – prospecting and oil finding," he said. "These skill sets drive our economic engines, yet a lot of conferences these days tend to be commercial and not focused on professional skill sets like the Playmaker program will do."

If you're concerned that it's too late to participate in some manner in this *sui generis* happening, not to worry.

Sternbach emphasized that corporate sponsorship opportunities are still available. ☐

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WOLFBERRY - PARTIAL WELL DATA

| Well # | Operator Name         | Well Name      | Well # | County | State | Lat       | Long       |
|--------|-----------------------|----------------|--------|--------|-------|-----------|------------|
| 1      | Continental Resources | Continental 1  | 1      | Waller | TX    | 30.440000 | -95.150000 |
| 2      | Continental Resources | Continental 2  | 2      | Waller | TX    | 30.440000 | -95.150000 |
| 3      | Continental Resources | Continental 3  | 3      | Waller | TX    | 30.440000 | -95.150000 |
| 4      | Continental Resources | Continental 4  | 4      | Waller | TX    | 30.440000 | -95.150000 |
| 5      | Continental Resources | Continental 5  | 5      | Waller | TX    | 30.440000 | -95.150000 |
| 6      | Continental Resources | Continental 6  | 6      | Waller | TX    | 30.440000 | -95.150000 |
| 7      | Continental Resources | Continental 7  | 7      | Waller | TX    | 30.440000 | -95.150000 |
| 8      | Continental Resources | Continental 8  | 8      | Waller | TX    | 30.440000 | -95.150000 |
| 9      | Continental Resources | Continental 9  | 9      | Waller | TX    | 30.440000 | -95.150000 |
| 10     | Continental Resources | Continental 10 | 10     | Waller | TX    | 30.440000 | -95.150000 |

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*Is a new helium province possible?*

# Oklahoma Geologists are Basement-Bound

By DAVID BROWN, EXPLORER Correspondent

In mid-November, the Wah-Zha-Zhi #1-Deep well began drilling toward basement in Oklahoma's Osage County.

It's not going to stop.

The bottom of the sedimentary section in Osage County is at about 4,500 feet. Plans call for the well to go twice as deep.

And it's not going to stop there, either.

"This is actually quite exciting. It's very cool. We're either going to learn a whole lot about basement, or we might even find something economic," said AAPG member Kurt Marfurt, professor of geophysics at the University of Oklahoma.



WICKSTROM

Osage County recently has been home to the likes of actors Meryl Streep and Julia Roberts and even George Clooney, on site for the film version of the prize-winning play "August, Osage County."

But now, Osage County also will be home to one of the most historic – and geologically interesting – wells in the United States.

Spyglass Energy Group in Tulsa is operating the Wah-Zha-Zhi well, drilling to 10,000 feet true vertical depth south of the town of Foraker, about 50 miles



*Osage County, Oklahoma, currently is home to one of the most historic – and geologically interesting – wells in the United States.*

northwest of Tulsa.

"We acquired a 3-D seismic survey several years ago, said AAPG member

and Spyglass Energy principal

Charles Wickstrom. "In interpretation we discovered a basin with mapable

reflectors below the rhyolite basement."

Marfurt confirmed that something is there, definable by the 3-D seismic work, structurally highly deformed and with steep dips up to 30 percent.

"We see reflectors like that through several surveys of Osage County, Oklahoma. It's clearly not a seismic artifact. It's not a multiple," Marfurt said.

"It could be a Precambrian sedimentary basin. It could be a volcanic intrusion, a sill," he added. "We don't know."

Ultimately, there was only one way to determine what the feature is and what it might contain:

Drill a hole into it.

Wickstrom said Spyglass has chosen Native American names for several of its recent wells. "Wah-Zha-Zhi" is the original Osage language word for "Osage," he noted.

The well should reach target depth some time in December.

"We're going to drill with air as far as possible, but we'll be able to switch over to a rotary mud system if necessary," Wickstrom said.

While the idea of discovering hydrocarbons that far into basement is intriguing, Spyglass Energy has a somewhat more exotic possibility in mind.

"The attraction is really that we are in a helium province," Wickstrom said. "We're

[See Osage County, page 8](#)

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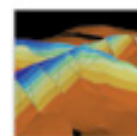
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**Osage County**  
from page 6

looking at this as a helium play that could have natural gas or oil associated with it. Or CO<sub>2</sub>. We'll take any of the above."

**Helium – And Other Targets, Too**

Gas produced from the shallower sedimentary sections in Osage County has shown about three-quarters of 1 percent helium, Wickstrom noted.

The attraction of helium comes from both its growing scarceness and its price. Helium prices have risen sharply in recent years, climbing past \$80 per thousand cubic feet. (See related story, page 10.)

The Federal Helium Reserve near



KELLER

**"Those images below – where the basement is – were striking. It looks like a basin down there."**

Amarillo, Texas, is a major commercial source of helium. The U.S. Bureau of Land Management has announced that the government's open sale helium price for fiscal year 2013 will be \$84/Mcf, up from \$75.75/Mcf in 2012.

Only a handful of companies target helium production. Wickstrom said helium is used as a background gas in spectroscopic analysis of natural gas, and requires special testing to identify

and quantify.

Wickstrom thinks hydrocarbon production also is a real possibility, even though the identified basin is more than 5,000 feet below the theoretical basement top. He said shale could be present as a source rock, or sourcing could come from Arkoma Basin shales.

"Downdip you've got Woodford Shale all over the place. I don't think there's a difficulty getting source into there,"

Marfurt said.

Of course, if the Wah-Zha-Zhi finds oil, the crowd will go wild.

That possibility isn't completely far-fetched, said AAPG member G. Randy Keller, director of the Oklahoma Geological Survey in Norman.

"Those images below – where the basement is – were striking. It looks like a basin down there," he said.

"One could imagine a purely traditional play," he added. "We have no idea what those reflectors are, but they look sedimentary."

Keller described the shallower Osage County layers as a series of sedimentary zones that have been highly productive for both oil and natural gas. That history of prolific production extends back to discovery of the giant Burbank oil field in 1920.

"Then you get to the Precambrian basement," he said, "which we have the bad habit of assuming is just a big layer of granite, in the most basic sense of the term."

Production out of basement rock does occur in other parts of the world, notably offshore Vietnam and in North Africa. And wells have produced from fractured Precambrian basement rock in central Kansas.

"I've been studying Precambrian production around the world for several years now," Keller said. "They just found Precambrian oil in Australia."

**Surprise!**

A pertinent paper on the Osage County basement structures appeared in the AAPG BULLETIN in 2011, Wickstrom said. Authors were Olubunmi Elebiju and AAPG member Shane Matson, along with Keller and Marfurt.

Matson is an employee of Spyglass Energy. Elebiju was a University of Oklahoma student who now works for BP.

Their work proposed that a regional episode of extension could have occurred in the early development of the 1.4 billion to 1.34 billion-year-old magmatic province, with basin formation during that interval.

Osage County is bounded by the southern Nemaha Uplift to the west and the Ozark Uplift to the east.

"We are in a very tectonically active area. The shallow structures have been produced for 100 years. The largest structures are related to wrench-fault tectonics, all of them related to the Nemaha Ridge," Wickstrom noted.

Spyglass Energy used a combination of seismic, gravity and aeromagnetic data to analyze the play area, he said. Wickstrom had studied the Mesoproterozoic Midcontinent Rift System (Keweenaw Rift) and understood the potential for early basin formation, but was still surprised when the Osage basement basin emerged from the analysis.

"I've always been intrigued by the Midcontinent Rift, and we were aware of the possibility that deeper basins could exist," Wickstrom said.

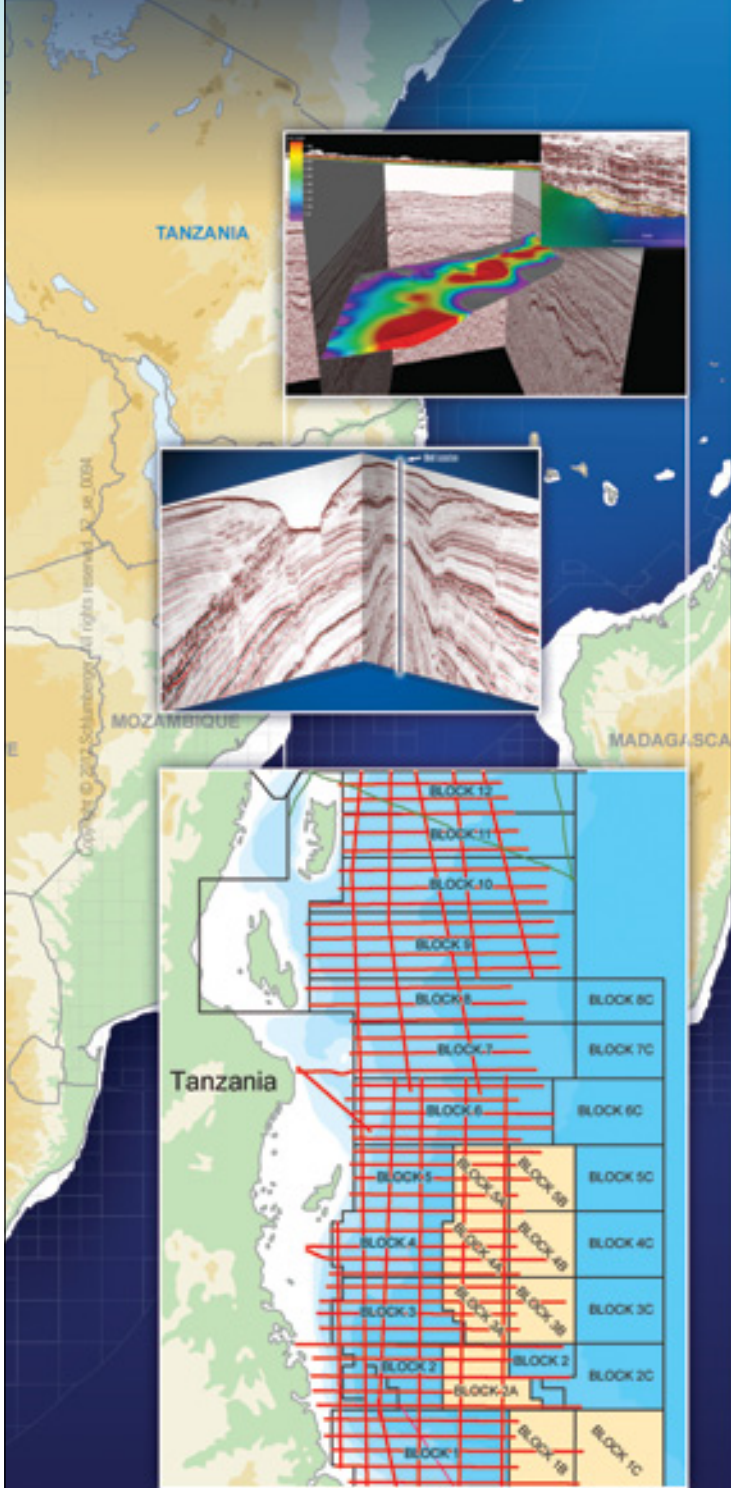
"I can tell you, we weren't expecting it," he added.

If nothing else, the Wah-Zha-Zhi well should reveal significant new information about the northeast Oklahoma basement.

And then there's the exploration potential. Geoscientists in Oklahoma are pumped, or glowing, or chuffed, or whatever word you want to use.

"As a scientist, I'm certainly very excited," Keller said. "It's a real wildcat thing."

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What goes up might be coming down

# Congress Deadline Looms; Is Helium Doomed?

BY KATHRYN KYNETT

The helium shortage is not a household topic, but it could be in 2013 if the Bush Dome Federal Helium Reserve shuts down as mandated under the Helium Privatization Act of 1996 (Public Law 104-273).

The looming crisis has been known for a while, but the reality is now fast approaching.

A helium shortage would not just affect the Macy's Thanksgiving Day Parade and party balloons. It would make producing a microchip, running and producing a magnetic resonance imaging (MRI) scanner, launching a weather balloon or space ship and running CERN's Large Hadron Collider more expensive – if not impossible.

For some applications, like balloons, helium can be replaced. But for other applications, such as producing an MRI, helium is irreplaceable.

Earlier this year the Senate Committee on Energy and Natural Resources held a hearing to discuss legislative options to avoid shutting down the reserve and have introduced the bipartisan Helium Stewardship Act to extend the life of the reserve.

There is still time for Congress to act – but time is running out.

### A Unique Resource

Some history: The federal government began stockpiling helium in the 1920s for national defense, mainly for early blimps. As required by the Helium Privatization Act of 1996, the Bureau of Land Management (BLM) has been selling helium from the Bush Dome Federal Reserve, located north of Amarillo, Texas, in the Cliffside gas field, to pay off a



KYNETT

\$1.3 billion debt accrued from stockpiling the helium.

The price of helium is a flat rate calculated to pay off the debt with the volume in the reserve over a 15-year time period, and adjusted over the years by the consumer price index.

At the time, this price was higher than the market price – but since 1996 the value of and demand for helium has increased as new and existing technologies have

skyrocketed.

Under the Helium Privatization Act of 1996, the Federal Reserve will shut down upon payment of the helium program's debt, which could occur as early as mid-2013 – and would cause chaos in the helium market.

Helium has become ubiquitous in a variety of industrial, scientific and medical markets because of its unique chemical and physical properties:

- ▶ As the second element on the periodic table, helium is very small. Unlike its neighbor hydrogen, helium is an inert noble gas making it the best gas to use for leak detection, mass spectrometry and for controlling atmospheres.

- ▶ Helium is used for growing semiconductor crystals and preserving important documents – including, for example the Declaration of Independence.

- ▶ Liquid helium is the coldest substance on Earth and commonly used in cryogenics applications and research, where physicists study the behavior of materials at very low temperatures. The largest market for helium is in cryogenics,

See Helium, page 12



Major helium-bearing natural gas fields in the United States, adapted from the U.S. Geological Survey, 2010 Minerals Yearbook, Helium.



## ECHO DATA POOL PROGRAMS

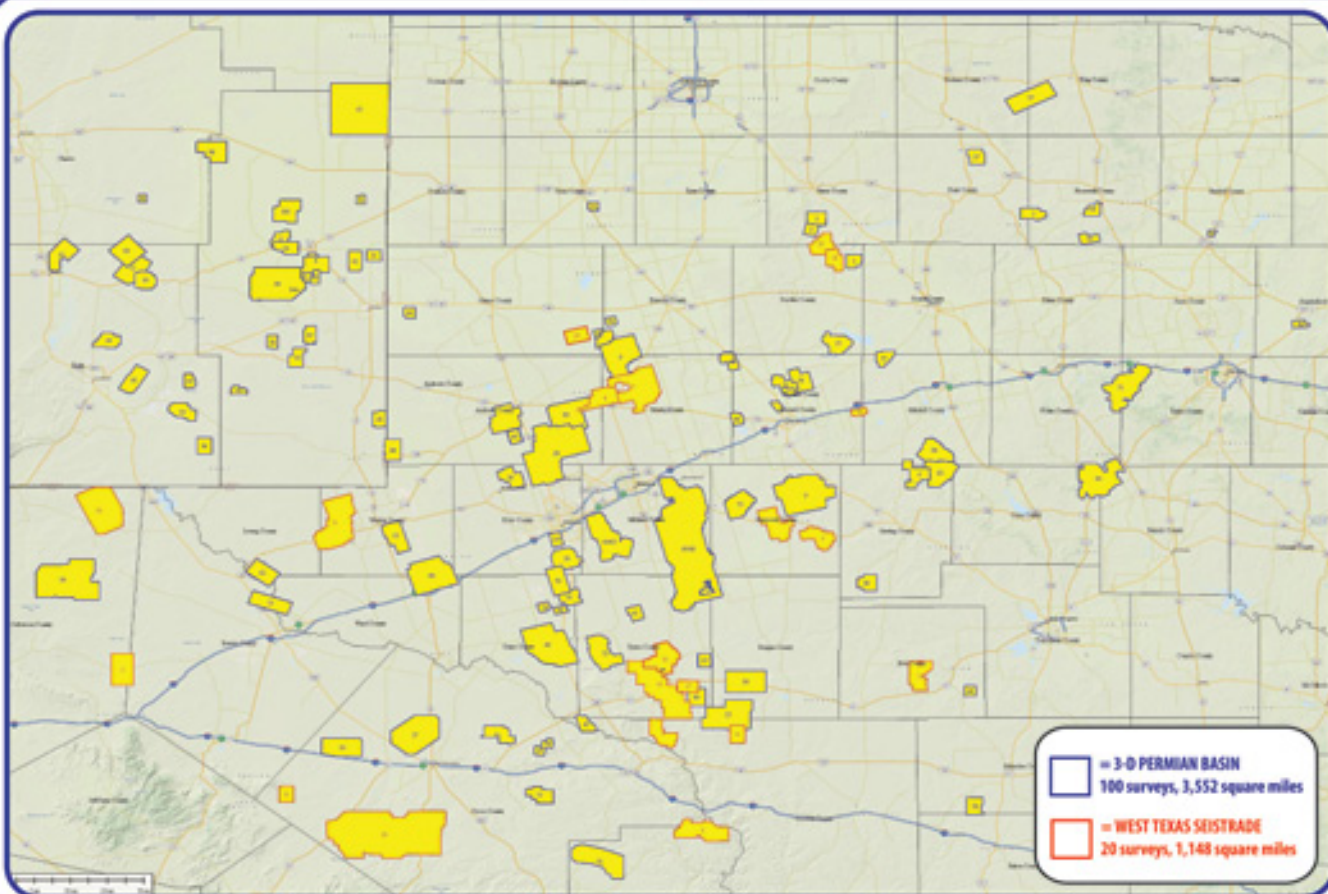


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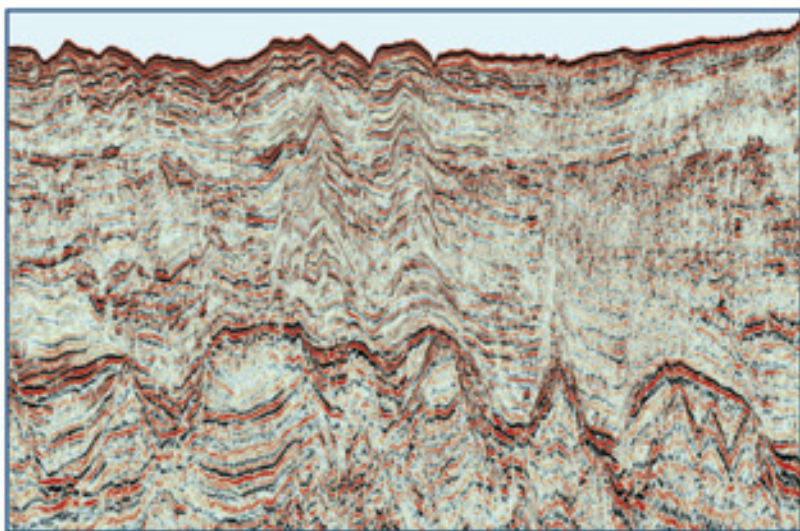
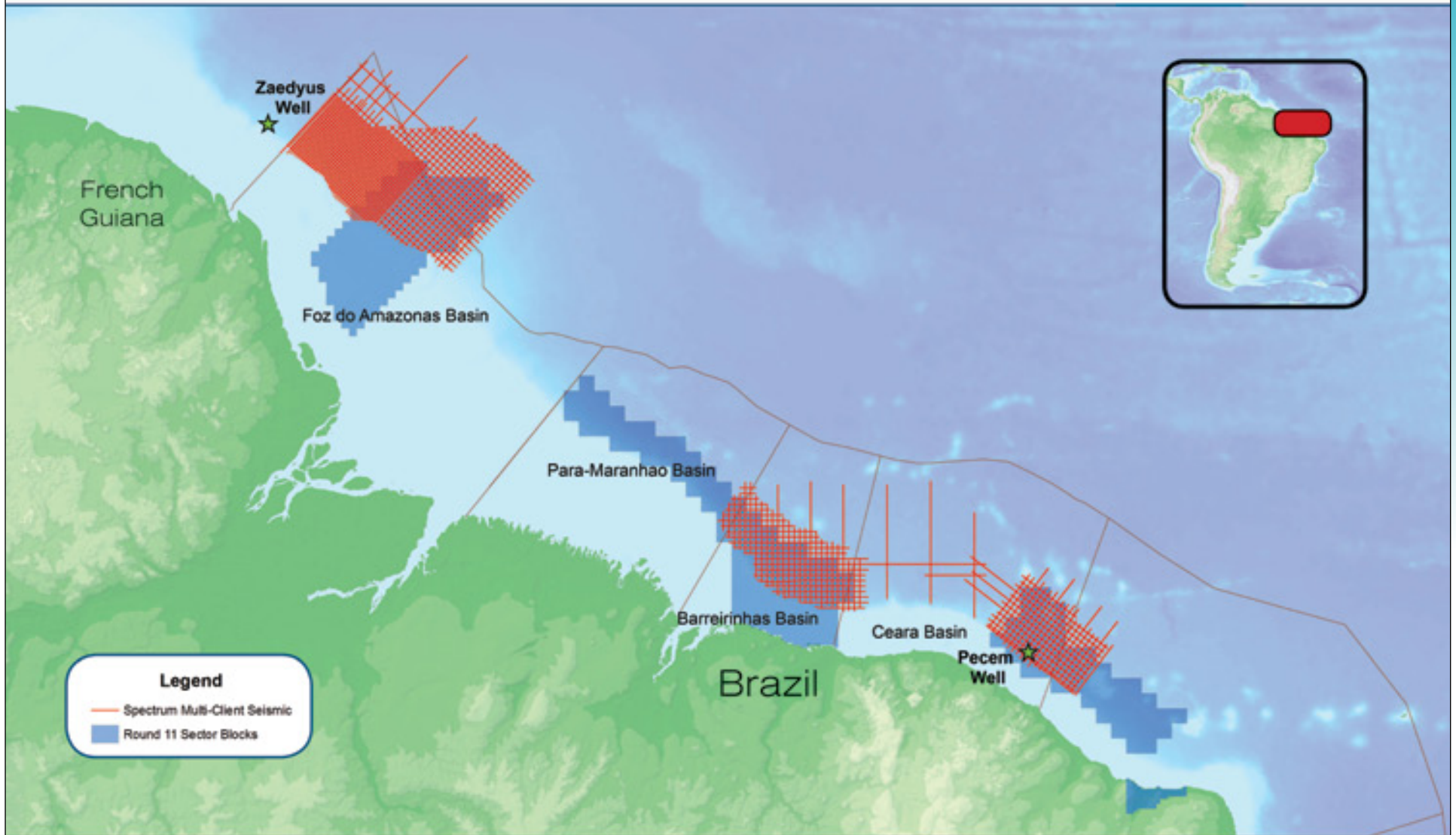


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# Equatorial Margins Brazil

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*Canyon Features from Foz do Amazonas Survey (Phase I)*

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Spectrum has also commenced the next phase of its Foz do Amazonas program, which will acquire an additional 6,000 km over this basin.

Following completion of this new survey Spectrum will have collected over 34,000 km of new, long offset data over these highly perspective areas.

All of these surveys have been acquired with 10,000m offsets and 13 second record lengths. Companies participating in Spectrum's new seismic programs will have a competitive advantage in the upcoming Round 11 in 2013.



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**Helium**  
from page 10

making up 28 percent of its use in the United States, followed by its use pressurizing and purging equipment, which accounts for 26 percent of its use in the United States.

▶ Finally, helium is lighter than air, which is why the federal government originally began stockpiling it in the 1920s, and why the only economically feasible way of obtaining helium is by extracting it from the ground.

Helium forms in locations where the radioactive decay of uranium occurs along with the formation of natural gas – however, it is so light that once it escapes the ground, it floats through the atmosphere to space.

The only economically feasible way to obtain helium is as a by-product of natural gas extraction.

Helium is only a byproduct of natural gas

**While U.S. demand has leveled off in recent years, the worldwide demand has boomed.**

in helium-rich fields, which do not exceed 4 percent helium by volume. Extracting helium from a natural gas field is considered economically viable when the field is higher than 0.4 percent helium.

In most shale gas, the helium has already escaped. Helium usually is vented to the atmosphere when other impurities such as nitrogen, water vapor and carbon dioxide are removed from natural gas.

Currently the Federal Reserve sells helium for such a low price, it is not economical for a natural gas company to capture it while producing natural gas – and as a result, the helium is lost to space.

**Disruptions in the Force**

Almost a century after the government's dreams of helium blimp-aided wars, not only is a third of worldwide crude helium supplied by the Federal Helium Reserve, but two thirds of the worldwide supply originates from the BLM crude helium pipeline system.

The BLM connects a series of private helium extraction and refining plants to the reserve through a 420-mile pipeline system that runs from the reserve in northern Texas through Oklahoma to Kansas. The pipeline provides six private refining plants

with crude helium from the reserve as well as from natural gas plants, which extract helium that are connected to the pipeline upstream of the refiners.

Refiners then produce high-purity gaseous and liquid helium from both the private and federal crude helium supply. Under the Helium Privatization Act of 1996, the BLM pipeline will shut down as well as the Federal Helium Reserve upon payment of the \$1.3 billion debt.

Even with the uncertainty of Bush Dome's future, there are other helium supply disruptions that users are facing – users are experiencing a shortage due to a combination of external events and preferential allocation to federal users.

For example, the ExxonMobil Shute Creek plant in Wyoming, the world's largest single-source helium plant, went temporarily offline in 2011, and another larger plant in Algeria has been offline since an explosion in 2004.

A disruption in the helium supply is felt almost immediately by end-users, as the average amount of time between separation from natural gas and delivery to the end-user is 45 to 60 days – and the Federal Helium Reserve is the only significant depository that stores helium for the long-term in the world.

**The Gathering Storm**

While U.S. demand has leveled off in recent years, the worldwide demand has boomed. In 2007, in fact, the worldwide consumption of helium overtook U.S. consumption.

Currently the United States comprises 40 percent of the worldwide demand followed by Asian nations at 26 percent. The top three runners-up to U.S. helium resources are Qatar, Algeria and Russia.

Expansion is planned internationally – the world's largest helium-refining unit is planned to come online in 2013 in Qatar.

The worldwide demand can be met for the next five years by resources overseas but by relying on these resources the United States would become a net importer instead of exporter for yet another critical resource.

U.S. Senators Jeff Bingaman (D-N.M.) and John Barrasso (R-Wyo.) have introduced the Helium Stewardship Act (S. 2374), which would continue to fund the Federal Helium Reserve while the BLM establishes a market price for helium and transitions the reserve to a source exclusive to federal users.

The bill provides a softer landing for a helium market in danger of crash landing; it accomplishes this by ensuring a responsible and beneficial drawdown of helium in the Federal Reserve in such a manner that protects the interests of users such as private industry, the scientific, medical and industrial communities, commercial users and federal agencies.

If the helium debt is paid-off in mid-2013, and a bill has not passed by then, the Federal Helium Reserve and BLM pipeline will shut down.

The Helium Stewardship Act was introduced in Congress in April 2012 and is awaiting further action. If the bill is not passed in the lame duck session of the 112th Congress, it will have to be reintroduced in the 113th Congress.

Companies that require large supplies of helium, such as General Electric, are addressing the issue by investing in recycling and conservation technologies, which likely will be a trend that continues. There always has been a need for improvement in helium stewardship, but now like never before, there is an incentive.

At present, the fate of the United States as a supplier of helium is up in the air. ☐

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Guessing gone for geologists

# Geosteering Keeps Drillers On the Right Track

By LOUISE S. DURHAM, EXPLORER Correspondent

The headline-creating Austin Chalk boom that kicked off in the late 1980s in south Texas provided a badly-needed ray of hope for industry players who had been sucker-punched by downward spiraling commodity prices earlier in the decade.

The brittle, fractured Chalk had long been a challenge to explorers; the key to its successful yet limited run this time around was the implementation of horizontal drilling technology – for the first time, operators oriented their wells laterally at predetermined depths to tap into far more



GUNN

**“All geosteering is data dependent. The data get pulsed up from the bit, and you have to analyze that data.”**

of the pay zone interval than the long-used vertical wellbores.

It was, however, a tough go for

directional operators trying to stay on target deep in the subsurface, equipped principally with maps.

Given that horizontal drilling was gaining traction as the go-to technology in various locales, heads were coming together to refine the approach.

And at that time, geosteering soon became the “next new thing.”

The technology basically is a means of steering the drill bit with reference to geological markers. The markers often are the top and bottom of the pay zone, frequently defined via gamma ray or resistivity data.

Today, the relatively new “chromalogs,” which identify rock color, are proving successful as a second data point.

In geosteering, subsurface data are interpreted in real time – or true time, to be more precise – to provide the geologist on the well with the information needed to enable the driller to stay on target in the lateral leg.

This is not for the weak at heart, considering the geologist on the well must continuously make decisions “on the run” as the ongoing flow of downhole data are analyzed. Imagine the weighty responsibility of ensuring that the bit remains in, say, a 10-foot zone for a few thousand feet.

It’s essential to know geologically where the well is at all times.

The payoff from the resulting enhanced reservoir contact is worth it to the operator in a number of ways, including:

- ▶ Less oil left behind.
- ▶ Higher cumulative production.

## Seeing Is Believing

It was inevitable the advantages of geosteering would trigger formation of new companies to specialize in this innovative procedure. One of the first to arrive on the scene was Horizontal Solutions International (HSI), which debuted in mid-1990s.

“All geosteering is data dependent,” commented AAPG member George Gunn, vice president at HSI. “The data get pulsed up from the bit, and you have to analyze that data.”

“We depend on the directional drillers/operators to get us the data ASAP so there is no delay in the analysis,” he said. “They either batch it and send it email, or it’s sent out electronically through a data system.”

“Through analysis of the data,” he said, “we’re able to tell them right away where they are stratigraphically, if the angle of the bit is keeping them consistent with dips of the formation they want to be in.”

“We can tell them if they cross a fault, and because of the angle of the bit and the dip of the formation, we can tell if they’re trending toward drilling out of the top or bottom,” Gunn noted. “Knowing that, they can direct the engineer to reorient the bit or continue as is.”

For the uninitiated, AAPG member Jason Slayden, geology manager for the Permian Basin at XTO Energy, delved further into the basics.

His extensive experience with geosteering includes the Woodford shale with its extremely complex structural environment rife with faults and dip changes.

“The reason to use geosteering is, you’re drilling horizontally, so all the markers you’re looking for are stretched out, which makes

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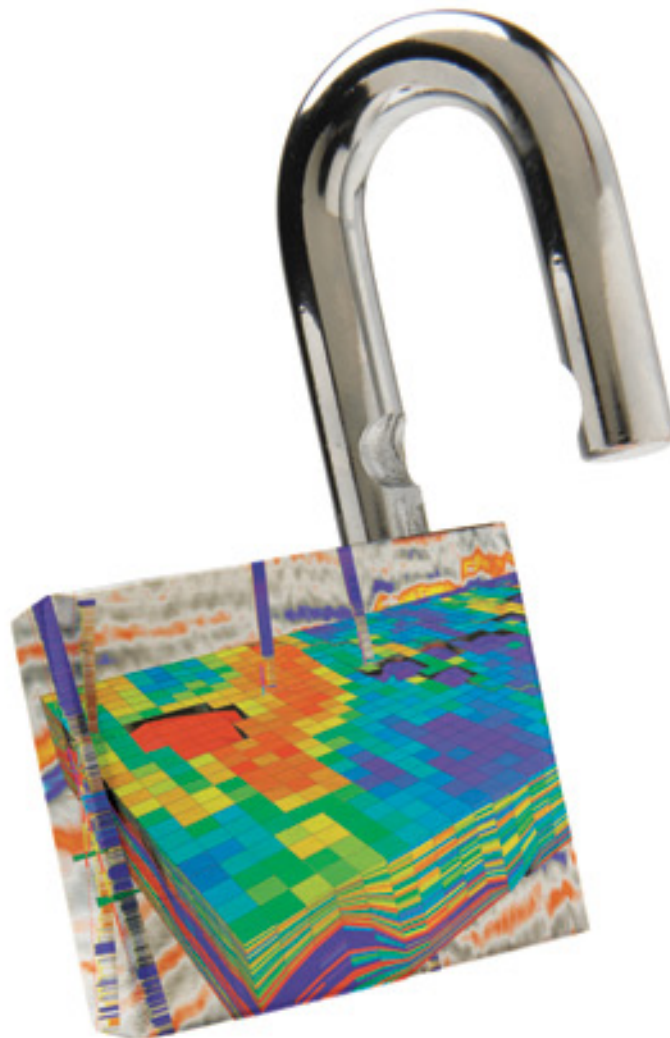


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Every rock tells a story

# Chromastratigraphy: Colors Are the Clues

By LOUISE S. DURHAM, EXPLORER Correspondent

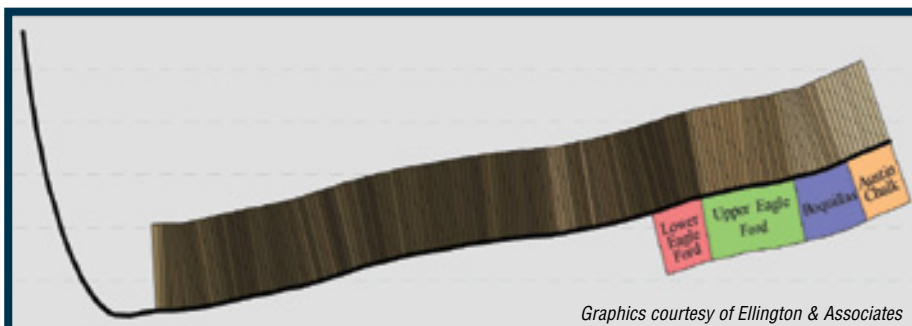
**B**ack in the day, geologist and petroleum engineer William “Bill” Ellington Jr. was gainfully employed as a reservoir engineer who spent his days looking at well logs.



ELLINGTON

Problem was, he wanted to look at rocks.

The opportunity came in 1989, when he joined the company formed by his retired



Graphics courtesy of Ellington & Associates

Geologists using a new stratigraphic analysis tool dubbed ChromaStratigraphy® have discovered a “colorful” approach for correlation of chromatic data in well log format.

geochemist dad. Today, he is an AAPG member and president of a family-owned geologic services company, Ellington & Associates.

“When I went in, I was surrounded by lots of rocks and cuttings, but the only way to make sense of this was to turn them into well log format,” Ellington said. “My goal was to turn cuttings into well logs.

“One thing I noticed when all these cuttings were lined up for processing analysis was the subtle changes in colors,” he said. “We were trying to create logs for all sorts of properties but not creating logs for color changes, so that was the quest.”

The “quest” turned out to be a 10-year journey for Ellington and his colleagues, as they continued to use a variety of techniques to try to capture the colors of the rocks – but never were they quite happy with the product.

And then, ironically, an industry disaster triggered an all-out effort that led them to success.

When the infamous Macondo blowout occurred it shut down about half of the company’s business because so much of their work was in the Gulf of Mexico.

“We then spent considerable time doing self-funded research, and that’s when we perfected the techniques to get the product out,” Ellington said.

“The changes in color in the rock have a story, yet no product was recording those colors; they are easily recordable so you’re able to log those changes.”

“One thing I noticed was the subtle changes in colors.”

### A Colorful Creation

The resulting new stratigraphic analysis tool, dubbed ChromaStratigraphy®, can be defined as a quantitative technique for the rapid, reproducible characterization and correlation of chromatic data in well log format.

Quantitative chromatic data can be reproducibly acquired from ditch cuttings, core or outcrop samples on rocks from any region or age, according to AAPG member Doug Kneis, senior sales adviser at Ellington & Associates.

Here’s how it works: Raw color data are extracted from saturated slurries of pulverized sample and distilled water “using an imaging device and proprietary software to calculate an average color for that depth or interval,” Kneis said.

This process, he added, can be implemented in a lab setting or at the rig site for near real-time results.

“A key element of ChromaStratigraphy is the graphic display of the reconstructed color from the measured samples, which produces a virtual core much like viewing a real core or outcrop,” he noted. “This enables immediate recognition of facies and formation changes, particularly in well documented settings.”

See Colors, page 24



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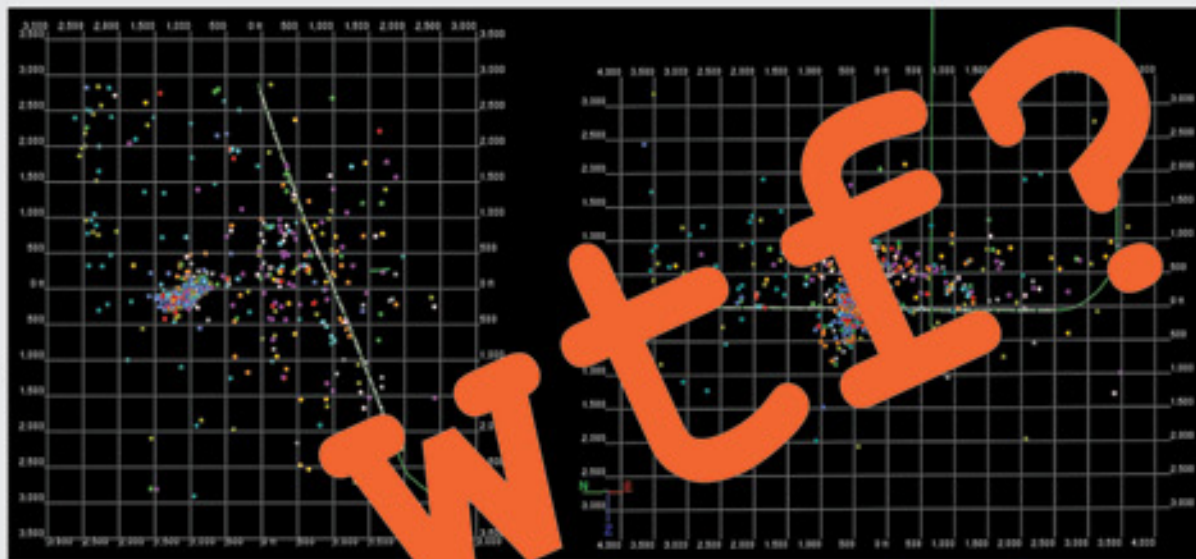
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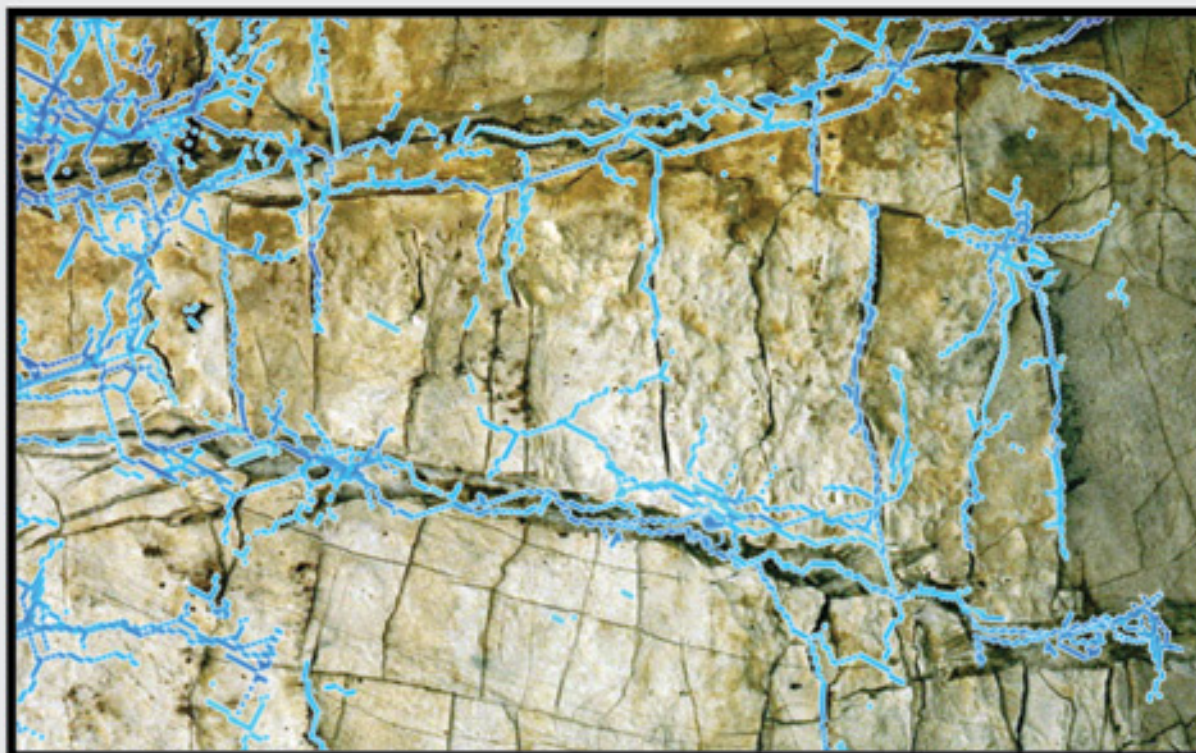


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Susan R. Eaton, an AAPG member for nearly 30 years and a Calgary-based AAPG EXPLORER correspondent for more than a decade, is AAPG's Antarctic Explorer-in-Residence. Members can follow Eaton's next expedition via her blogs from the Falkland Islands, South Georgia and Antarctica as she participates in a geology and geophysics expedition from Dec. 29 to Jan. 19.

## No More Leopard Seals – This Time, Her Feet Will Be On Solid Ground

I was snorkeling in a gin-and-tonic mix of brash ice near a gentoo penguin colony in Antarctica when a leopard seal charged me, not once but three times, its mouth agape and jaws seemingly detached.

Squaring off face-to-mask – the leopard seal's face, my scuba diving mask – I counted the freckles on the animal's upper palate and inspected its deadly tri-serrated teeth.

Charismatic predators of the Southern Ocean, leopard seals weigh in at 1,400

pounds and they can dispatch a 40-pound penguin in mere seconds.

In order to get up-close-and-personal with these beautiful creatures, snorkelers brave -2 degrees C waters and hang out with penguins, their primary prey.

I held my ground (and my breath) during the consecutive bluff charges, pulling my arms towards my core and diverting my eyes downwards. Once



Photo courtesy of Emory Kristof  
Eaton and the "critter cam."

the animal determined that I was neither predator nor prey, an underwater ballet ensued between this graceful animal and the not-so-graceful snorkeler.

It was a magical moment that I'll never forget.

Bitten by the polar bug, I'll return to Antarctica this month, from Dec. 29 to Jan. 19, participating in my third Antarctic expedition since 2010 – and my second trip sponsored in part by the AAPG Foundation.

The expedition is called "Antarctica, South Georgia and the Falkland Islands Scotia Arc Tectonics, Climate and Life." Led by Ian Dalziel, professor of geological sciences at the Jackson School of Geosciences at the University of Texas at Austin, the expedition will focus on the interplay between geology, geophysics, glaciology, plate tectonics, climate and life.

This time, I'm intent on exploring Antarctica from above the water, with my feet squarely planted on terra firma.

– SUSAN R. EATON

## Foundation's 'Explorer' returns to Antarctica

# Scientists Will Explore a Frozen Classroom

By SUSAN R. EATON, EXPLORER Correspondent

Antarctica, the world's final frontier, represents an outstanding outdoor laboratory to research planetary processes, including the impacts of climate change and ocean change. During the past 50 years, the Western Antarctic Peninsula has warmed three degrees C, triggering a cascading series of geological and biological changes in this fragile ecosystem that have global implications.

During the past two years I've used Antarctica as an experiential teaching platform, speaking to many of AAPG's key stakeholders about the pivotal role that geoscientists play in studying climate change and ocean change.

Whether presenting to an audience



Photo courtesy of 2041/2012 International Antarctic Expedition

**Ice Palace:** Members of the 2012 International Antarctic Expedition took a moment to commemorate their trip with this photo. Susan R. Eaton, the AAPG Foundation-backed Antarctic Explorer-in-Residence, was the trip's sole geoscientist. This time, she won't be alone.

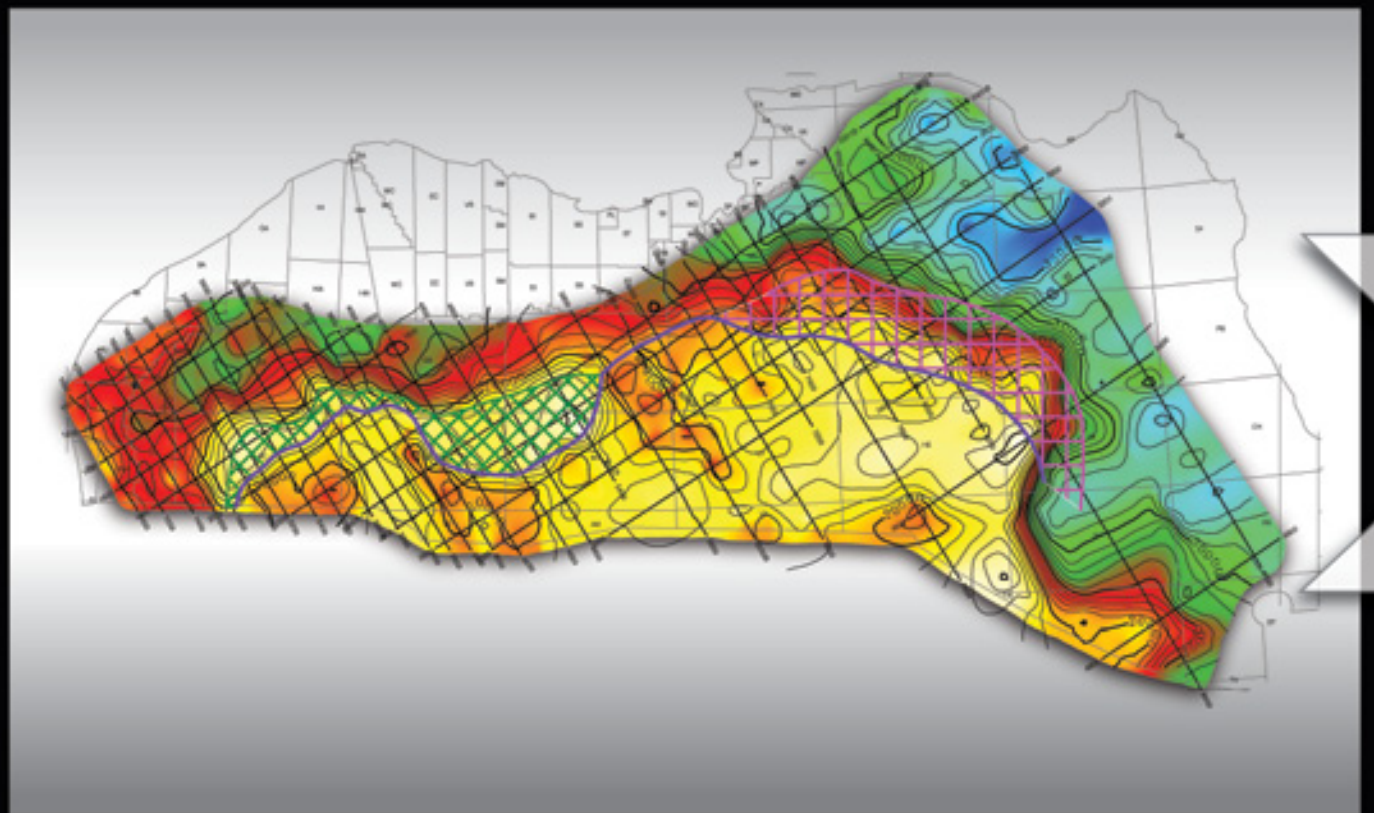
of 2,100 junior high school students in Calgary – who enthusiastically drummed their feet on the auditorium floor as I walked onto the stage – or speaking to the New York Explorers Club, my role as a geoscientist is to translate what I learn in Antarctica, educating and empowering people to formulate scientifically-driven global solutions for today's social, economic, energy and global sustainability challenges.

As the AAPG Foundation's Antarctic Explorer-in-Residence, I invite you to join me, virtually, as I explore the Bottom of the World.

Continued on next page

**"The whole is greater than the sum of its parts."**

- Aristotle



First ever seismically derived map of Moho across the entire deep-water Gulf of Mexico.



SuperCache data are revealing a new, consistent picture of the crustal architecture across the entire Northern Gulf of Mexico. It is complex and unique – it is also different in different parts of the basin. The data image the Moho for much of the basin and define the crustal transition. The result? A paradigm shift in the way we view the tectonics of the basin and explore for hydrocarbons.



Ian Dalziel, conducting geophysical work in the field, in Antarctica.  
Photo courtesy of the Jackson School of Geosciences



Continued from previous page

**'The Dimension of Time'**

Organized around the 125th anniversary of the Geological Society of America (GSA), it and the Jackson School of Geosciences have assembled a world-renowned group of earth science professors from the Jackson School of Geosciences, Stanford University, Pennsylvania State University and the Federal University of Rio de Janeiro.

The expedition begins in the Falkland Islands and continues to the island of South Georgia and the Western Antarctic Peninsula (the three areas constitute the "Scotia Arc").

AAPG member Sharon Mosher, dean of the Jackson School of Geosciences and chair of GSA's 125th anniversary celebrations, said that "In honor of the

GSA anniversary we'll be celebrating advances in geoscience – our science, our societal impact and our unique thought processes – with a series of meetings, field trips and publications throughout 2013.

"We decided that it was only fitting to have the inaugural event be a grand expedition to one of the most remote and fascinating geological areas which surrounds the Scotia Sea," she said.

Mosher, who is participating in the Scotia Arc expedition, explained that a similar trip, celebrating the International Geologic Congress in 1989, spawned decades of research on Rodinia, the supercontinent that existed between 1.1 billion and 750 million years ago.

"Who knows what new ideas we will discover on this voyage?" she asked.

**See Antarctica, next page**

## This Time, Expedition Has Urgency

A century ago, Sir Ernest Shackleton's scientific teams of geologists and geophysicists explored Antarctica because it was there, and because it was unclaimed by any nation.

During this heroic age of Antarctic exploration, geoscientists discovered volcanoes, mountain ranges, fossils, coal and minerals in this uncharted continent.

In 1909, geoscientists in Shackleton's Nimrod Expedition planted the British flag at the South Magnetic Pole.

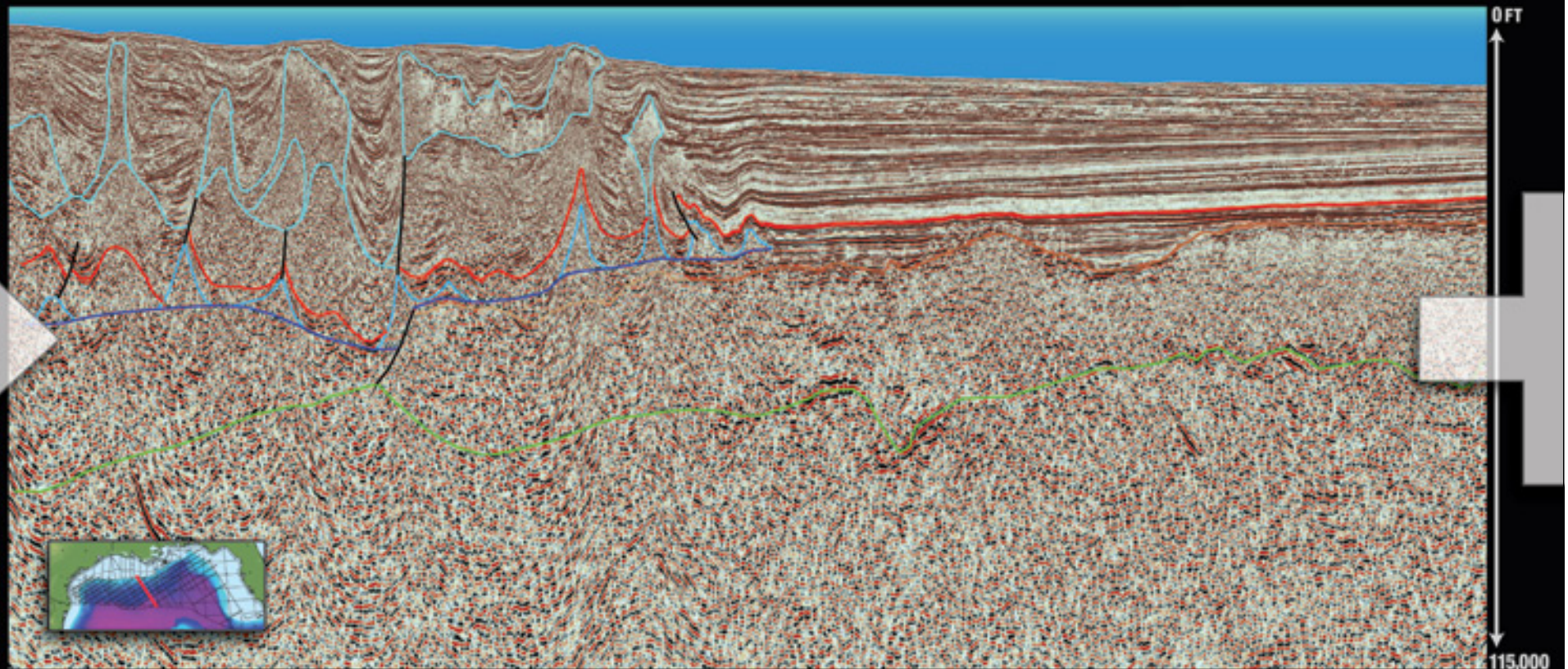
Antarctica still contains many geological secrets: In 2009, Columbia University's Lamont-Doherty Earth Observatory Institute deployed an

airborne gravity system in Antarctica's Gamburtsev Province, discovering sub-glacial ghost mountain ranges – extending 800 kilometers, or the length of the European Alps – and sub-glacial lakes.

One hundred years later, Antarctica is still unclaimed by any nation. This mysterious continent belongs to citizens of the world and is development-free until 2041, when the Madrid Protocol, declaring it a place for peace and scientific endeavors, expires.

Today geoscientists explore Antarctica, not because it's there, but because it might not be there – in its icebound majesty – in the future.

– SUSAN R. EATON



Step up fault imaged, Jurassic sediments under frontal salt nappe.

The data provide constraints to basin-scale heat-flow models which allow us to better estimate hydrocarbon type, quality, quantity and distribution. SuperCache is a synthesis of record-setting seismic acquisition parameters with gravity and magnetic data, imaging technology and research by experts in the geology of the Gulf of Mexico. The result is a step-change in understanding of new play concepts and more efficient exploration at basin-scale.



## Antarctica from previous page

One hundred intrepid explorers from 15 nations will travel – on a voyage of discovery for 22 days – aboard the MV Akademik Ioffe, a 117-meter-long, Russian ice-strengthened vessel. The explorers will study the dynamic Earth and the relationship between plate tectonics, glacial processes, climate and life. And, they'll experience numerous Serengeti-like moments, witnessing some of the largest concentrations of wildlife on the planet.

Dalziel, the expedition's scientific leader, is a research professor with the University of Texas Institute for Geophysics and a Fellow of the Geological Society of America. He has over 40 years of Antarctic experience in plate tectonics and volcanism.

A self-described "old-fashioned structural geologist," his Antarctic research involves studying the interaction between plate tectonics and the environment.

"Climate change is happening," Dalziel said. "There are uncertainties, and we're trying to quantify them – one thing that earth scientists bring to the table is the dimension of time."

### Deep Factors

Rapid warming of the Western Antarctic Peninsula has attracted global scientific attention, and geoscientists, biologists and oceanographers are working together to quantify the changes taking place in our planetary environment.

Describing Antarctica and the Scotia



Photo courtesy of Robert B. Dunbar

A region of great mystery and beauty: A dramatic iceberg in the Western Antarctica peninsula.

Arc as the "nexus of the world's great climate engine," Dalziel said, "You can't understand the climate unless you understand the solid Earth. Things happening in the interior of the Earth can impact the surface of the Earth in a way that biology cannot."

Dalziel's research quantifies isostatic rebound of the land below Antarctica's continental glaciers, and suggests that it's occurring at a rate of one millimeter per year. Using airborne gravity surveys and a network of on-the-ground seismic stations, he measures the density of Antarctica's continental ice sheets and of the underlying Earth's crust and mantle.

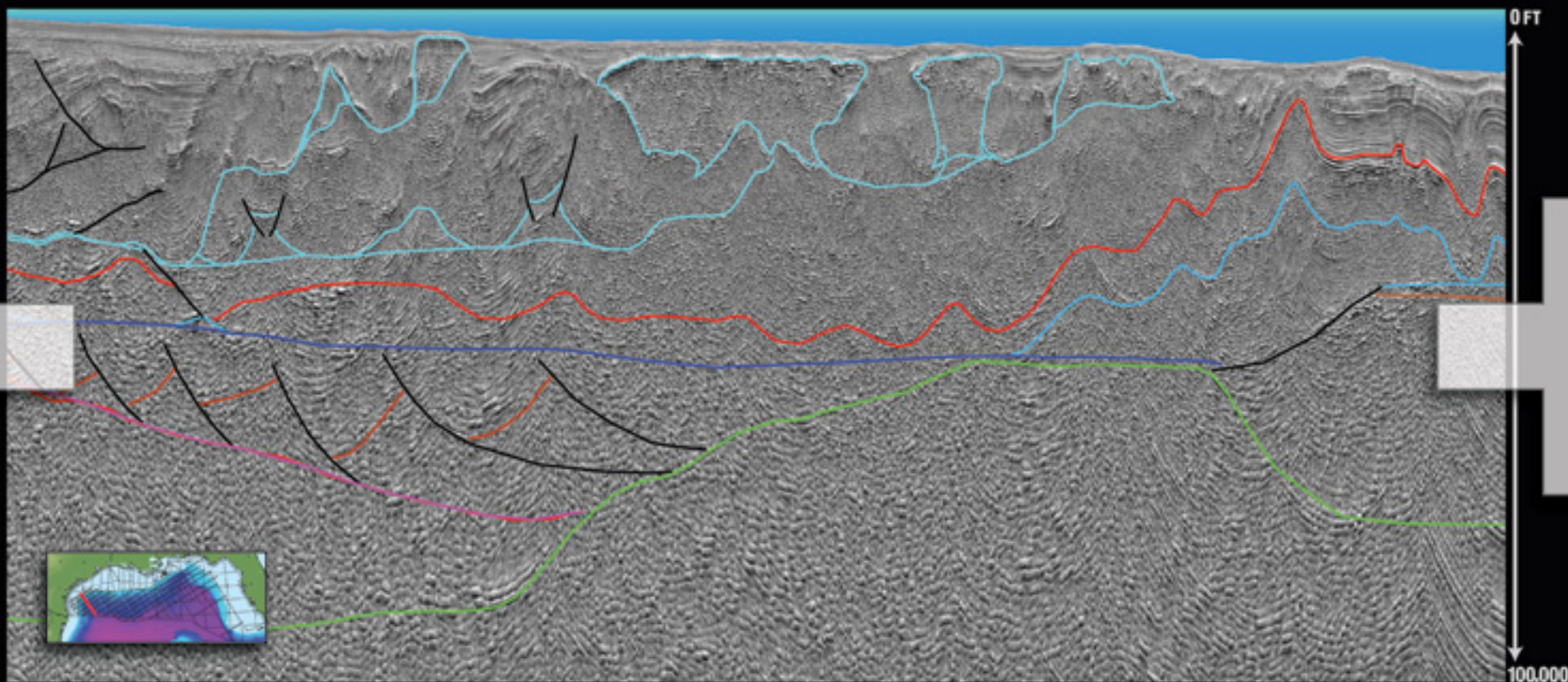
Dalziel's recent geological and geophysical investigations indicate that Antarctica's continental ice sheets may not be thinning as rapidly as satellite images from space have previously measured.

### Back To The Future

Robert Dunbar, one of the expedition's scientific lecturers, is the W.M. Keck Professor of Earth Sciences and the Victoria P. and Roger W. Sant Director of the Earth Systems Program at Stanford University. He's also the J. Frederick and Elizabeth B. Weintz Fellow in Undergraduate Education and a Senior Fellow at the Stanford Woods Institute for the Environment and the Institute for International Studies.

A marine geologist, Dunbar has traveled to Antarctica more than 31 times during the past 30 years. He studies the impacts of climate change – both today and in the geological past – from the tropics to the poles.

Continued on next page



Well imaged low angle crustal detachment, exhumed mantle.

- 10,300 miles covering all deep water Northern Gulf of Mexico protraction areas
- 15 kilometer offsets for better illumination, velocity control and deeper amplitude analysis
- Depth imaged to 131,000 feet (40km)
- Gravity and magnetic data acquired coincident with seismic



# Transformational Impact: One Good Expedition Story Led to Another

By **SUSAN R. EATON**, EXPLORER Correspondent

In January 2012, Justine Wild, age 14, embarked upon an expedition-of-a-lifetime.

Justine, a petite and resourceful ninth grade student from Kamloops, British Columbia, joined 60 other teenagers from around the world crossing the perilous waters of the Drake Passage to the Western Antarctic Peninsula.

My outreach and educational activities (funded in large part by the AAPG Foundation) played a role in Justine's decision to travel to the Bottom of the World; during the past 20 months I've encouraged Justine and others to follow their dreams, and I've provided them with an Antarctic road map to make it happen.

Here's what Royanna Wild, a mining geologist and Justine's mother, said:



Photo courtesy of Justine Wild

Justine Wild (far right) in the Western Antarctic Peninsula, January 2012.

*"My daughter was so moved by Susan's Antarctic presentation, her amazing photos and video clips, that she applied for Students On Ice, a program Susan described during her presentation. Susan is a great role model for youth, especially young women. I'm*

*incredibly thankful to Susan for inspiring my daughter to pursue her passions."*

Since her return from Antarctica in late January, this engaging student has delivered an astonishing number of presentations about her Students On Ice expedition –

she's spoken to 30 individual elementary classrooms; two high school assemblies; one Girl Guide group; and one mining group.

Justine's mother describes the experiential transformation in her daughter as "profound."

Imagine where our careers might have taken us, had we traveled to Antarctica, at age 14, to study glaciology, geology, climate change and ocean change in the planet's greatest outdoor laboratory.

But, it's never too late – whether you're 14, 34 or 64 years old, Antarctica, the world's final frontier, renews the human spirit of exploration and scientific discovery, creating enlightened global citizens who return home with newfound knowledge and hands-on experience. ☒

## Continued from previous page

Specializing in paleoclimate and biogeochemistry, Dunbar runs the Stable Isotope Lab at Stanford University. His research attempts to quantify heat transfer from the warmest to the coldest parts of the planet. Descending in submersible submarines to 2,000 meters in the deep ocean, Dunbar has explored and documented this rarely-seen underwater world – he's made 14 deep dives and has discovered, on average, a couple of new species during each dive.

Dalziel and Dunbar believe that increasing levels of atmospheric CO<sub>2</sub> translate to ocean warming; acting as a huge heat sink, the ocean transports this extra energy to the Antarctic ice shelves and glaciers.

"Heat storage in the ocean comes

from climate change," Dunbar said, noting that Antarctica is warming at a rate that's eight times that of the global average. "When you visit Antarctica, you get a sense of the rate of change that's possible.

Dunbar is a proponent of teaching in the field and "on the ice."

He describes glaciers – and the

icebergs that they spawn – as "equal opportunity transporters" of sediments from the land to the continental shelf.

Most geologists, he said, view turbidite flows as the primary mechanism for offshore sediment transport, but he adds, "I'm always amazed by the transport capabilities of ice."

In order to reconstruct Antarctica's

paleoclimate and to predict future climate change, Dunbar has drilled (and cored) through the Ross Ice Shelf, Earth's largest floating ice shelf. Not only has he drilled through the ice shelf – it's the size of Alaska – but he's drilled through the underlying water column and 1,300 meters into the unconsolidated sea floor sediments that often contain boulders measuring 50 centimeters across.

Dunbar describes this ground-breaking research as "drilling back into the future."

His paleoclimate reconstructions – from ice and sediment cores and from biogeochemistry – show that the Western Antarctic's ice shelves have melted, completely or almost completely, 30 to 40 times during the past three to four million years, precipitating a sea level rise, each time, on the order of six meters. ☒

Various sites provide additional information on Antarctica and Eaton's upcoming expedition:

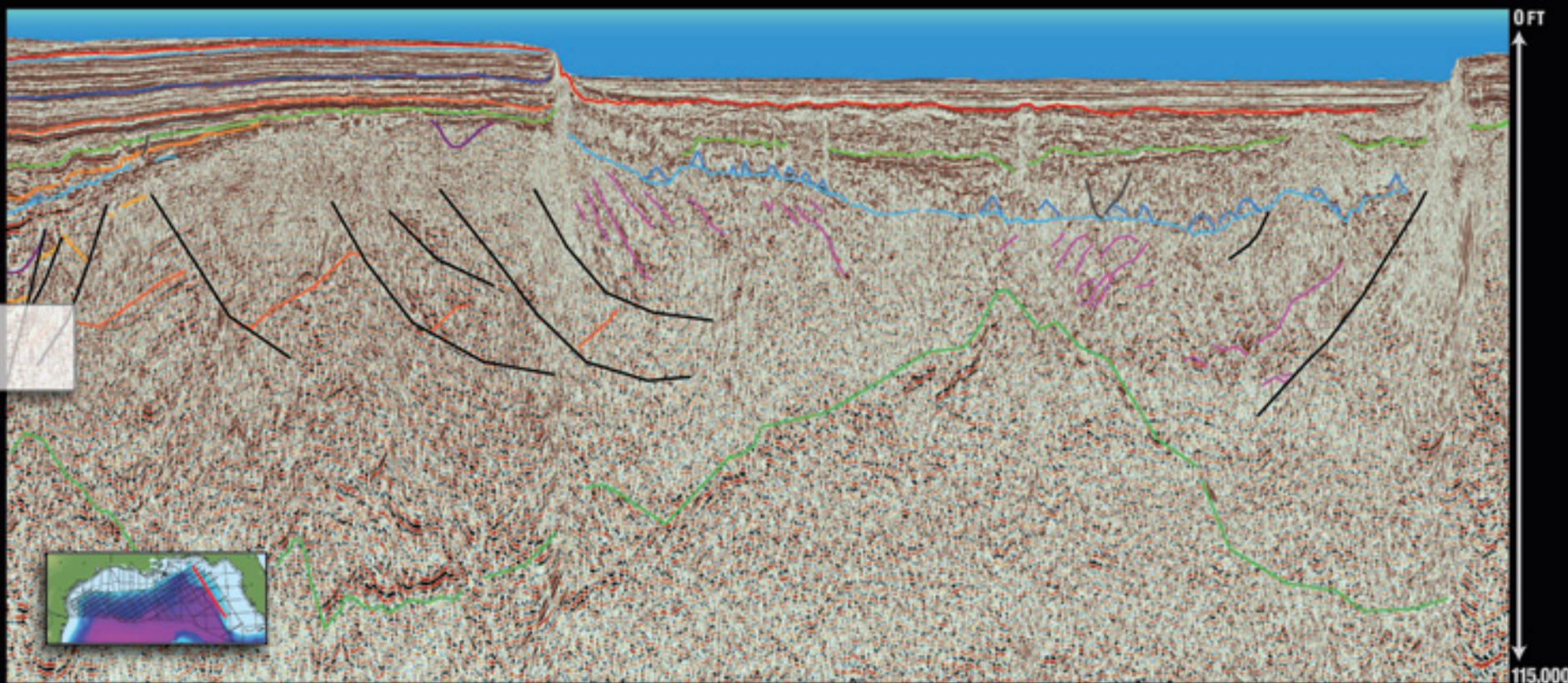
- ✓ Jackson School of Geosciences expedition overview and itinerary: [www.cheesemans.com/antarctica\\_jsg.html](http://www.cheesemans.com/antarctica_jsg.html).
- ✓ Susan R. Eaton's website, Antarctic blog posts and videos:

[www.susanreaton.com](http://www.susanreaton.com).

- ✓ Sharon Mosher's home page: [www.jsg.utexas.edu/researcher/sharon\\_mosher](http://www.jsg.utexas.edu/researcher/sharon_mosher).

- ✓ Ian Dalziel's home page: [www.ig.utexas.edu/people/staff/ian/](http://www.ig.utexas.edu/people/staff/ian/).

- ✓ Rob Dunbar's home page: [dunbar.stanford.edu/dunbar\\_ges.html](http://dunbar.stanford.edu/dunbar_ges.html).



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**Geosteering**  
from page 14

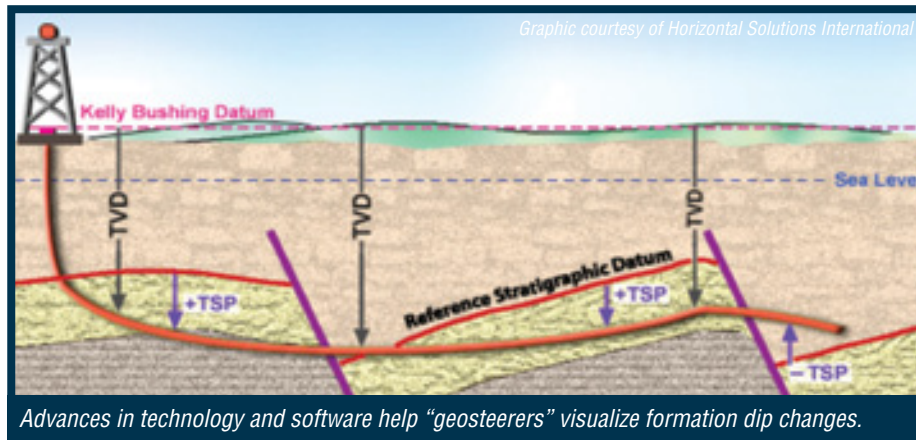
them difficult to interpret or visualize," Slayden said. "The geosteers have software that lets them compress curves into a vertical type log and fit them back into a vertical correlation.

"It helps us by allowing us to visualize formation dip changes," he said. "Even when you go across faults they're able to match you up with where you faulted to, which can be especially difficult.

"In the Woodford, where you have faults that are smaller scale than the 3-D seismic can see, you're not expecting these faults and they can pick them up fairly quickly," Slayden noted.

"It's a tool to visualize where we are in a vertical sense while drilling horizontally."

Besides using this tool in various shales,



XTO also has used it in coalbed methane plays and currently is applying it in some of their sand plays in the Permian Basin.

There is a relatively new trend for a company such as HSI to take on the entire geosteering process for a client. Given

its lengthy history and a bevy of longtime experienced consultants on the roster, the company is often called on to do just that.

Slayden opted to take a different approach.

"My people and HSI both provide an

analysis, but I want our guys to understand and think about where they are without relying on a geosteering company," Slayden noted. "If they don't stop to think where they are, the direction things are moving, they won't know if the geosteering is right or wrong.

"The geosteering company provides us with a second set of eyes looking at the data," he continued. "This provides us with a comfort level that's very important and very valuable.

"It's also a very cost-effective solution."

**Tackling Complex Geology**

Chief Oil & Gas has had myriad occasions to apply the geosteering process in various plays.

They drilled several hundred horizontal wells in the Barnett shale play using HSI personnel, according to Steve Collins, geologist at Chief's Carrollton-based office just outside of Dallas.

He noted that in some areas where they operate, the geology is "calm" so that landing the laterals and staying on target is pretty much a slam-dunk. This is not the case in the Marcellus shale, where Chief has been drilling for about six years.

"In some areas in Pennsylvania, the geology is very complex across some of our leases," Collins noted. "There are very large thrust faults, so landing those laterals and keeping them on our centerline target can be challenging.

"The primary tool we use for geosteering in Pennsylvania is the LWD gamma ray log," he said. "It's great for steering there because you have obvious gamma ray signatures in the Marcellus that can be mapped for miles across counties."

Collins noted they monitor the geosteering, but HSI assumes the principle responsibility for the steering.

"They're part of our geo-team and are very valuable to us," he said. "This frees up our geologists for other duties, so it's very cost efficient, too."

Pre-planning is key to successful geosteering, and Collins offered a concise summary of their approach:

"We acquire 3-D and interpret it, and the lateral is based on this," he said. "We want to go around large thrust faults and areas with high bed dips, and the geophysicist(s) will interpret this along the lateral based on 3-D. This information goes to the geosteerer so he knows what to expect.

"When we start drilling, we use the LWD gamma ray, generally putting it in at kick-off point," Collins continued. "That gamma ray data are periodically transferred to the HSI geosteerer who has the gamma ray data from a nearby pilot hole that drilled vertically through the entire Marcellus section.

"As he's (steering) horizontally with the gamma ray readings, he's interpreting stratigraphically where he is and (the driller) will make adjustments with the bit, going up or down to stay on centerline target.

"On reaching TD, we review the HSI interpretation of where the lateral has landed, what the bed dips were, whether any faults were cut. We take this interpretation and compare to what the geophysicist(s) indicated we would see based on 3-D.

"In the majority of cases, the two have compared very closely. We have a lot of confidence that we know exactly where the lateral has landed along section, where a fault may have been encountered. As we place the frac stages in the Marcellus, we know where to place them.

"The HSI interpretation also helps to determine where not to frac, such as where we cut a fault," he said. "We'll skip across the faulted interval." □

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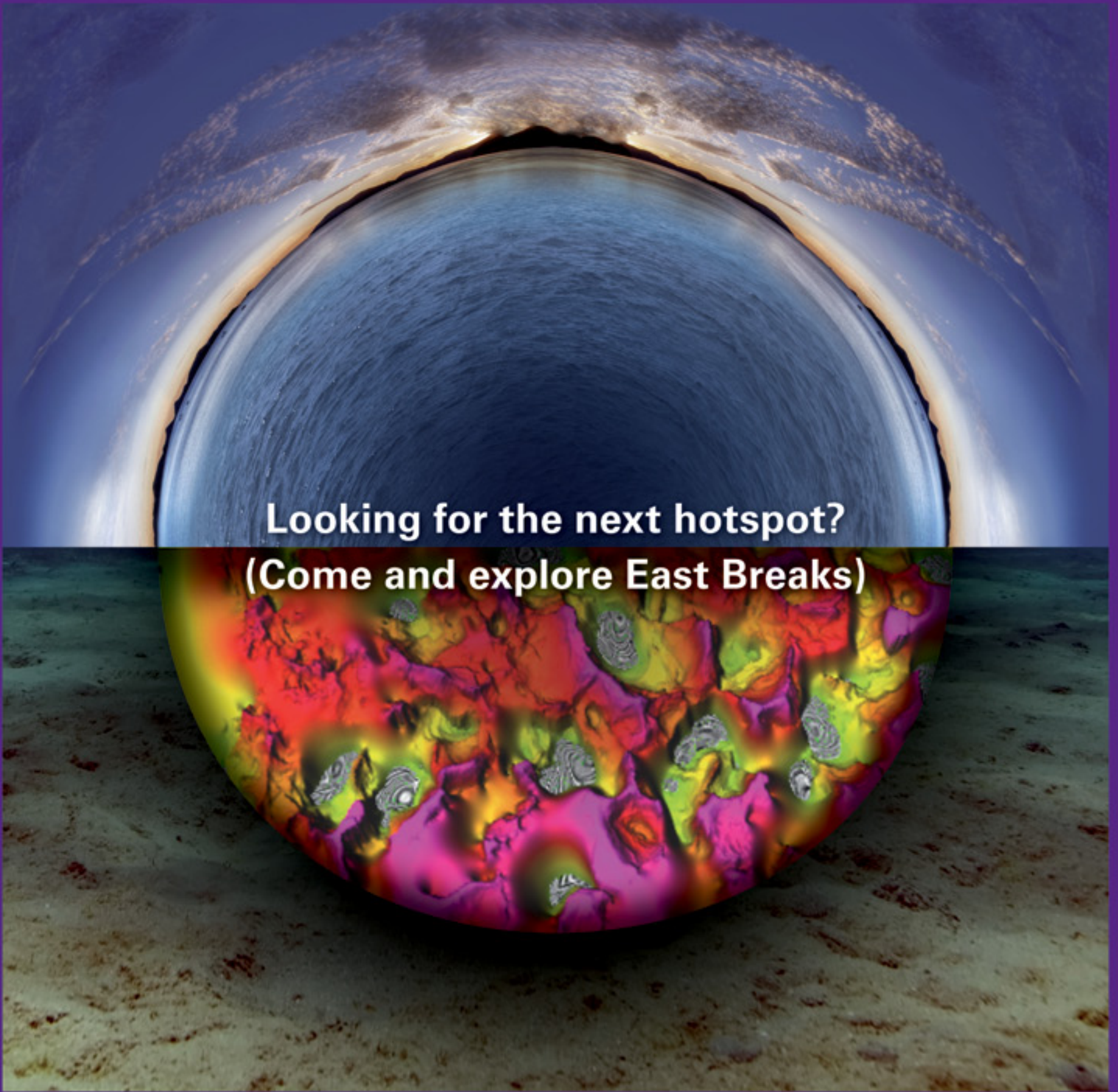
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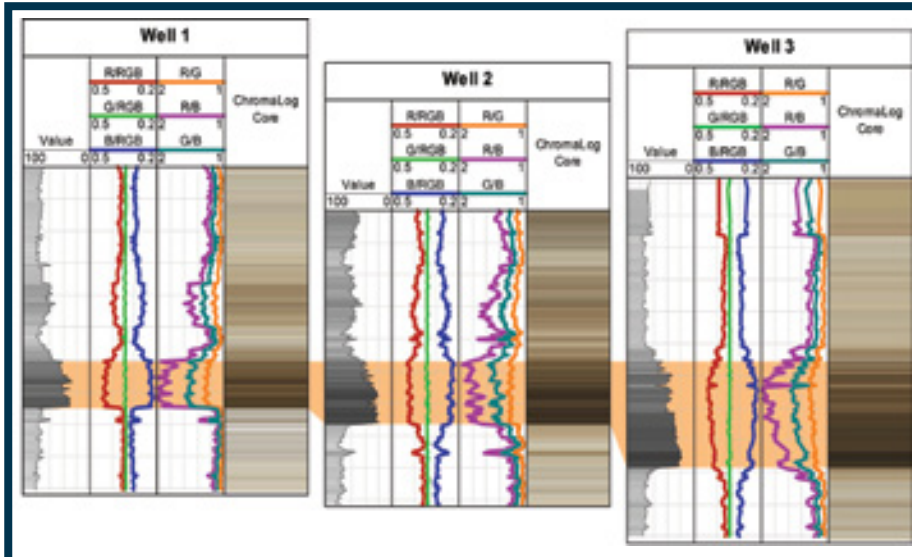


**Colors**  
from page 16

For an example, Ellington mentioned that his company is working with an operator who is moving to a new location in its general operations area and wants to map out a new color chart, basically on the two pilot holes they will be drilling.

“When they go horizontal, their colors will be locked in for the organic event where they like to go horizontal in the Eagle Ford,” he said. “When you’re in a new area you have to create a type well log, just as with an exploration well when you run suites of well logs and create a type well log where you make zonations based on changes, events your well logs will see.

“We’re adding additional data tracks,



Users say that ChromaStratigraphy technology provides additional data points that prove valuable when horizontal wells and geosteering are in use.

creating a type well log for the section by running a Chromalog,” Kneis added. “When you start drilling offset wells, you’ll be able to correlate them to the type log.”

**Steering Toward Success**

Geosteering would seem to be a tool that can benefit significantly from ChromaStratigraphy technology.

“In 90 percent of the wells being drilled now in unconventional resources, people are steering with one data point, and that’s the gamma ray off their pilot or offset wells,” Kneis said. “Where you’re trying to stay in zone on an important well, the Chromalog gives them a second data point that is inflexible.

“We have the color chart already established in the trend, and the color is what it is,” he noted. “The computer sees it and locks the color in and can tell you exactly when you get out of section, whether you’ve faulted up or down.”

Geosteering application is possible because the data analysis can be done close to real time either at the well site or in the lab.

Ellington noted that their chromatic analysis technique also can function as a quickly-available proxy for total organic carbon in addition to its value for stratigraphic identification and correlation.

Besides numerous domestic shale plays and other plays, including overseas, the company is using its technology in legacy wells in the eastern Gulf of Mexico to assist with correlations in conventional reservoirs.

“We can go back and pull samples out of storage that were drilled 20 years ago or whenever,” Kneis said. “Using ChromaStratigraphy, we can create well logs from cuttings on older wells to correlate with new things people are wanting to do.

“We have also taken outcrops like the Eagle Ford and related those back to the subsurface.”

**RMS and Eastern Section Name Levorsen Winners**

Winners of the A.I. Levorsen Award have been announced for two recent AAPG Section meetings.

The Levorsen Award is given to the presenter of the paper judged to be the best at its respective Section meeting.

► For the Eastern Section meeting, held in Cleveland, the Levorsen Award goes to AAPG member Hannes E. Leetaru, with the Illinois State Geological Survey in Champaign, Ill.

His paper was titled “Carbon Capture and Storage and Precambrian Topography in the Illinois Basin.”

His co-author was Robert Finley, also with the Illinois State Geological Survey in Champaign.

► For the Rocky Mountain Section meeting, held in Grand Junction, Colo., the Levorsen Award goes to AAPG member Timothy Nesheim, with the North Dakota Geological Survey in Bismark, N.D.

His paper was titled “Examination of Source Rocks Within the Tyler Formation (Pennsylvanian), North Dakota.”

His co-author was Stephan Nordeng, also with the North Dakota Geological Survey in Bismark.

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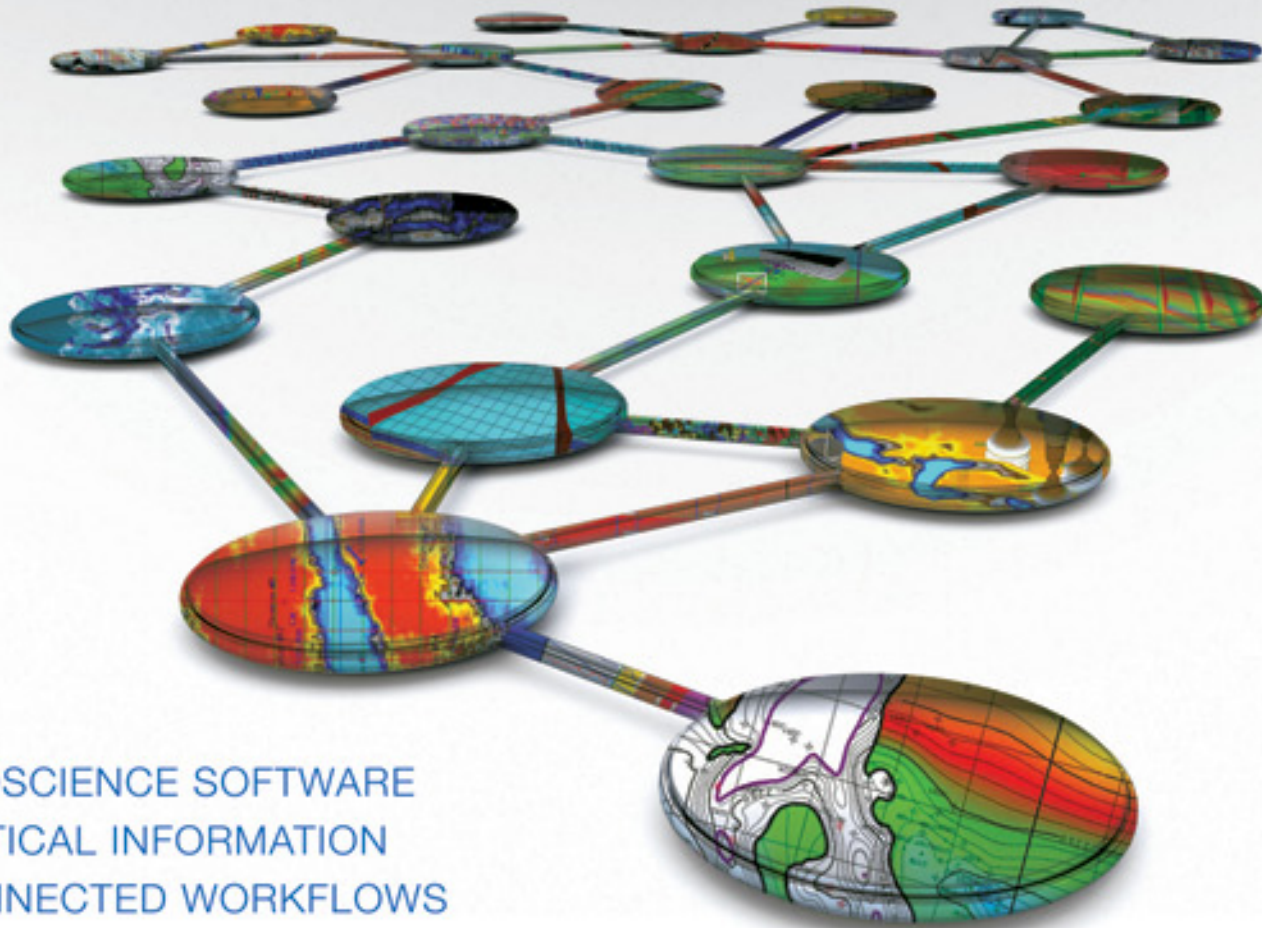
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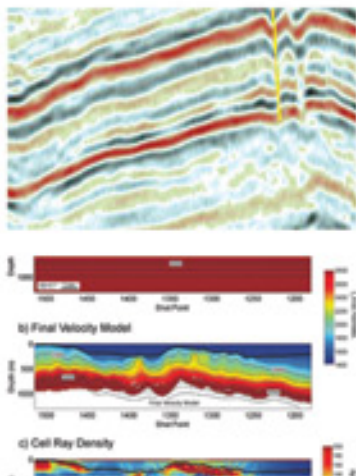
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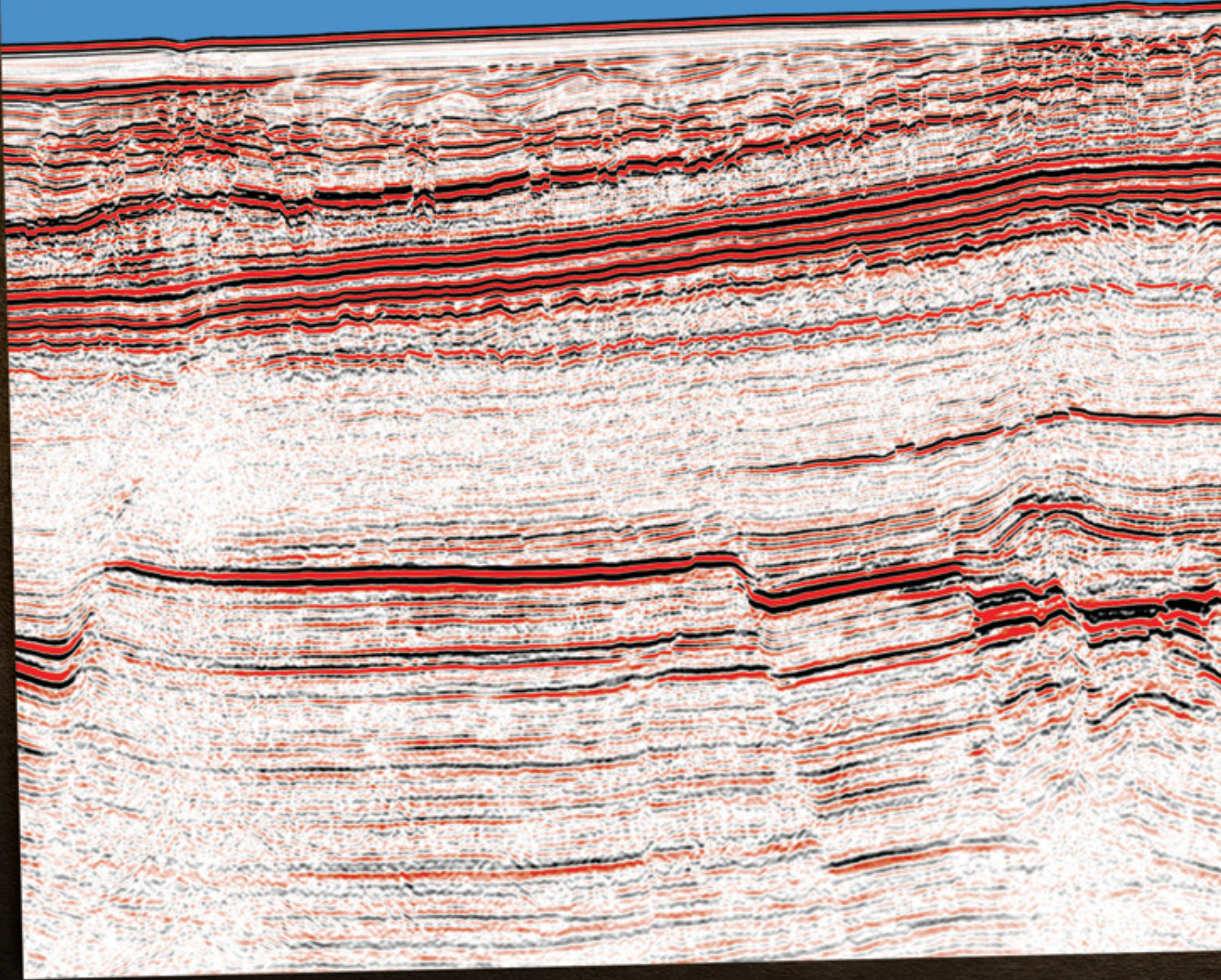
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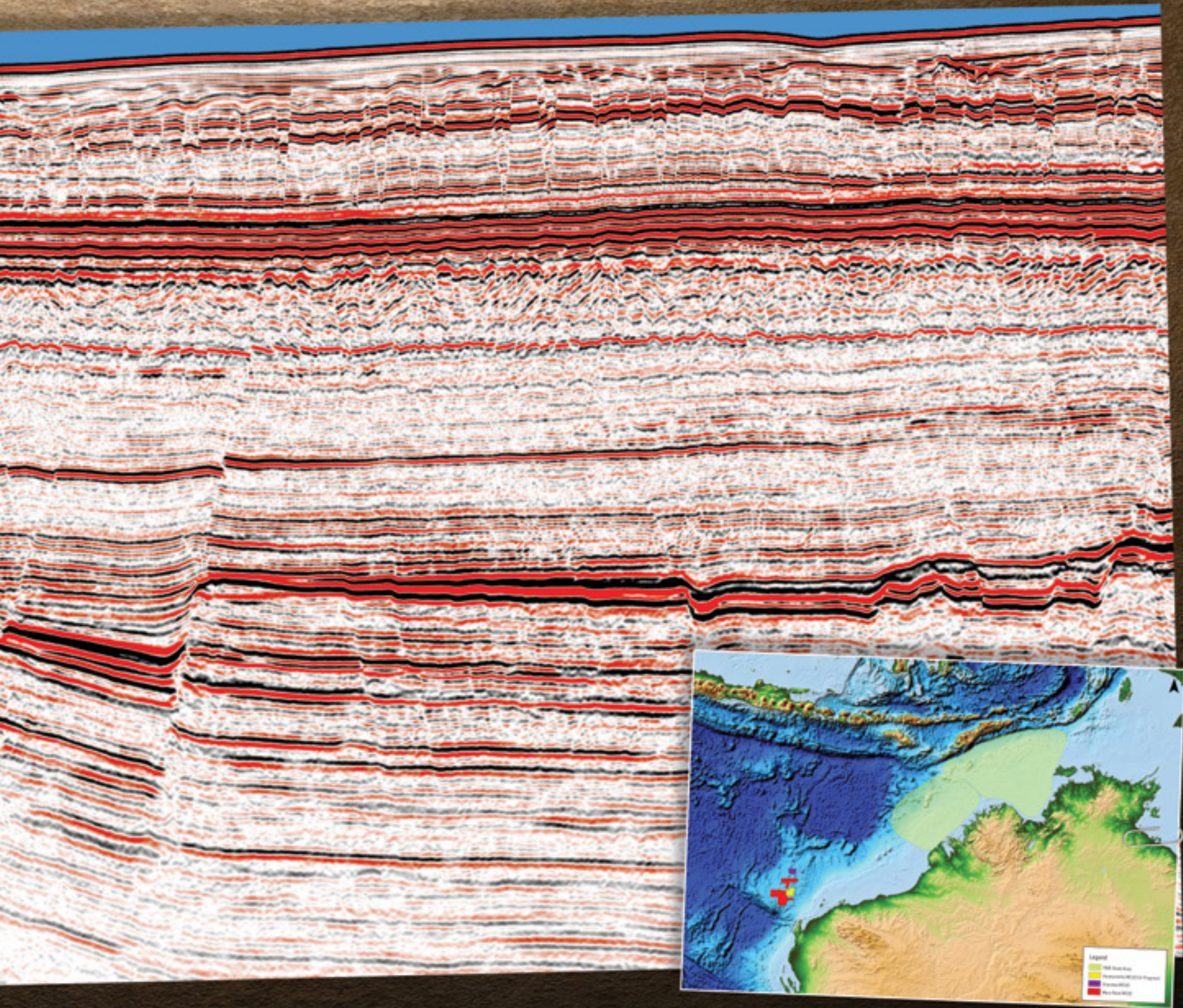
Mary Rose (MR-11) - 8,839 km<sup>2</sup>

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Gerald Friedman again is part of Epstein's life

# NYC Member Stayed – And Survived Sandy

By BARRY FRIEDMAN, EXPLORER Correspondent

**“H**oly #&!@. I lost my cable!”  
For Samuel Epstein, a 32-year AAPG member and delegate for New York state and surrounding areas who resides in an area that was ravaged by nature's horrific forces, that's when he knew the now infamous Hurricane Sandy was serious. (If you're asking yourself, "Only then?" you're not alone.)



EPSTEIN

**“I told the authorities, ‘We’re not going through this again. We’re staying home.’ And the city said, ‘Fine, you want to stay, you’re on your own.’”**

“I’m watching television,” he recalls, “and then ... nothing.”

First, a little history.

Before Epstein's house was turned over to insurance adjusters, he lived in Rockaway Beach in New York, situated on the Rockaway Peninsula in New York City, in the borough of Queens.

It is on the South Shore of Long Island – and in late October it was Sandy's WELCOME mat.

The smart ones residing there evacuated.

Now senior vice president of investments and wealth management adviser for Merrill Lynch, Epstein, who has a master's in geology from Rensselaer Polytechnic Institute – that connection matters to this story – had been a senior petroleum geologist for Cities Service Oil and Gas and Getty Oil.

He also is president of Geoval Consultants in New York City, and executive director/consultant to Touro College regarding its Department of Earth and Environmental Studies.

He also has had more than 27 publications in referenced scientific journals concerning petroleum exploration, production and – wait for it – in the September 2007 issue of the Journal of Carbonates and Evaporites, the effects of global warming on sea level changes.

He knows, he knows ...

So why didn't he evacuate when he heard the warnings of Sandy's fast-approaching arrival?

He laughs about it now (sort of).

Two words: Irene and stubbornness. “Previous experience worked against me,” he said from his cellphone, weeks after the event, as he waits, yes, for the cable guy.

“Look,” he says, only a bit defensively. “I had lived through Hurricane Irene. They told us to leave. We (he and his wife, Peggy) did – we spent two nights in a hotel in Manhattan, but the storm was a dud. It was a non-event; so when they told us again to leave days before Sandy,

I said, ‘#\*&^ that!’”

To talk to Epstein is to feel like you're talking to Bobby Bacala from The Sopranos; he's funny, acerbic, laughs loud and grew up on the lower East Side of Manhattan Island.

“We had no heat, tenement lifestyle ... Far from the masses, far from the elitists,” he says of his childhood.

He talks of it with warmth and fondness.

This too: he's a devoted Jew, fluid in the Talmud, the text of Jewish law.

All of that plays into this story, too; all of that changed.

### Lost In the Flood

Epstein doesn't scare easily, so when authorities told him to leave, he told them where they could put their evacuation.

A mistake.

“So what happened,” he says, his accent as thick as a corned beef sandwich from NYC's famed Carnegie

Deli, “is I told Peggy, I told the authorities, ‘We're not going through this again. We're staying home.’ And the city said, ‘Fine, you want to stay, you're on your own.’ Then, they evacuated, but not before saying, ‘Do not, DO NOT, call us. We're not coming for you.’”

Hours later, he saw the barometric pressure at 940 mb, a number he had never seen before.

“This wasn't good.”

And the bridge off the island was closed – nobody in or out – and a crazy storm was coming.

“Yeah, I had been watching the Weather Channel, but when I saw that reading, I knew I had miscalculated.”

Then, the power went out and I thought to myself, ‘Now, pal, you're &\$@%#^.’”

The storm started to howl, and he started thinking of Bruce Springsteen's “I'm on Fire:”

*“At night I wake up with the sheets soaking wet/*

*And a freight train running through the Middle of my head”*

He felt that train – and he saw the ocean coming down the street, so he went down to his basement to check the conditions. His Anderson Windows held, he says, but water was coming in from ... the walls.

See Sandy, page 30

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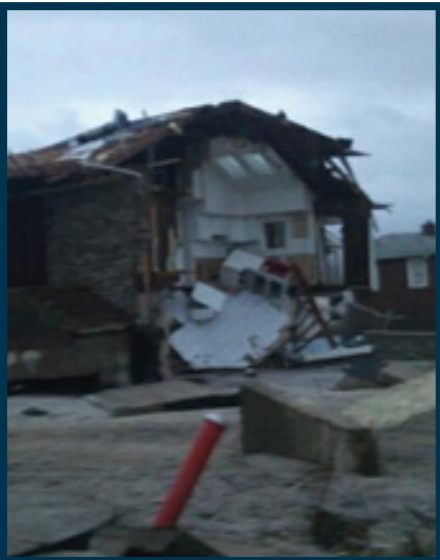
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Epstein's neighborhood: The damage that Hurricane Sandy wrought was devastating.

## Sandy from page 28

It was all gone. Numerous amounts of priceless maps, first edition books and, worse, work he did with his old friend, his mentor from RPI, the late Gerald Friedman. Friedman, whom Epstein calls the father of geology in Israel, brought Epstein into geology, brought him to Israel to work in the Eliat. He gave the eulogy when Friedman died, and now their work together – papers, research, maps, charts – was floating like fish in a bowl. "He molded me," Epstein says of his mentor. The more he slogged around the basement, the more he saw what was no more.

"The full collection of Talmud," Epstein says of the text of Jewish law he owned. "There were treasures, too. Gone."

He takes a breath. And then like a fighter shaking off a bad round, Epstein comes out, swinging.

"But it's irrelevant. It's gone, it's gone."

He made his way upstairs; Peggy was still downstairs, hoping to grab a valuable flash drive, when the water burst through the back door.

"The door came at her like a surf board," he said.

They moved upstairs.

"If it's a hurricane during full moon, it's a perfect storm."

This was perfect.

From their bedroom window, they could see living room furniture and cars going



FRIEDMAN

by on the street below. Twelve-foot waves were breaking against houses.

"If I die," I thought, "I'm going to die," says the man who lived through both attacks on the World Trade Center – he was in the building both times, 1993 and 2001.

Both times he made his way out. There was no way out, only up, and he didn't want to go.

"I didn't want to go into the attic. There were no windows, I didn't want to box myself in. The house, the sky, the island was rocking.

"I told my wife it would stop by nine. It has to."

It didn't.

Not until midnight.

Somehow, he fell asleep, at around three that morning. When he looked out the next morning, he saw a NO STANDING sign covered in water. It was 13 feet tall.

He made his way outside. A refrigerator was floating by; his two cars were underwater.

It was just day one.

### The Ties That Bind

The next days were a blur. No power, no heat, no cable.

"No cable, no reason to live, right?" he asks.

There was no telephone service, no Chinese delivery.

But then his cell rang.

As if out of a movie, it was Gerald Friedman's daughter, Judy Rosen, who lives in Forest Hills, N.Y., which is farther inland.

Before the hurricane even arrived she had asked if he needed a place to stay.

Now, he needed a place, period. His house was full of sand and ocean and floating memories – and the Friedman family once again was about to be an important part of his life.

Epstein's son was able to get through to Sam and Peggy's house, put them in his car and drove them to the Rosen's residence – where they stayed for a week.

As far as the Rosen's were concerned, they could have stayed for a year.

"It's the kind of people they are," Epstein says of Stuart and Judy Rosen.

"There were 14 people in their household for seven days," says the man who, once again, recalled the tenement on the east side of Manhattan and all the families living together, also out of necessity.

Of both times, he says, "it was beautiful."

### Epilogue

Epstein has moved to Brooklyn, where he'll likely be for at least a year.

And sure, he regrets not leaving when he had the chance – but he maintains, "Previous experience worked against me."

And that article on sea level change that he wrote for the 2007 Journal of Carbonates and Evaporites? He plans on writing an update.

But for now, Peggy is safe, his friends, his three children, two grandchildren – all safe.

Something else is, too.

"Did you hear?" he asks. "A guy on Rockaway had a Torah that washed away. They found it two hours later two blocks away in a swimming pool."

And then he laughs. You can hear him smile.

He has to go.

The cable guy has arrived. ☒

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**WASHINGTON WATCH**

# The Year That Was(n't) – D.C. Action Was Rare

By EDITH ALLISON, GEO-DC Director

The 112th Congress (January 2011 to January 2013) has passed little legislation – in fact, it set a record for inactivity, and no bills impacting petroleum exploration and production have been passed.

A few pieces of legislation, however, have passed either the Senate or the House and could be resurrected in the lame-duck session, starting after the Nov. 6 election, or could be reintroduced in the 113th Congress in 2013.

A look at what has been accomplished so far in the 112th Congress is revealing:

- ▶ Slightly over 10,000 bills have been



ALLISON

**At least some of the bills introduced into the 112th Congress are likely to be reintroduced in the future and some may become law.**

introduced.

- ▶ Twenty-five bills relating to oil and gas exploration and production have been introduced, but none have passed both

houses of Congress.

- ▶ One hundred seventy nine bills have passed both houses of Congress and been signed into law by the president. That

total represents less than 2 percent of bills introduced.

- ▶ Of those 179, 21 percent were to rename a federal building.

- ▶ In comparison, the 110th Congress, which introduced a record 14,000 bills, passed 460, or 3.3 percent, of which 32 percent renamed a federal building.

This lack of accomplishment, according to most pundits and citizens, reflects a body that is highly polarized and that lacks a large cadre of members committed to compromise. Given the historic inaction, Congress is unlikely to pass any energy bills in the lame-duck session, between the Nov. 6 elections and when the next Congress starts on Jan. 3, 2013.

\* \* \*

What follows is a summary of oil and gas exploration and production legislation that was introduced into the 112th Congress. This serves as not only a history lesson, but a predictive tool.

At least some of the bills introduced into the 112th Congress are likely to be reintroduced in the future and some may become law.

- ▶ Many bills were introduced while a controversial issue was in the news. For example, in the first year of the 112th Congress bills were introduced in both the House (H.R.1084) and Senate (S. 587) to repeal the oil industry exemption to the Safe Drinking Water Act and require that companies disclose the chemicals used in hydraulic fracturing. This was when the movie "Gasland" had recently come out and fracking with a "k" had just entered the popular lexicon.

Both bills have been ignored by Congress since they were introduced in early 2011.

- ▶ In May 2012 the Bureau of Land Management announced draft regulations that would require proof of wellbore integrity (a cement bond log) before a well on federal land could be hydraulically fractured. This action stimulated the introduction of a suite of bills that would allow states to regulate wells on federal lands:

- ✓ H.R. 4322, to clarify that a state has the sole authority to regulate hydraulic fracturing on federal land within the boundaries of the state.

- ✓ H.R. 6235, Federal Lands Energy Regulatory Certainty Act of 2012.

- ✓ S. 2248, Fracturing Regulations are Effective in State Hands Act.

None of these bills has made it to the first step of a committee hearing.

- ▶ Of 25 oil and gas exploration and production bills introduced, 14 of the bills would require the government to increase leasing of federal lands, onshore and offshore, and Native American lands.

For example, H.R. 1230, Restarting American Offshore Leasing Now Act, would require a lease sale of lands offshore Virginia, and H.R. 4301, the Energy Exploration and Production to Achieve National Demand Act, would repeal the drilling moratorium in the eastern Gulf of Mexico. H.R. 1231, Reversing President Obama's Offshore Moratorium Act, would require lease sales in the Atlantic Ocean,

See Washington, page 34

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## Save the Date: Congressional Visits Day Set for April 15-17

**A**APG has tentatively scheduled its next Congressional Visits Day (CVD) for April 15-17.

CVD provides an opportunity for AAPG members to discuss petroleum science and energy issues with decision makers in the legislative and executive branches of the federal government. It also is an exciting introduction to the world of politics that will provide you with tools to use at the local and state levels once you return home.

AAPG staff will schedule the meetings, as well as provide training

and briefing materials.

CVD will start with an afternoon briefing on how Congress works and the legislative process; ways to make your visits successful; and issues that are of concern to Washington. The second day will be devoted to small-group visits to executive branch offices, and the third day will be devoted to small-group visits to congressional offices.

For more information, contact Edith Allison, AAPG's GEO-DC director, at [eallison@aapg.org](mailto:eallison@aapg.org).

## Washington from page 32

Pacific Ocean and eastern Gulf of Mexico.

Legislation to open the eastern Gulf of Mexico has been introduced in the past but has never gained much traction, perhaps because the citizens of Florida, regardless of their political affiliations, oppose drilling close to their shores.

▶ Several of the bills impacting leasing apply specifically to Alaska federal lands and waters. For example, H.R. 2150, the National Petroleum Reserve Alaska (NPR-A) Access Act, would require:

- ✓ At least one lease sale per year in NPR-A.
- ✓ Timely development of surface infrastructure to support oil production.

✓ A resource assessment of NPR-A by the U.S. Geological Survey.

This bill reflects another common theme in energy legislation introduced over the years: A government assessment of the undiscovered resource is required on the assumption that the information will stimulate or accelerate development.

The value of this requirement is dubious. Resource assessments of the 1002 Area of the Arctic National Wildlife Refuge and the Atlantic Outer Continental Shelf have not stimulated new leasing.

▶ Three of the energy bills specify actions to improve the federal permitting process. For example, H.R. 4383, Streamlining Permitting of American Energy Act of 2012; H.R. 945, Streamlining America's Various Energy Needs Act; and H.R. 1115, Streamlining America's Various Energy Needs Act, would have federal agencies expedite their permit approval process.

▶ Finally, several bills were introduced and one passed (H.R. 3765, Temporary Payroll Tax Cut Continuation Act of 2011, Public Law 112-78) to force the president to quickly approve the application for the Keystone XL pipeline from Canada to Texas. The president did not approve the initial application, but the pipeline permitting process is continuing – haltingly.

Although the controversy continues and is extensively covered by the news media, the issue has not generated any legislation since December 2011. ☐



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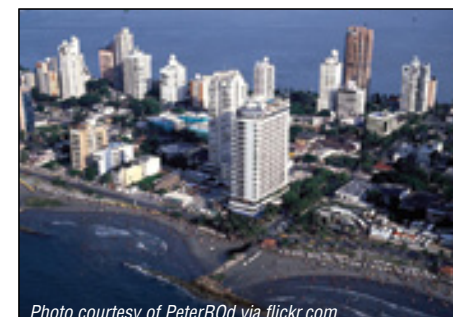


Photo courtesy of PeterROD via flickr.com

## Call for Papers Remains Open For Cartagena ICE

**T**he call for papers remains open for the next AAPG International Conference and Exhibition, which will be held Sept. 8-11 in Cartagena, Colombia.

The meeting theme is "Energy for Integration and Prosperity." Victor Vega, with Equion Energia Ltd., in Bogota, D.C., Colombia, is the general chair.

The technical program will feature six main themes. They are:

- ▶ Latin American Basins and Petroleum Systems.
- ▶ Unconventional Resources.
- ▶ Challenges in Heavy Oil.
- ▶ Mature Fields.
- ▶ Deep Water Exploration and Production.
- ▶ Environmental Geology.

In addition to these will be a "special session" on the History of Petroleum Geology, chaired by Hans Kraus – editor of the EXPLORER's monthly "Historical Highlights" column – and Daniel Truempy.

The deadline for abstract submittal is Jan. 18.

To submit an abstract, or for more information on ICE 2013, go to [www.aapg.org/cartagena2013](http://www.aapg.org/cartagena2013). ☐

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# A Solid Step Toward Accurate Interpretations

By SATINDER CHOPRA and RITESH KUMAR SHARMA

In last month's Geophysical Corner we discussed the unsupervised seismic waveform classification method, which provides qualitative information on lithology in terms of facies variation in a given subsurface target zone.



CHOPRA

While this information is useful, more work needs to be done for characterizing such formations of interest in terms of porosity and fluid content. For this purpose, impedance inversion of seismic data could be used, which essentially means transforming seismic amplitudes into impedance values.

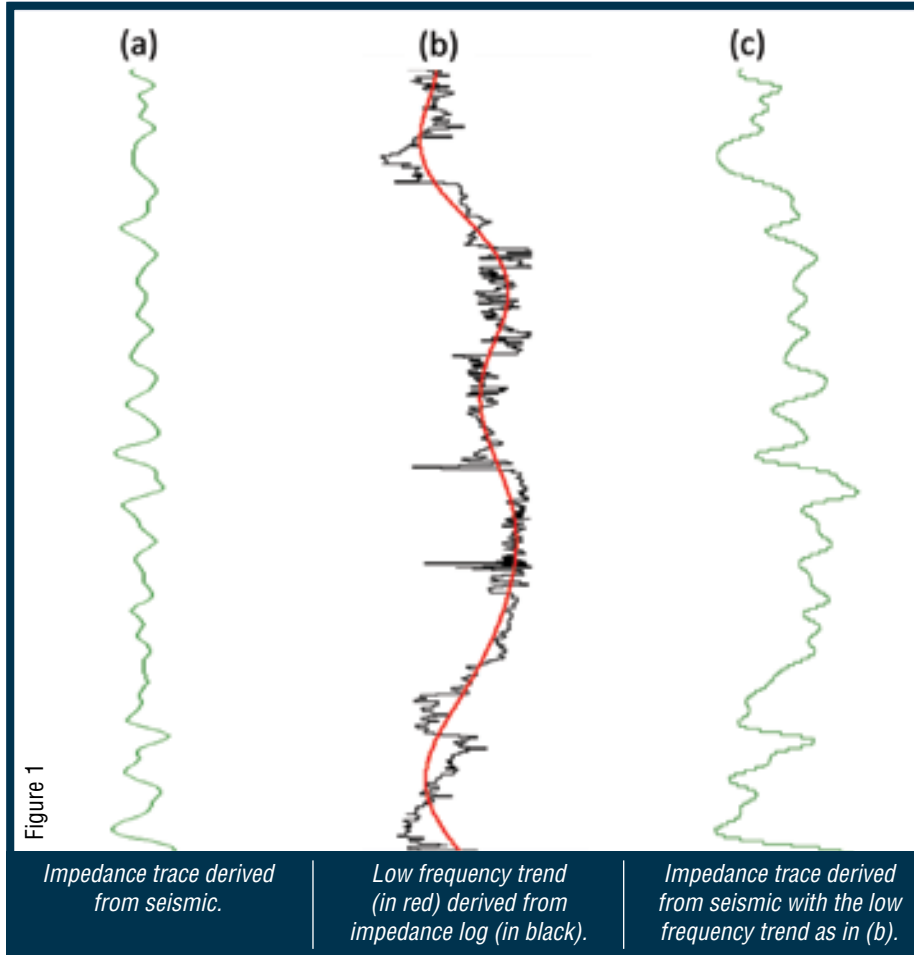


SHARMA

This month we discuss here such impedance characterization of the formations of interest.

\* \* \*

Seismic signals have a narrow frequency bandwidth, say 8-80 Hz. Frequencies below 8 or 10 Hz are lost either by bandpass filtering circuits in the recording instruments or while processing of seismic data to eliminate the low frequency noise usually present in the data.



Impedance trace derived from seismic.

Low frequency trend (in red) derived from impedance log (in black).

Impedance trace derived from seismic with the low frequency trend as in (b).

Sonic logs, on the other hand, have a very broad frequency bandwidth, extending from 0 to well over many kilohertz.

While the high frequencies show the high-resolution information on the log, the low frequencies exhibit the basic velocity

structure or the subsurface compaction trend. As these low frequencies are not present in the seismic data, the impedance traces derived from the seismic do not exhibit the compaction trend that the impedance logs do.

When seismic data are transformed into impedance values, the low frequency trend usually is added from outside – say, from the available impedance logs. By doing so, the derived impedance values will have a range of values similar to the value range exhibited by the impedance log curves.

Such a method is termed as absolute acoustic impedance inversion.

In figure 1, the addition of the low-frequency trend is demonstrated to the inverted impedance trace from seismic.

Sometimes it is not possible to determine the low frequency trend accurately, which possibly could be due to the unavailability of the log data. In such cases, the derived impedance range will be devoid of the compaction trend, but would still exhibit the relative variation of the impedance values.

Such a method is termed as relative acoustic impedance inversion.

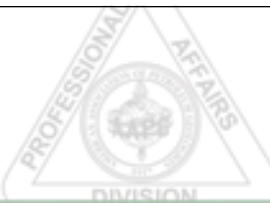
\* \* \*

In the last Geophysical Corner we discussed the seismic waveform classification method for describing the facies variation of Middle Jurassic Doig sandstones in Western Canada. We

Continued on next page

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Finding oil and natural gas requires leveraging science and creativity to identify prospects and employing work flows to minimize risk and maximize chances for success. Attendees will:

1. Gain improved understanding of scientific and commercial requirements for successful prospect generation;
2. Improve communications and interaction with prospective stakeholders; and
3. Ensure the highest degree of professionalism and ethics in their professional activities.

**Program:** Morning sessions: Educational talks on how to package and screen deals, the "art of exploration" and perfecting prospecting workflows.

Networking Lunch will be followed by: Keynote speech by Mr. Harold Hamm, CEO of Continental Resources, Changing the game in the Bakken /Woodford.

Afternoon sessions: Examples of hot and emerging Plays (Bakken, Woodford, Marcellus, Eagle Ford, Mississippian Lime, Utica, Eagle Bine, more).

**Who should attend:** geoscientists, land men, engineers, entrepreneurs, investment bankers.

### SPEAKERS INCLUDE:

Harold Hamm, Domestic Energy: Bakken and Woodford  
 Richard Stoneburner, Unconventional Play Fundamentals, AAPG Distinguished Lecture  
 Bill Zagorski, New Insights on Liquid Rich Marcellus, AAPG Outstanding Explorer of the Year  
 Bill Maloney, Ideas to Profits: Creative Entry Into Successful Plays

Charles Sternbach, Playmaker Program, DPA President  
 Dan Tearpock, 10 Habits Highly Successful Oil Finders  
 Ted Beaumont, Exploration Creativity, AAPG President  
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 Steve Bachman, Assembling and Presenting Conventional Prospects  
 Charles Cusack, Eagle Ford Discoveries, GCAGS Award Winning Paper  
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**Continued from previous page**

pick up the same example to determine the changes of impedance in the Doig sandstones in a lateral sense, which would be reflective of the porosity changes.

In figure 2a we show a horizon slice from the relative acoustic impedance volume derived from the input data volume. Within the sand boundary (in black), there are variations in impedance.

We also computed the absolute acoustic impedance on the same volume, which is shown in figure 2b. Though the overall impedance pattern still appears more-or-less the same, there is a significant variation in the impedance (red color) within the sand boundary.


\* \* \*

The May 2008 Geophysical Corner described a thin-bed reflectivity inversion method that outputs a reflectivity series –and demonstrates that the apparent resolution of the inversion output is superior to the resolution of the input seismic data used to generate the reflectivity response. This aspect makes the method ideal for detailed delineation and characterization of thin reservoirs.

We derived the reflectivity from the seismic data used for generating the impedance displays in figure 2, and then generated relative acoustic impedance from it. The result is shown in figure 3, where the impedance variation exhibits a pattern that is more focused than the impedance variation in figure 2a and similar to that in 2b – but superior.

The main reason for this is probably the absence of the seismic wavelet in the data used to derive the relative acoustic impedance in figure 3.

Impedance inversion on highly resolved seismic data retrieved in the form of reflectivity is useful for making accurate interpretations, and so proves advantageous.

We thank Arcis Seismic Solutions for permission to present this work. 

*Editor's note: Chopra and Sharma are both with Arcis Seismic Solutions, Calgary, Canada.*


**Call for Papers Issued for IPTC '14**

The call for papers has been issued for the seventh International Petroleum Technology Conference, set Jan. 20-22, 2014, in Doha, Qatar.

The theme for the multi-society event will be "Unlocking Energy Through Innovation, Technology and Capability." IPTCs are sponsored by AAPG, SEG, SPE and EAGE, rotating yearly between Doha and the Asia Pacific region. The 2013 IPTC will be held March 26-28 in Beijing, China.

Proposed technical topics are:

- ▶ E&P Geoscience Challenges.
- ▶ Reservoir.
- ▶ Drilling and Completion.
- ▶ Production and Operations.
- ▶ Engineering Projects and Facilities.
- ▶ Field Development.
- ▶ Mid-Stream Gas.
- ▶ Over-Arching Industry Issues – HSE, Security, Human Resources, Business and Social Challenges.

The call for papers deadline is April 12. To submit an abstract, or for more information, go to [iptcnet.org](http://iptcnet.org). 

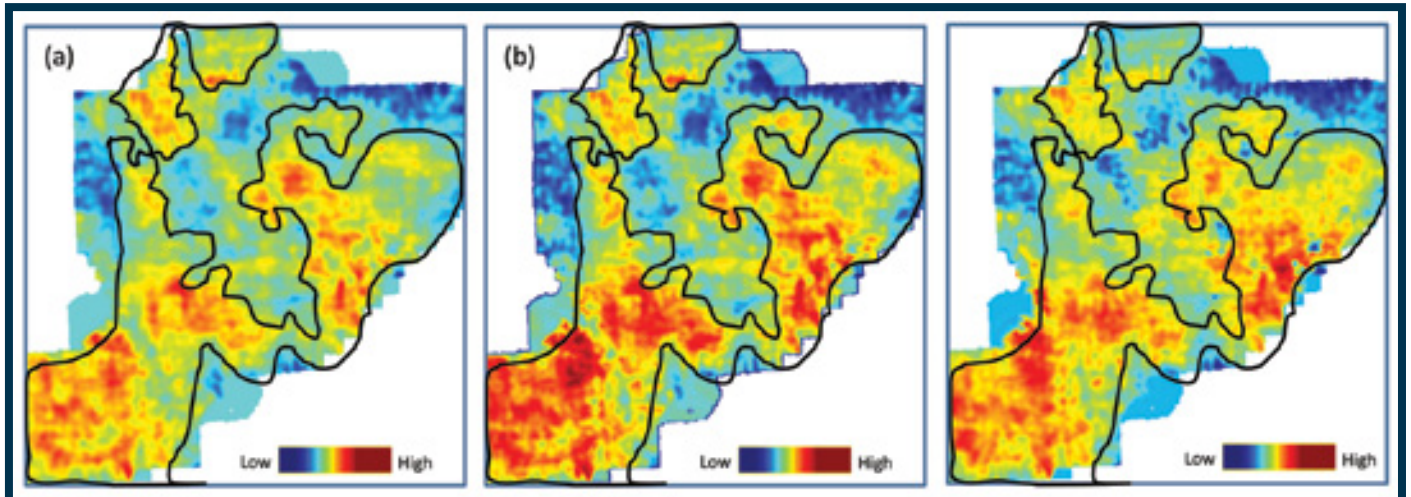
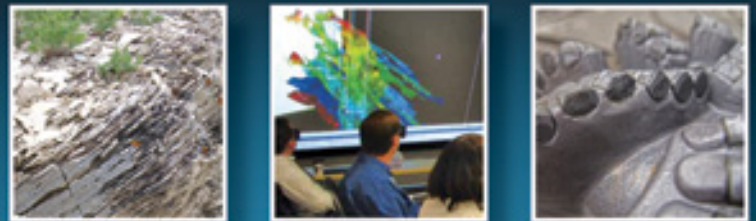


Figure 2 – Horizon slice through the (a) relative acoustic impedance volume (b) absolute acoustic impedance volume passing through the Doig sandstone.

Figure 3 – Equivalent horizon slice to that of figure 2, through the relative acoustic impedance volume generated from thin-bed reflectivity derived from the input seismic volume.

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- Theme 17: Completion Optimization
- Theme 18: Rock Mechanics
- Theme 19: 3-D Seismic Applications
- Theme 20: Health, Safety and Environmental Issues



# Entrepreneurs Finished the Falklands' Story

By PHIL RICHARDS

Exploration success in the harsh waters around the Falkland Islands – a self-governing British Overseas Territory disputed by neighboring Argentina – has taken considerable time to achieve, but is now starting to prove to have been worth the wait.

With just 22 wells drilled and seven discoveries made during the latest drilling campaign since early 2010, the Islands' oil potential has been transformed from the nadir days of the 1998 oil price crash, which saw the likes of Shell, Amerada Hess, Teikoku, Murphy, Fina and Lasmo withdraw from the area after drilling just six holes with various shows but no discoveries.

When the Falkland Islands government launched its first – and to date, only – competitive licensing round in 1995, only the relatively shallow water blocks to the north of the Islands, in less than 500 meters of water, were deemed to be either attractive enough or technically feasible to explore. Shell, Hess and Lasmo, with their associated partners of the time, took the lion's share of the more attractive acreage, amidst relatively fierce competition for the perceived prized blocks (see figure 1).

Remember, this was in an era when the large and mid-sized companies still engaged in wildcat exploration of frontier areas!

A couple of entrepreneurs, with disparate reasons for having business interests in the Islands, also entered the game at this stage, and with several more like-minded individuals who were to follow them in

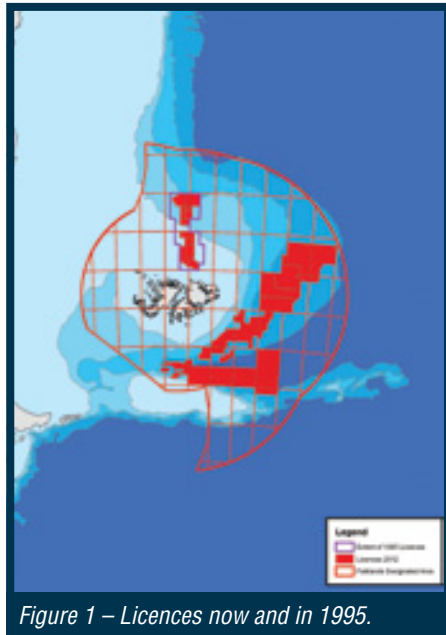


Figure 1 – Licences now and in 1995.

subsequent years changed the path of exploration in the region and led eventually to the present brink of production that the Islands now anticipate.

## Phipps Finds the Potential

Typical of the early entrepreneurs was the late Colin Phipps, a petroleum geologist who had built Clyde Petroleum from a small consulting company in the 1970s to one of the United Kingdom's largest and most successful independents.

Phipps also was once a Member of the



Photo courtesy of Norman Clarke

Figure 2 – Colin Phipps, center, with other oil company representatives in the government offices in Stanley, Falkland Islands, 2007. From left: Bruce Ferrar, Howard Obee (both Borders and Southern Petroleum); John Hogan (Argos Resources), Lewis Clifton, Ian Duncan and Colin Phipps (all Desire Petroleum); Sam Moody (Rockhopper); Tim Bushell (Falkland Oil and Gas Ltd); David Bodecott (Rockhopper); Stephen Luxton (ex FOGL, now director, Falkland Islands Mineral Resources); and Stephen Phipps (Desire Petroleum).

British Parliament, and as a backbench MP in the 1970s had traveled to the Falklands and Argentina on a Parliamentary fact-finding mission, partly to investigate attitudes around what he perceived to be "deeply entrenched and persistent folklore in the Falklands that the Islands are underlain and surrounded by vast accumulations of oil."

Phipps' own 1977 geological analysis of the potential was that it was immediately obvious that "there has been remarkably little geological work of any kind carried out in the Islands."

And there things laid, and possibly might have stayed, until he came along to a lecture that I presented to the Petroleum Exploration Society of Great Britain in 1993 in an attempt to promote early exploration of the region.

Phipps rekindled his interest in the Islands and successfully applied for all the less attractive acreage around the periphery of the highly prized northern basin, knowing that no government in those days would lease its most attractive acreage to a

See [Falklands](#), page 40

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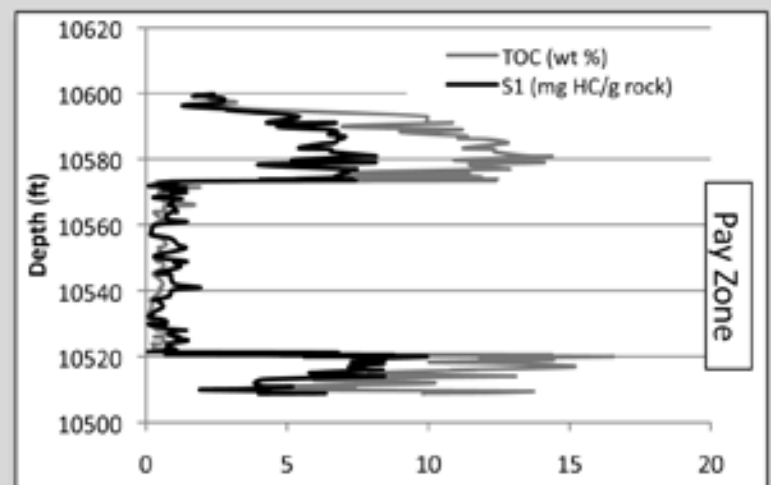
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**Article highlights include:**

**Porewater mass transport**

*Knut Bjørlykke and Jens Jahren*



When meteoric water is absent, sedimentary rocks represent geochemically closed systems during burial diagenesis. Diagenetic reactions are geochemically balanced, and rock properties can be predicted based on primary mineral composition and burial history.

**Fracturing and structural evolution**

*Alec Duncan, Catherine Hanks, Wesley K. Wallace, Paul B. O'Sullivan, and Thomas M. Paris*



This study documents changes in the character, geometry, and distribution of map-scale structures and fractures in the central Brooks Range fold and thrust belt. These changes may provide important clues to the evolution of the central Brooks Range petroleum system.

**Calibrating fault distributions**

*Tetsuya Tamagawa, Kazuhiko Tezuka, and Noriyoshi Tsuchiya*



Seismic and microseismic data along with in-situ stresses delineate subtle active faults under a strike-slip faulting stress regime in the Yufutsu field, Hokkaido, northern Japan. Active faults are presumed to be fluid pathways created by shear dilation.

**Tight-gas sandstones**

*Andr s Fall, Peter Eichhubl, Stephen P. Cumella, Robert J. Bodnar, Stephen E. Laubach, and Stephen P. Becker*



The low permeability sandstone of the Piceance Basin, Colorado, exhibits gas charge under high pore-fluid pressure. Protracted growth of a pervasive fracture system is the consequence of gas maturation and reservoir charge and is intrinsic to basin-centered gas reservoirs.



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**Falklands**  
from page 38

newly formed and fledgling independent company set up, as his new vehicle Desire Petroleum was, to exploit just the Falklands opportunity.

With some persistence and forethought, Phipps also managed to take a small equity position with Lasmo in a couple of the more prized blocks at the time.

When the first six wells, drilled in 1998, proved a working oil and a separate gas petroleum system in the Cretaceous lacustrine rift basin to the north of the Islands, everyone thought that we were on the brink of exploration success.

The vagaries of the oil price, however – and its 1998 crash to less than \$10 per

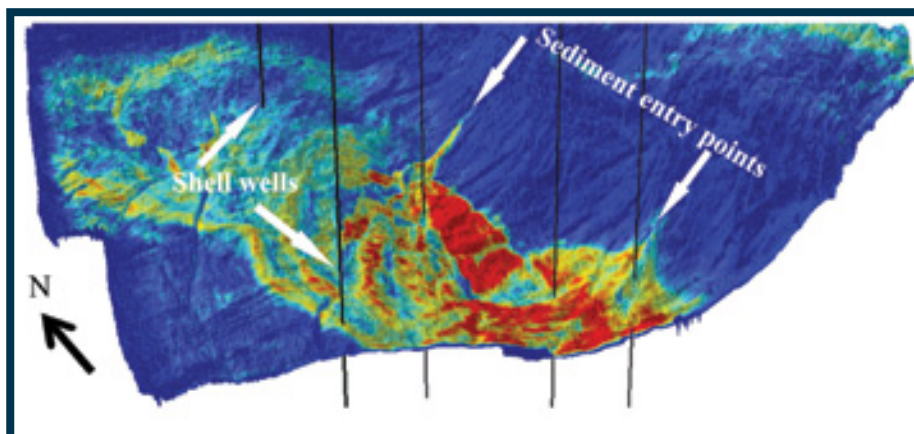


Figure 3 – Amplitude and seismic drape of Sea Lion field.

barrel – led to the majors pulling out of the basin, leaving their small-equity partners, the likes of Desire Petroleum and Argos Resources, a local company started by a

couple of fishing industry entrepreneurs, holding some of the prime acreage in the northern rift basin, with its proven world class lacustrine source rock.

**New Targets for a New Century**

Phipps and Desire Petroleum worked tirelessly with the British Geological Survey (BGS) and the regulators in the Falkland Islands Mineral Resources Department for the next decade to kick-start exploration again after the price crash.

In a paper written with a colleague from Shell in 2000, I identified how the basin's best remaining potential lay adjacent to the eastern rift margin, and with Desire we set about trying to identify sand entry points, acquire new 3-D data and find an affordable deep water semi-sub to drill at an affordable price.

Desire's 3-D data identified numerous basin margin targets, and in 2010 Desire eventually found a rig to drill in the region again. However, not before another entrepreneur – this time a complete industry outsider, and a lawyer to boot, but with other Falklands business interests – had convinced the regulator to licence to him the ex-Shell acreage, where Shell in 1988 had encountered live oil coating their logging tools as they pulled out of their second hole and, as it transpired, out of the basin itself (figure 2).

That entrepreneurial lawyer, Richard Visick, with an eye for a Shell walk-away and sensing a great opportunity, set up Rockhopper exploration, shot his own 3-D across the eastern basin margin and, following the promotional literature from the regulator's department that suggested looking for basin margin sands, signed up to Desire's drilling campaign and set about drilling the potential basin margin fans immediately to the east of Shell's oil shows (figure 3).

The rest, as they say, is history, with the resulting Sea Lion discovery (STOIP, about 1.2 billion barrels) currently being readied for development by Premier Oil.

**Bold Steps Forward**

Despite the industry's reluctance to take a punt in the deeper water blocks east and south of the Islands in 1995, the government embarked on a successful open-door invitation in the early 2000s, and attracted two more gambling entrepreneurs into the area, stepping boldly where the majors feared to tread.

Borders and Southern Petroleum was set up by the Scottish mining millionaire Harry Dobson, who had trained as a farmer in his younger days, and developed a Falkland's interest during a cruise ship visit there; the company went on to make the first deepwater discovery south of the Islands when it spudded the Darwin gas condensate field discovery well earlier this year.

Similarly, Falkland Oil and Gas Ltd, which was the brainchild of the late legendary Australian entrepreneur and share promoter Alan Burns – who had founded Hardman Resources previously in Perth and subsequently the Bahamas Petroleum Company – went on to claim the Loligo gas discovery this past September, on acreage that had recently been farmed into by the Italian giant Edison.

Entrepreneurs make a real difference, particularly those with an emotional attachment to a concept or a place.

And as in many places worldwide – where the majors went but gave up early – there have been rich pickings around the Falkland Islands for those small, aggressive companies willing to take a punt, believe in the geology, work closely with the regulator and invest in frontier exploration. ■



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# Wigley's Vision: Making Data More Accessible

By BARRY FRIEDMAN, EXPLORER Correspondent

In the valued storage areas of AAPG offices in Tulsa, in electronic files and databases, cabinets and binders and loose leaf folders and online archives there are approximately a half million maps, photos, AAPG BULLETINS, AAPG publications, well logs and other important geoscience information.

To cull through it all – separating, if you will, the wheat from the chaff – is time consuming, inefficient, frustrating and often fruitless.

And it's heavy.

Helping AAPG move deeper into the 21st century is Datapages Inc., a wholly owned subsidiary of AAPG that is the digital publisher for both AAPG and the geoscience community. It digitally captures geological publications – including the services of the Archives, *Search and Discovery* and GIS-UDRIL – and archives them to electronic media, thereby ensuring their future viability.

And helping Datapages get that job done is AAPG member Peter Wigley.

Wigley, a London-based consultant, is a long-time director on the Datapages board – and an expert in data acquisition, storage and utilization. It was only natural that he be named director of the soon-to-be-launched Datapages Exploration Objects (DEO) initiative.

DEO, an exciting and potentially significant advancement for data-seeking geoscientists everywhere, promises to be what Wigley calls a



WIGLEY

**“What would be really good, instead of just accessing this archive from a text search, is if people could access the archive from a map.”**

digital “deep indexing program” that will euphemistically cram reams of paper and materials into a desktop Geospatial Information System (GIS) application so users could have ready access to the material – all the material, or just the material that was needed.

He was a natural for the director role because:

- ▶ He has enormous, world renowned expertise in the area.
- ▶ DEO, basically, was his idea.

### Going Deeper

Wigley's vision for DEO was and is to use cutting-edge technology to make data and other information easily accessible to all geoscientists.

And it's not that there wasn't information already to be found online; the problem was it was cumbersome, difficult to locate and, once discovered, often incomplete.

“At the moment, if you want to access

the information online,” he said, “you go into a little search screen, click the boxes you want to search, and if you're lucky, something comes up and you find something.

“If you're not, you get nothing,” he quickly added. “I mean, it's ok, but it's a little clunky.”

Well, he wants the possibility of that “nothing” to go away. And he hates clunky.

“What would be really good,” he said, “instead of just accessing this archive from a text search, is if people could access the archive from a map.”

With the map as the interface – the actual browser – he hopes that users will be able to go “deep, deep down” into the archive itself.

“We don't want to stop at the title, because embedded into the article are lots of figures, namely maps, seismic sections, cross sections, core photographs ... a whole suite of things called expiration objects.

“We want to get right down into that.”

### Instant Delivery

To do that, obviously, he had to first make a deep index from which users could mine. That body now consists of 550,000 entries – with 10,000 more entries coming on each year – and within those entries are layers and layers of additional information.

He uses the word “metadata,” a word he says he hates, but nonetheless describes DEO.

“It's data about the data.”

At the moment, this system's details are still evolving, but he says DEO will be available as a subscription and will be “really dynamic.” With all the good work out there, he says, especially in the area of (*Search and Discovery*), “we need to be on top of that.”

Wigley emphasizes again – in fact, he did so on a number of occasions during the interview – that it is the deep index that will be the most prized possession and most difficult hurdle of DEO.

“It's the creation that took forever,” Wigley says of the index, which began in the 1990s.

One of its special features is called “geo referencing,” which entails tagging a map so it can be pulled into a GIS application and used with other map layers.

“But you need to add the coordinates so it lines up in all the right places,” says AAPG member Ron Hart, AAPG Datapages manager.

**Continued on next page**

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## AAPG GEOSCIENCES TECHNOLOGY WORKSHOPS

# Focused Workshops to Enhance Your Career

INFORM DISCUSS LEARN SHARE: THE AAPG GTW EXPERIENCE

### Asia Pacific Deepwater Plays: Exploration and Production

12-15 March 2013 • Brunei Darussalam  
(2 ½ days GTW, 1 ½ days Field Trip)

Keynote presentations from Henry Posamentier (Chevron), Brad Prather (Shell), Emilio Mutti (University of Parma)

Deepwater plays in Asia-Pacific remain a hot topic as many operators are active with their exploration activities whilst some fields are in the appraisal and development stage. New technologies and geological concepts were brought into the region and applied in a variety of studies and projects.

This workshop facilitates companies and individuals who are involved in Asia-Pacific deepwater plays to share and learn from others. Presenters will bring updates on various deepwater plays in the region and analogs from different regions will be presented in this event as well. There will be several open discussion sessions to involve participants in interactive discussions.

Expected to attend are exploration and development geologists, geophysicists, log analysts, and managers involved in deepwater exploration and production activities. The workshop will benefit everyone from experts to those unfamiliar with deepwater systems.

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### Profits & Pitfalls of Shallow Seismic Anomalies

4-5 June 2013 • Kuala Lumpur, Malaysia

This will be AAPG's first-ever GTW in Malaysia. There have been several recent well-tests of shallow seismic anomalies in Malaysia and in SE Asia – with decidedly mixed results. Speakers will be invited to work through pre and post drill analysis and then focus on lessons learned to design a way forward so that the industry can increase the success-rate from these class of exploration targets.

Many DHI or DrHI (Direct reservoir-IC Indicator) studies, especially in NW Borneo, have been carried out over the years, but if we cannot predict accurately in the shallow sedimentary section - where we have the best signal-to-noise ratio – it decreases confidence at more deeply buried targets. What do new techniques have to offer? (CSEM, multi-azimuth 3D, advances in the use of shear and converted shear waves, better processing algorithms). This is the chance to discuss what has happened and to learn about new tools/techniques that could improve your firm's exploration success. Can this learning be extended to the drilling of wildcats in less-calibrated regions?

This workshop is expected to be of key interest to all explorationists in the SE Asian region. Join this GTW to share your insights and experiences and update your skills with the experiences and insights of others.

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For information on these AAPG GTWs, please log on to our website at <http://www.aapg.org/gtw>



**PROFESSIONAL** news BRIEFS

**Clarence P. Cazalot Jr.** has been elected chairman of the American Petroleum Institute's Board of Directors. His one-year term begins Jan. 1. Cazalot is president and CEO of Marathon Oil in Houston.

**John Cryan**, to principal geophysicist, Tullow Oil, London, England. Previously geophysicist, Anadarko Algeria, Hassi Messaoud, Algeria.

**Robin Dean**, to geological manager, PRE Resources, Denver. Previously geological manager, Gasco Energy, Denver.

**Rusty Gilbert**, to technical services manager, Chevron, Moon Township, Pa. Previously earth science mentor, CABGOC, Malongo, Angola.

**Stephen Hermeston**, to chief technical officer, White Rose Energy Ventures, London, England. Previously chief executive officer, CGX Energy, Houston.

**Richard Loftin**, to senior staff geologist, Apache Corp., Houston. Previously geologist, Ballard Exploration, Houston.

**James McIlroy**, to senior explorationist-east Carpathians group, OMV Petrom S.A., Bucharest, Romania. Previously senior seismic interpreter, Petroleum Development Oman, Muscat, Oman.

**Allen Middleman**, to geology manager-east region, Denbury Resources, Plano, Texas. Previously geoscience manager-

Barnett district, Chesapeake Energy, Oklahoma City.

**Sharon Mosher** is the 2013 president of the American Geosciences Institute. Mosher is dean and the William Stamps Farish Chair at the Jackson School of Geosciences at the University of Texas at Austin.

**Scott Pinsonnault**, to director, Deloitte CRG, Dallas. Previously vice president, SFC Energy Partners, Denver.

**Berry H. "Nick" Tew Jr.** is president-elect of the American Geosciences Institute. Tew is the state geologist of Alabama and director of the Geological Survey of Alabama, Tuscaloosa, Ala.

**Daniel B. Williams**, to senior development geologist, Suncor Energy Norge, Stavanger, Norway. Previously senior geologist, 3-D reservoir characterization, Envision, Stavanger, Norway.

**Mark Yarlot**, to manager of geology, Hathaway, Bakersfield, Calif. Previously geological adviser, Vintage Production California, Bakersfield, Calif.

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

Continued from previous page

"It used to be, you buy a text book, you had just the book," Hart said, "but now you have all the supporting information online."

According to Hart, with the old system, it could take users four-eight hours to even locate the map he or she wanted.

"And now it can be done with a click of the mouse," he said.

It will be an Internet-based delivery system to customers, which will be quite a difference from, literally, the voluminous binders that companies used to receive from AAPG.

Time is a big byproduct. Now, in keystrokes, people can access information that took hours – like extracting maps.

"We literally used to ship it out to them in binders."

Hart added that users no longer want to wade through, literally, mounds and mounds of materials, maps and reports, which is why GIS applications are so in demand.

**Give It Back**

As you can imagine, to compile all this information in one place is not cheap.

"It's costing a huge amount of money bringing this stuff together and keeping it operational," Hart said, explaining the reason the system will be a subscription service.

"The idea is that they will get full global searching," promising that those who use the system will be, in a sense, at an "all-you-can-eat buffet."

For the system to have any worth, though, it needs to be updated regularly. Both Wigley and Hart say this will be done on a monthly basis once DEO is up and running – something they both say will occur in March.

Specifically, Wigley says a company in India is working on converting file formats from images to georectified map layers.

For Wigley, who created a similar index for the Exploration Fabric of Africa Project and who's now a bit closer to retirement, says he can see the light at the end of this digital tunnel.

"The bones of the index have been established, so from there I have been able to create a 10-year test.

"It's payback time for me," Wigley said on why he's willing to spend the next part of his career in a sunny room at his Devonshire house, watching sheep in the field and building the database.

"When you get to a certain age, and if you don't like gardening – and I don't – I want to do something," he said. "I have been a member of AAPG since 1974, and it's time to give something back." ■



**Industry professionals and students are invited to submit abstracts that relate to any of the topics below.**  
Sessions and formats (oral or poster) will be determined by actual submittals.

**THEME 1: Latin American Basins and Petroleum Systems**

Theme Chairs: Carlos Macellari (Repsol) and Tomas Villamil (C&C Energy)

Sub-Categories

- Fold and Thrust Belts
- Foreland Basins
- Rift Basins and Passive Margins
- Geochemistry

**THEME 2: Unconventional Resources**

Theme Chairs: Jaap Veldkamp (Shell) and Peter Rumelhart (ExxonMobil)

Sub-Categories

- Global Perspectives of Unconventional Resources
- Rock and Fluid Characterization of Unconventional Resources
- Controls on Producibility of Unconventional Resources
- Case Studies in Unconventional Resources: Frontier Plays
- Case Studies in Unconventional Resources: Early Development
- Application of New Technologies in Unconventional Resources

**THEME 3: Challenges in Heavy Oil**

Theme Chairs: Jairo Lugo (Pacific Rubiales) and Enrique Velasquez (Ecopetrol)

Sub-Categories

- Case Studies (traps types, fluid regimes, etc.)
- Technologies (EOR, thermal recovery, etc.)
- Reservoir Characterization

**THEME 4: Mature Fields**

Theme Chairs: Malcom Allan (Aera Energy LLC) and Hector San Martin (PEMEX)

Sub-Categories

- Enhanced Oil Recovery
- New Ideas in Oil Plays
- Case Histories
- Integrated Studies

**THEME 5: Deep Water Exploration and Production**

Theme Chairs: Silvia Couto dos Anjos (Petrobras), Paul Weimer (University of Colorado) and Claudia Ruiz-Graham (BP)

Sub-Categories

- Subsalt and Presalt Imaging, Traps and Play Types
- Reservoir Characterization and Modeling of Deepwater Reservoirs
- Petroleum Systems Modeling and Oil Chemistry of Deep Water Settings
- Emerging Global Deep Water Provinces
- Tectonics, Sedimentation and Stratigraphic Traps in Deep Water Systems

**THEME 6: Environmental Geology**

Theme Chairs: Sergio Sarmiento (Beicip) and Michael Young (BEG, University of Texas at Austin)

Sub-Categories

- Hydraulic Fracking
- Footprint Reduction and Public Concerns
- Carbon Sequestration
- Oil Spills and Air Emissions

**SPECIAL SESSION: History of Petroleum Geology** (oral only)

Chairs: Hans Kraus (Independent Consultant) and Daniel Truempy (Gran Tierra Argentina)

**CALL FOR ABSTRACTS OPEN**  
Submit your abstract online by 18 January 2013

[www.AAPG.org/ICE](http://www.AAPG.org/ICE)



**REGIONS and SECTIONS**

*Inaugural event in Istanbul*

**APPEX Regional Starts Strong**

By CIARAN LARKIN

Nearly 200 attendees from 29 countries attended the inaugural APPEX Regional 2012 event, held Nov. 8-9 in Istanbul, Turkey, and organized in association with Turkey's National Oil Company, TPAO.

The participants came together to make deals and discuss challenges relating to the regional exploration of eastern Europe, the eastern Mediterranean region, the former Soviet Union and northern Iraq.

The event was built on the success of the annual APPEX Global conference in



London, an established forum for those looking to build partnerships and promote prospects for exploration and production all over the world.

The inaugural APPEX Regional venue was Istanbul's Ceylan Intercontinental Hotel. Tankers passing through the Bosphorus strait were clearly visible from the upper floors, emphasizing the region's position as a hub of activity for the oil and gas industry.

"TPAO was delighted to be the key sponsor of the first ever Regional APPEX event held in Istanbul, (which) brought together the right people from the region and beyond," said Mehmet Uysal, TPAO chairman and president. "The excellent topical speaker sessions were invaluable and the networking opportunities were highly useful – and combined with the established APPEX format, ensured the deal making was a more straightforward process."

The program itself was split geographically, starting with a broad focus on central and eastern Europe and then diverging into specific sessions on the Black Sea, Caspian Sea, northern Iraq, the former Soviet Union and east Mediterranean.

Highlights included:

▶ Tony Hayward, CEO of Genel Energy, gave an account of his company's exploration activities in Kurdistan and put forward a timeline for oil supply to Turkey.

▶ Alex Jackson, political risk analyst for Menas Associates, spoke about maritime border issues in the Caspian Sea, providing an expert legal perspective on the prospects for diplomatic confrontation between countries that are building naval capacity in the region.

▶ Lilit Cota, director of exploration projects in southeast Europe for INA, gave a presentation on offshore oil and gas exploration in Croatia with an emphasis on the Adriatic Sea, in particular, as well as additional information on the challenges of operating in a new legal environment.

A unique aspect of APPEX is the popular prospect forum, which gives independent oil companies an opportunity to pitch current exploration opportunities to the audience. APPEX Regional 2012 featured a wide range of prospects from places such as Italy, Tunisia, the Sicily channel, Albania, the Arabian Sea and, of course, Turkey.

A gala celebration dinner organized by TPAO was held the final day, and the attendees' feedback was encouraging, including these comments:

✓ "Participating in APPEX was really a pleasure for me. I had opportunities to listen to relevant presentations and meet a lot of experts."

✓ "Thanks for the excellent organization and for hosting us in Istanbul."

✓ "It was thoroughly enjoyable and useful, and all the delegates I spoke to about it said the same. Looking forward to next year's event already!"

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**Registration Open**

A rich human history of civilisation, trade and war is deeply rooted in the complex ancient geology that underlies the Mediterranean region, having evolved through the convergence of the European and African plates and the closure of the Tethys Ocean. In more recent times, oil and gas exploration has found success in the diversity of resulting extensional and compressional tectonic regimes, with a procession of new plays being identified over decades of industry and academic activity. Despite intensive exploration, the region continues to deliver tangible success through its rich diversity of play types, as recent discoveries in the Eastern Mediterranean have testified.

This significant conference will assemble some of the best current thinking in Mediterranean petroleum geology, from the tectonics that underpin the basin, to the Messinian salinity event and its impact on exploration. From North Africa to the Adriatic, this conference will bring together the multiple cultures that surround this diverse region to reflect on a common geological framework and the petroleum systems that transcend political boundaries. With its position to the west of 2.5 million sq. km of water, Barcelona will form the ideal backdrop to this timely event.

**Themes will include:**

- Geotectonic evolution of the Mediterranean.
- The impact of the Messinian Salinity event in exploration.
- Carbonate plays in the Mediterranean.
- Petroleum systems and source rocks.
- New exploration in the Eastern Mediterranean.
- The Nile Delta revisited.
- Recent exploration along the North African coast.
- The Western Mediterranean and the Alboran Sea in focus.
- Prospectivity and new plays in the Adriatic Basin.

**Register before the 24th December and save up to € 100.00**

Interested in **sponsoring** this event? Visit the website for full details of our sponsorship packages or contact Fionn Devine at [fdevine@AAPG.org](mailto:fdevine@AAPG.org). We can customize sponsorship opportunities to match your marketing plan.



## Deadlines Near Student Grants

The application deadlines for AAPG Foundation grants available to undergraduate and graduate students are fast approaching.

In all cases, the application form and other information can be found online at [foundation.aapg.org/index.cfm](http://foundation.aapg.org/index.cfm).

► For the **L. Austin Weeks Undergraduate Grants**, the application deadline is Dec. 16.

New this year – an AAPG Foundation committee will select a maximum of 67 students and AAPG Student Chapters to receive a Weeks grant. Each selected chapter and student will receive \$500.

Chapters can nominate one student to apply online; please contact your faculty adviser to be nominated.

► The **Grants-in-Aid graduate grants** deadline is Jan. 13.

GIA grants provide financial assistance to graduate students (currently enrolled in master's or doctorate programs) whose thesis research has application to the search for and development of petroleum and energy mineral resources, and/or to related environmental geology issues.

There are 84 grants available, ranging in value from \$500 to \$3,000.

New graduate grants this year include:  
 ✓ John and Erika Lockridge Named Grant – \$3,000 for the Colorado School of Mines.

✓ M. Ray Thomasson Named Grant – \$1,000 each for the University of Wisconsin and University of Missouri.

✓ Martin D. Hewitt Named Grant – \$1,000 for McMasters University, Canada.

✓ Grants-in-Aid Committee Named Grant – \$500 for the "Chairman's Choice."

### FOUNDATION UPDATE

## Gunn Gives Million Dollar Gift

By NATALIE ADAMS, AAPG Foundation Manager

The AAPG Foundation has received a \$1 million gift from AAPG Honorary member and past AAPG president Bob Gunn, of Gunn Oil Co. in Wichita Falls, Texas.

Gunn also is one of the founding Trustee Associates, having joined in 1976, and he has supported many of the Foundation's programs over his entire career.

His most recent gift was designated for the Foundation's General Fund.

Gunn, a nationally noted petroleum geologist, was AAPG president in 1978. He also is one of AAPG's most honored members; awards include the Sidney Powers Memorial Award, AAPG's highest honor, plus the Public Service Award and the DPA Heritage Award.

\* \* \*

The AAPG Foundation Trustee Associates recently held its 35th annual



GUNN

meeting in Scottsdale, Ariz. The event, chaired by Don O'Nesky, included business meetings, recreational events, field trips and various tours.

Herb Davis received the 2012 Chairman's Award for his outstanding service to the Foundation. The award is given to recognize persons who have made extraordinary contributions, both monetary and service, to the Foundation.

Trustee Associates officers for the coming year also were announced. They will be:

- Dick Bishop, chair.
- Rick Fritz, vice chair.
- David Worthington will serve his second term as secretary/treasurer.

The next Trustee Associates annual meeting will be held Sept. 22-25 at the Suncadia Resort in Cle Elum, Wash.

Information on joining the Trustee Associates is available online, at [foundation.aapg.org](http://foundation.aapg.org).

#### Foundation (General)

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 Jessie Valdez Becerra  
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 Harry Douglas Cowan  
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**Grants-in-Aid Fund**  
**Bernold M. "Bruno" Hanson**  
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**Named Grant**  
 James E. Briggs

**Harry and Joy Jamison Named Grant**  
 Harrison C. Jamison  
*In memory of R. Frederick Flege*

**Herbert G. Davis and Shirley A. Davis**  
**Named Grant**  
 Herbert G. Davis  
*In memory of Robert Gutru*

**Jay M. McMurray**  
**Memorial Grant-in-Aid**  
 Linda Lebsack  
*In member of Jay M. McMurray*

**Michael S. Johnson Named Grant**  
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*In honor of Charles E. Jacobs*

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## WHY I DONATE TO THE AAPG FOUNDATION:



Membership in AAPG has given me a place outside of places I have worked. The Foundation is a place for me to financially support the Association.

-Susan Landon

AAPG represents geologists very well. We should support the organization with effort and money. I encourage you to do the same.

-Byron F. Dyer



-Sam Peppiatt

Each of us has benefited in many ways from the resources of AAPG. I believe it is important that each of us "give back" to our profession for the benefit of those who follow.



-John Sweet

K-12 is a good place for me to memorialize former company and industry friends who have left our life on earth. My age class is diminishing rapidly and some of them have lost children, too. A side benefit is that, without AAPG, those of us who are left may otherwise not have known those departed.

Throughout my career, AAPG has supported the geological sciences as well as those who work in the fields. I consider it not only a duty but also a privilege to support AAPG in that work.

-Bill D. Holland



To give to the AAPG Foundation, go online to <http://foundation.aapg.org/donate.cfm> or mail to P.O. Box 979, Tulsa, OK 74101. Questions? Call 1-888-945-2274 Ext. 2644.



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## READERS' FORUM

### Outstanding Field Trip

About 10 people, including myself, attended the Singapore "Geothermal Excursion," which was a one-day pre-conference field trip associated with September's AAPG 2012 ICE in Singapore. The field trip leader was Dr. Grahame Oliver, National University of Singapore.

The main purpose was to visit a hot spring where the water comes to the surface at a hot 70 degrees C. But there was much more to the field trip than studying and discussing Singapore's geothermal potential. We also visited three spectacular outcrops of Permo-Triassic fractured granites, and also examined Upper Triassic Jurong Formation sediments that outcrop along the north shore of Sentosa Island.

Singapore is a small and crowded city state – it squeezes about 5.5 million people into an area covering only 700 square kilometers – so it is not the sort of place where one expects to see some good geology. However, Professor Oliver knew all of the interesting geological spots – and everyone in the group was unanimous in their appreciations to him for leading an outstanding field trip.

Tako Koning  
Luanda, Angola

### Golden Moon Memories

It was December 1972, I was in graduate school working on my master's in geology and Apollo 17 had just landed on the Moon. One of the two lunar astronauts was Harrison "Jack" Schmitt, a geologist.

Wow!

I was raised in the San Fernando Valley by parents who worked at Rocketdyne on the great rocket engines that propelled Dr. Schmitt to the moon. I could hardly have been more motivated to be a geologist. Think about it: The only scientist to go to the moon was a geologist. Maybe I would be lucky enough to travel to the moon some day.

For the time, the next best thing happened.

A company in Studio City had developed a high definition television camera that was used by Schmitt and Gene Cernan on the moon, and during lunar excursions they would shoot high definition video. The signals were broadcast back to NASA, and NASA would send them to the company in Studio City for processing. The processed images would be viewed on their high definition television prior to being sent back to NASA.

My father and I were invited to join a small group and spend the day viewing these images in real time prior to them being sent to NASA. Our small group was the first to see the lunar astronauts move about on the moon in high definition color TV.

My Dad was as excited as I was – the only people with a better view were Schmitt and Cernan. It was a wonderful day of excitement and bonding with my father. It was also one of the strongest motivators for me to continue studying geology.

Sadly, my dad and I never made it to space, but I did get to meet and know Jack Schmitt. He is every bit the hero and role model I hoped he would be.

I am still a geologist and love it. I wish our country still had the spirit for space travel that President Kennedy boosted to prominence. It has been 40 years since Harrison Schmitt walked on the moon.

Jack, thank you for braving the

cosmos 40 years ago and for continuing to inspire today's young scientists.

Don Clarke  
Lakewood, Calif.

### It's Time

It's time for Congress, the administration and related government agencies (EPA in particular) to recognize, and accept, fossil fuels as the principal suppliers of energy for our nation's needs for decades to come.

It is time to reduce and, where possible, eliminate the huge subsidies supporting alternatives (solar, wind, biofuels), none of which can compete with fossil fuels for efficiency or cost. Alternatives will not be needed for some time as we now have an abundance of fossil fuels resulting from new technology in drilling and producing oil and natural gas.

It is time to develop a North America energy policy for the United States, Canada and Mexico. The three working together will result in energy self-sufficiency, thus freeing the United States from importation of oil from those who are not our friends. All that is required for a North America energy policy is to free up our own areas (offshore, Alaska ANWR, etc.) for drilling and open our borders and build a few pipelines (Keystone XL, for example) to bring oil and gas from Canada, Alaska and Mexico to the U.S. market.

In order for a North America energy policy to emerge, Mexico will require our help in developing their considerable oil and gas reserves, particularly those located along the U.S. Mexico border and their portion of the Gulf of Mexico.

Now the question: How can the United States best help Mexico? Since the United States is the principal market for illegal drugs, this market could be substantially reduced by U.S. legalization of drugs. Start with legalizing marijuana and continue with legalizing other drugs when U.S. distribution centers are in place to provide controlled substance for those in need.

Will the United States take such action?

It is time.

Dick Baille  
Houston

### Two Suggestions

The United States could be energy independent within five years if it would do these two things:

▶ First, convert our vehicles to natural gas. This would save 50 percent of our (use of) foreign oil.

The Love stores in Oklahoma have natural gas filling stations. The cost of natural gas equivalent is about one-third the cost of gasoline.

The multi-million dollars the feds loan for one ethanol plant would build dozens of natural gas filling stations.

▶ Second, lifting the ban on 80 percent of our offshore drilling would let our oil companies supply the other half within five years.

Marvin E. Frankamp  
Wichita, Kan.

Continued on next page

## IBA Correction

The winning school of the 2012 Imperial Barrel Award competition was misidentified in the November EXPLORER.

The winning school was the University of Louisiana at Lafayette.



**PROTRACKS**

# Section Meet-N-Greets Networking: A YP Bonus

By JONATHAN ALLEN and NIKKI MORRIS, AAPG YP Committee

**A**APG'S Young Professionals aspire to build an understanding of the many benefits that come with membership in AAPG with the younger generation of geoscientists. We strive to make the value of a lasting relationship with the Association evident to everyone.



ALLEN

To that end, the YPs have worked tirelessly forming local chapters around the world. These local chapters are actively providing valuable events and services to the YP population.



MORRIS

One of the many benefits of membership in the world's largest geological society is access to the AAPG membership network – and one of our most successful initiatives is our YP networking events.

This month we're highlighting two recent local chapters' networking events demonstrating the value that comes with AAPG membership.

▶ The Southwest Section YPs held a "Meet-N-Greet" in September during the West Texas Geological Symposium in Midland, Texas.

Concho Resources sponsored the event, which featured a group of 30 geophysicists, geologists, graduate students, landmen and Southwest Section/WTGS leaders networking in a small, informal group setting.

Specifically, participants were able to talk with each other about current work projects and learn about others' expertise.

The event provided an excellent opportunity for students and YPs to interact with the Society and Section leadership. The Southwest Section YPs are planning to expand their activities into the Dallas/Fort Worth area and are currently working with the Dallas Geological Society to host a similar event in the fall.

▶ In Bakersfield, Calif., the local YP chapter partnered with two other young professional organizations in the area – the Society of Petroleum Engineers Young Professionals and the Young Professionals in Energy – for an end-of-summer networking event that brought together over 70 young professionals working in all areas of the energy industry.

Petrotechs, landmen, lawyers and accountants all had the opportunity to network with one another in a relaxing atmosphere – as well as win some great raffle prizes provided by Halliburton.

The event also provided a group of summer interns with the chance to network with young professionals from a variety of different companies and disciplines, thereby broadening their understanding of the industry.

Officials called the event a great success – and the partnership between the Bakersfield YP groups is expected to grow over time.

Along with networking events at the local level, YPs regularly hold similar events at the Section/Region meetings as well as the AAPG annual conventions (ACE) and international conferences (ICE). All of these events have helped expand our young professionals' understanding of AAPG and the industry in which we work.

Additionally, the contacts and friendships made at these events serve as a fundamental reminder of one of the many benefits of this Association: High-quality industry connections are just a handshake away from being part of your network.

*(Editor's note: Jonathan Allen represents the AAPG Pacific Section and Nikki Morris represents the Southwest Section on the YP Committee.)*

... our society has become intolerable, unforgiving and "zero-risk" taking.

▶ Regarding high leasing costs: Yes, it's a huge up-front high-risk capital outlay without any assurance of success. That's the reason why large companies wait until success is reported widely; majors, would rather buy the success and not take the frontal risks.

One solution may be to go at the URPs with a consortium model, which I think won't violate any "anti-competition" laws on books. There are many advantages in such approach.

Please keep on writing such interesting columns for us.

Also, thank you for bringing all players, e.g. AAPG, SPE, SEG, in this giant game of finding "new resources." More inclusion in such serious dialogue is good for the harmonic growth of our industry, and for better success for the upstream community at large.

Kumar Bhattacharjee  
Houston

**Continued from previous page**

**Thank You, Ted**

Regarding the September President's Column by Ted Beaumont ("Changing Times, Changing Needs"): Thank you, Ted, for highlighting some very common-sense issues involved with finding and developing unconventional resource plays (URPs).

Here are my brief comments:

▶ The article's title should also include "Changing Investment Climate," due to the ever-growing interference by the U.S. Environmental Protection Agency, and the exploding political situations in many oil-producing nations that are making any investment very risky.

▶ How much data? The closest and most common analog is the millions of cases of physicians' requirements for "various tests"/data-acquisition each year. Why do they exist? To avoid all risk-taking

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Pacific Coast Section Society of Exploration Geophysicists



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**ABSTRACTS** of not more than 250 words should be submitted for review online or by email to the Technical Program Chair, George Rhoads ([grhoads@chevron.com](mailto:grhoads@chevron.com))

Submissions due Dec. 15 for the *Journal* and Jan. 15 for the *Transactions*  
Notification of acceptance by Jan. 31, 2013.

Oral and poster presenters must submit either a paper (10-12 pages) or an extended abstract with key figures for review by at least two reviewers by March 23, 2013. Instructions for authors at [www.GCAGS2013.com](http://www.GCAGS2013.com)



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# Last Call for URTeC Papers

The call for papers deadline has been extended for the inaugural Unconventional Resources

Technology Conference (URTeC), a joint venture that will bring together for the first time the key disciplines and technologies engaged in the development of North American unconventional resource plays.

Papers will be accepted through Dec. 12.

URTeC, sponsored by AAPG, the Society of Petroleum Engineers and the Society of Exploration Geophysicists, will be held Aug. 12-14 in Denver.

Organizers are seeking papers from petroleum engineers, geologists, geophysicists and other professionals interested in sharing innovations, best practices and experiences in integrated approaches for North American unconventional resource plays.

The event, organizers say, fills the unique need for a peer-reviewed, science-based unconventional resources conference that will take an asset team approach to development of unconventional resource plays.

The program includes 20 themes applicable to unconventional resources and appeals to engineers, geologists and geophysicists, including:

- ▶ Unconventional Project Development.
- ▶ Unconventional Reservoir Characterization.
- ▶ Unconventional Shale Plays.
- ▶ Unconventional Tight Oil and Tight Gas.
- ▶ Unconventional Coal Seam/Bed Methane.



- ▶ Other Unconventional Reservoirs.
- ▶ Formation Evaluation of Unconventional Reservoirs.
- ▶ Fracture Characterization.
- ▶ Lateral Well Characterization.
- ▶ Flow Mechanics in Tight Reservoirs.
- ▶ Laboratory Methodologies.
- ▶ Reservoir Monitoring.
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- ▶ Drilling Optimization.
- ▶ Completion Optimization.
- ▶ Geomechanics.
- ▶ Three-D Seismic Applications.
- ▶ Health, Safety and Environmental Issues.

The three technical program co-chairs are AAPG Honorary Member and past president Steve Sonnenberg, with the Colorado School of Mines; AAPG member Ken Beeney, with Devon Energy; and Luis Baez, with BG Group.

"The combined power of these three leading scientific organizations means URTeC has the potential to be the most substantial inter-society collaboration since the Offshore Technology Conference began in the 1960s," they write.

To submit an abstract, or for more information and/or to request information on exhibiting and sponsoring, visit the URTeC website at [www.urtec.org](http://www.urtec.org).

And remember: The deadline is Dec. 12.

## CLASSIFIED ADS

### POSITION AVAILABLE

**Geology Tenure Track Position**  
Department of Earth Sciences  
The University of South Alabama

The University of South Alabama Earth Sciences Department invites applications for a tenure-track faculty position at the Assistant Professor or Associate Professor level beginning August 15, 2013. Candidates with research and industry experience in petroleum geology, geophysics, and related sub-disciplines are particularly encouraged to apply. Minimum qualifications are a Ph.D. degree in geology at the time of appointment. Interested potential applicants may review position requirements at the following web site: [www.usouthal.edu/geography/](http://www.usouthal.edu/geography/). The University of South Alabama is an Equal Opportunity/Equal Access Employer.

\*\*\*\*\*  
**MISSISSIPPI STATE UNIVERSITY**  
Location: Mississippi State, MS

The Department of Geosciences at Mississippi State University invites applications for a full-time, tenure-track Assistant Professor position in geospatial technologies with geology background. Anticipated start date is August 16, 2013. A Ph.D. degree in the geosciences or a closely related field in natural sciences with emphasis in geospatial technologies, and geology is required at the time of appointment. Evidence of peer-reviewed journal publications and potential to develop an externally-funded research program are required. The candidate will teach introductory through graduate-level courses in remote sensing, image processing, web GIS, and advanced spatial analysis. The candidate's area of expertise within geology is open, but we welcome candidates with a background in environmental geology, structural geology, sequence stratigraphy, paleontology, oceanography, geophysics, and/or software use in subsurface analysis.

The successful applicant will be expected to develop courses in their area of expertise to support the department's Ph.D. program in Earth and Atmospheric Sciences. The successful candidate will be expected to be active in mentoring of graduate students through teaching, course development (both traditional and distance learning technology), and scholarly research activities (including publishing peer-reviewed manuscripts and acquiring external funding). He or she must be willing to collaborate with existing faculty. The department has a collaborative relationship with HPC<sup>2</sup> in parallel processing and visualization environment; maintains a GIS laboratory, biogeochemistry laboratory,

and sample preparation facilities. The university supports a broad spectrum of state-of-the-art analytical facilities through the Institute for Imaging and Analytical Technologies (<http://www.i2at.msstate.edu>).

The Department of Geosciences currently has 15 tenure-track faculty members and 11 instructors. The department offers B.S. and M.S. degrees in geoscience and a Ph.D. degree in Earth and Atmospheric Science within five areas of emphasis: atmospheric sciences, geology, environmental geosciences, geography, and geospatial sciences. In addition to the on-campus programs, our distance learning programs enroll more than 700 undergraduate and graduate students. Further information about the Department of Geosciences can be found at <http://www.geosciences.msstate.edu>.

Candidates should submit a letter of application, curriculum vitae, and names and e-mail addresses of three people who may be contacted for letters of recommendation. Applicants must also complete a Personal Data Information Form (PARF # 6982) online at <http://www.jobs.msstate.edu>.

We will begin reviewing applications upon submission. Mississippi State University is an Affirmative Action/Equal Opportunity Employer. Phi Beta Kappa members are encouraged to apply.

For submission or further information please contact:  
Dr. Shrinidhi Ambinakudige  
Chair of the Search Committee  
Mississippi State University  
Department of Geosciences  
P.O. Box 5448  
Mississippi State, MS 39762

Phone: (662) 325-3915  
Email: [ssa60@msstate.edu](mailto:ssa60@msstate.edu)  
Website: <http://www.geosciences.msstate.edu>

\*\*\*\*\*  
**The School of Earth Sciences and Environmental Sustainability at Northern Arizona University** invites applications for a tenure-track appointment as an Assistant Professor in Geophysics for August 2013. The successful candidate will teach senior and graduate courses in Geophysics and other classes as needed, conduct a successful sponsored research program in Geophysics, and support the Earth and Planetary Systems emphasis area of the new Earth Sciences and Environmental Sustainability PhD program. Minimum qualification is an earned PhD in Geophysics, OR, an earned PhD in related area with dissertation-related research in Geophysics, conferred by start date.

**Continued on next page**



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**IN MEMORY**

AAPG Honorary member John W. Rold, a retired consultant in Littleton, Colo., died Sept. 10. He was 85.



Rold received his bachelor's and master's degrees in geology from the University of Colorado, Boulder, and worked for Chevron for 20 years before starting the Colorado Geological Survey in 1969. He retired from the Survey in 1992 and did private consulting work for 18 years.

He received AAPG honorary membership in 2006.

- Elwood Bailey Bredell Jr.**, 84  
Cornville, Ariz., Sept. 28, 2012
- Patrick J. Chesterman**, 60  
Calgary, Canada, Sept. 14, 2012
- Arthur Beverly Elliott Jr.**, 79  
Hilton Head Island, S.C.  
Oct. 22, 2012
- Evard Pitts Ellison**, 89  
Houston, August 10, 2012
- Jodie Gillespie**, 41  
Marks Point, Australia, Oct. 5, 2012

- Robert J. Gutru**, 96  
Wichita, Kan., Oct. 6, 2012
- Philip Thayer Hayes**, 89  
Grand Junction, Colo.  
July 30, 2012
- Richard Kenneth Hose**, 92  
Cupertino, Calif., July 28, 2012
- Robert George Knabe**, 94  
Houston, August 26, 2012
- Leslie William Lease**, 91  
Kirkland, Wash., April 9, 2012
- Willard Oswald Lowe**, 86  
Sun City West, Ariz., Aug. 24, 2012
- Arlen Dee Poole**, 72  
Fayetteville, Ark., Sept. 3, 2012
- \* **John W. Rold**, 85  
Littleton, Colo., Sept. 10, 2012
- C. Brent Shumard**, 67  
Tulsa, Sept. 14, 2012
- John Frank Sulik**, 81  
Corpus Christi, Texas, Sept. 3, 2012
- James Ross Underwood Jr.**, 85  
Plano, Texas, May 16, 2012
- Francis Clark Whisler**, 84  
Russell, Kan., Aug. 2, 2012

**Continued from previous page**

**Tenure-track Faculty Position in Applied Geophysics, Baylor University**

Baylor is actively recruiting new faculty with a strong commitment to the classroom and an equally strong commitment to discovering new knowledge. Baylor aspires to become a top tier research university while reaffirming and deepening its distinctive Christian mission as described in Pro Futuris (<http://www.baylor.edu/profuturis/>).

The Department of Geology at Baylor University invites applications for a tenure-track Assistant Professor in Applied Geophysics. Applicants must hold a Ph.D. in geophysics, physics, or geology with an emphasis in geophysics at the time of appointment (August 2013).

Preference will be given to a candidate with a strong background in quantitative sciences whose research interests complement those of existing geophysical strengths in our department. Current strengths include earthquake seismology, potential field methods, geodynamics, and petroleum geology.

To apply, email a statement of teaching and research interests, CV, transcripts, and the names and contact information for three references to: Chair, Geophysics Search Committee: Jay\_Pulliam@baylor.edu.

As an Affirmative Action/Equal Opportunity employer, Baylor encourages minorities, women, veterans and persons with disabilities to apply.

**HEAD OF SCHOOL POSITION  
OSU BOONE PICKENS SCHOOL OF GEOLOGY**

The Boone Pickens School of Geology at Oklahoma State University invites applications for the School Head position. This is a tenured position at the rank of Associate Professor or Full Professor to be filled by July 1, 2013. Salary is competitive and commensurate with the experience and qualifications of the successful candidate. Applicants should have a PhD in geosciences or a related field, have an outstanding research and teaching record and be highly regarded and recognized by the national and international geoscientific community. A record of an established collaboration with the energy industry is desirable. Prior administrative experience is preferred and potential for academic leadership and mentoring is expected. The Boone Pickens School of Geology Head position is designated 50% administration and 50% academic. The successful candidate will be allowed to have reduced teaching load, but will maintain a research program through externally-funded projects, peer-reviewed publications and mentoring of graduate students. The specific research field is open but the successful candidate is expected to strengthen the School's research foci in conventional and unconventional hydrocarbons, continental tectonics and neotectonics, and surficial processes and environmental studies. Currently the School has 14 tenured and tenure-track faculty, 3 research scientists/post-doctoral fellows, 15 PhD students, 50 MS students, and 140 undergraduate students. The School has recently expanded and will continue growing in terms of student enrollment, additional faculty, and external resources. The School houses modern research and teaching facilities, including well-equipped geochemistry, geophysics, remote sensing, sedimentology, and tectonics laboratories, as well as technology-enabled classrooms and the Devon Visualization Laboratory. The School also maintains a Field Camp in Canon City, Colorado. The School's mission and activities are strongly supported by an extended network of alumni and an active advisory board. The School maintains a strong faculty-student-alumni relationship and active student chapters for professional organizations. Applicants should submit statements detailing: (1) Leadership vision, (2) Research interests, and (3) Teaching philosophy, along with a Curriculum Vitae, and the names, addresses, e-mail addresses, and phone numbers of three references to: Boone Pickens School of Geology Head Search c/o Dr. Loren M. Smith,

Department of Zoology, 501 Life Science West, Oklahoma State University, Stillwater, Oklahoma 74078, Phone: (405)-744-5555, Fax: (405) 744-7824. Screening of candidates will begin January 1, 2013 and continue until the position is filled. The filling of this position is contingent upon available funding. More information on Oklahoma State University and the Boone Pickens School of Geology can be found on the web at <http://go.okstate.edu> and <http://geology.okstate.edu>, respectively. OSU is an AA/EEO/E-Verify employer committed to diversity. OSU-Stillwater campus is a tobacco-free campus.

**Tenure track assistant professor in geophysics/petroleum geology job ad**

The department of Geography, Geology, and the Environment at Slippery Rock University of Pennsylvania (SRU) invites applications for a tenure-track Assistant Professor position in Geophysics/Petroleum Geology to begin August 2013. We seek candidates with expertise in applied geophysics, exploration seismology, and/or petroleum geology. The successful candidate will teach introductory geology courses and develop and teach geophysics, petroleum geology, and other appropriate upper-level courses. The successful candidate should also have the potential to develop a successful undergraduate research program. A Ph.D. in Geosciences with an emphasis in geophysics or petroleum geology is required at the time of appointment.

Apply: Candidates should submit applications online at <https://careers.sru.edu/hr>. Attachments to the application include a letter of application, including statements of teaching and research interests, curriculum vitae, e-copies of all academic transcripts, and three letters of reference. For those unable to submit electronically, please send applications to: Dr. Xianfeng Chen, Chair, Search Committee, Department of Geography, Geology, and the Environment, Slippery Rock University of Pennsylvania, 329 Advanced Technology and Science Hall, Slippery Rock, PA 16057; e-mail: [xianfeng.chen@sru.edu](mailto:xianfeng.chen@sru.edu). Review of application will begin January 22, 2013 and applications will be accepted until the position is filled. Slippery Rock University of Pennsylvania is an Affirmative Action/Equal Opportunity Employer. SRU encourages minorities, women, veterans and persons with disabilities to apply.

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**EXPLORATION 2013**

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Allen C. Locklin, (903) 592-1308 [alocklin@suddenlink.net](mailto:alocklin@suddenlink.net)



**Sedimentary Basin Analysis and Modeling  
Position, Berg-Hughes Center and Department of  
Geology and Geophysics, Texas A&M University**

The Berg-Hughes Center (BHC) for Sedimentary and Petroleum Systems and the Department of Geology and Geophysics at Texas A&M University invite applications from individuals for a non-tenure-track, three-year renewable contract position as a senior research professor (full professor) in Sedimentary Basin Analysis and Modeling beginning September 1, 2013. This position will be a joint appointment with teaching, research and service responsibilities in the Berg-Hughes Center and Department of Geology and Geophysics.

The principal responsibility of this position is to spearhead the collaborative research and teaching programs in the newly established Chevron-TAMU/BHC Basin Modeling Center of Research Excellence in the Berg-Hughes Center and Department of Geology and Geophysics. This responsibility includes leading in the development of a robust externally funded research program in basin analysis and modeling that includes research collaboration with researchers in the petroleum industry; teaching integrative courses that introduce advanced concepts and technologies needed for unraveling the geohistory of sedimentary basins and the origin and location of unconventional and conventional petroleum resources inherent to sedimentary basins, and supervising graduate students and mentoring faculty in the use of sophisticated computational and applied research approaches and techniques to solve complex geologic problems.

We seek candidates who have had extensive experience in sedimentary basin analysis and modeling and in serving as a team leader on multi-disciplinary research projects, and who have demonstrated the ability to develop and maintain an externally funded research program. Applicants must have a record of success in working collaboratively with researchers in academia and the petroleum industry and be enthusiastic about teaching integrative courses and supervising graduate students in basin analysis, basin architecture, basin modeling, basin geodynamics, and related areas.

Applicants must have an earned Ph.D. at the time of appointment. Successful applicants will be expected to teach effectively at the graduate level in basin analysis and modeling and related fields and in team taught courses, including classes in the Petroleum Certificate curriculum and to supervise undergraduate, M.S. and Ph.D. research, including students who are interested in pursuing careers in the petroleum industry. Applicants are expected to build and maintain a collaborative research program with colleagues in the College of Geosciences, the Berg-Hughes Center, the Department of Geology and Geophysics, the Department of Petroleum Engineering, and other energy related groups at Texas A&M University and the Texas A&M University System and with geoscientists and petroleum engineers in the oil and gas industry and national and international research institutions.

Interested candidates should submit electronic versions of a letter of application, curriculum vita, teaching philosophy, statement of research vision, strategies to implement that vision, and accomplishments, and the names and email addresses of at least three references to the Chair of the Basin Analysis and Modeling Search Committee ([mancini@neo.tamu.edu](mailto:mancini@neo.tamu.edu)). Screening of applications for the position will begin February 1, 2013 and will continue until the position is filled. The Berg-Hughes Center ([berg-hughes.tamu.edu](http://berg-hughes.tamu.edu)) and the Department of Geology and Geophysics ([geoweb.tamu.edu](http://geoweb.tamu.edu)) are part of the College of Geosciences, which also includes the Departments of Atmospheric Sciences, Geography, and Oceanography; the Geochemical and Environmental Research Group (GERG); and the Integrated Ocean Drilling Program (IODP). Texas A&M University, a land-, sea-, and space-grant university, is located in a metropolitan area with a dynamic and international community of 172,000 people. Texas A&M University is an affirmative action/equal opportunity employer committed to excellence through the recruitment and retention of a diverse faculty and student body and compliance with the Americans with Disabilities Act. We encourage applications from minorities, women, veterans, and persons with disabilities. Texas A&M University also has a policy of being responsive to the needs of dual-career partners.



# Advancing The Science, With Purpose

By DAVID K. CURTISS, AAPG Executive Director

The Bosphorus is a thin strait separating the continents of Europe and Asia. For millennia it has been a crossroad, where east meets west, in the beautiful city of Istanbul. And it is here that we've just concluded the first-ever Regional APPEX conference.

Building on the highly successful Global APPEX held annually in London, nearly 200 delegates from 29 countries came to Istanbul, this regional hub of commerce – and location of AAPG's 2014 International Conference and Exhibition – to meet for two days and talk about oil and natural gas investment opportunities in eastern Europe and central Asia.

I would like to thank TPAO, the Turkish Petroleum Corporation, and its president and CEO Mehmet Uysal and his team for their strong support, which made this a memorable and successful event. I also want to thank our host society, the Turkish Association of Petroleum Geologists, and its president, Ismail Bahtiyar, as well as all of our sponsors for supporting this meeting.

I'd also like to recognize APPEX Committee chair Mike Lakin, the AAPG European Region Council and Jeremy Richardson, Anisha Patel, Fionn Devine and Ciaran Larkin, our AAPG team in London for a superb job organizing the conference.

\* \* \*

APPEX is an acquisition and divestiture (A&D) conference. As such,



CURTISS

**We seek to advance science to find oil and natural gas to fuel the world's growing need for energy. That is where the true value of what we do as petroleum geoscientists becomes evident.**

it is where science, technology and exploration creativity meet business opportunities.

It's about finding and making deals to explore and produce oil and natural gas.

Ours is fundamentally an applied science. As an association our purpose is to advance the science of petroleum geology.

But we don't do science for science's sake. We seek to advance science to

find oil and natural gas to fuel the world's growing need for energy.

That is where the true value of what we do as petroleum geoscientists becomes evident.

Connecting science and business is also the focus of a brand new product developed by DPA President Charles Sternbach, in cooperation with AAPG's education department: the AAPG/DPA Playmakers Forum.



Nearly 200 attendees from 29 countries attended the inaugural APPEX Regional 2012 event, held Nov. 8-9 in Istanbul, Turkey. The event was built on the success of the annual APPEX Global conference in London, an established forum for those looking to build partnerships and promote prospects.

(See accompanying stories, page 4.) Building on the successful Discovery Thinking forums at ACE and ICE, this one-day program will provide you with updates on hot plays around the United States, as well as build skills needed to succeed at an A&D conference, such as APPEX, or prospect expos, such as NAPE.

Charles has established a stellar lineup of speakers – and we're packing a lot of useful information into one day, as well as opportunities to network with other professionals. It's part of our ongoing commitment to demonstrate the relevance of our science and provide value to our members and prospective members.

\* \* \*

The AAPG/DPA Playmakers Forum is where oil finders gather. I urge you to visit the Education page at our website for more information and to register for this event. Go to [aapg.org/forum/playmaker/index.cfm](http://aapg.org/forum/playmaker/index.cfm).

And mark your calendars for our next A&D conference: The Global APPEX will be held March 5-7 in London.

Hope to see you there.

**DIVISIONS REPORT**

# DEG Enjoys a Successful Season of Outreach

By TOM TEMPLES, DEG President

Several AAPG meetings have taken place since the last issue of the EXPLORER was published, including the International Conference and Exhibition in Singapore, and the annual meetings for the Eastern Section (Cleveland) and GCAGS (Austin, Texas).

All had successful environmental sessions, and the turnout for each was excellent.

\* \* \*

The speaker for the joint DEG/EMD luncheon in Singapore was John Fontana, who spoke on the topic of "Water Well 'Problems' in Areas of Unconventional Resource Development: Appearances are Deceiving and Solutions are Many."

In his talk, John discussed ways to design a monitoring program to assess water quality and determine potential source(s) of contamination in water wells proximal to active drilling areas.

The good news: A link to his slide show can be found on DEG's website at [deg.aapg.org](http://deg.aapg.org).

This is only one example of the kind of information we are now including on our website to provide our membership with relevant research and current events associated with both industry and the environment. If you have not visited the DEG website recently, please take a moment to do so – I think you will find it useful and informative.



TEMPLES

**Coming: A new section of the website that will provide links and information regarding technical studies, research, data and "on-the-ground" happenings relevant to shale gas development.**

We also are building a new section of the website that will provide links and information regarding technical studies, research, data and "on-the-ground" happenings relevant to shale gas development.

\* \* \*

In addition to the recent AAPG meetings, I also had the distinct pleasure to attend the Integrated Petroleum Environmental Consortium (IPEC) conference in Denver at the end of October.

For those not familiar with IPEC, it is a joint effort by the University of Tulsa, the University of Oklahoma, Oklahoma State University and the University of Arkansas to facilitate reductions in the cost of compliance with environmental regulations, thereby increasing the competitiveness of the domestic petroleum industry.

The technical sessions ranged

in content from characterization and remediation of hydrocarbon spills to legal and regulatory issues in production.

The 2012 IPEC meeting agenda and abstracts can be found online at [ipecc.utulsa.edu/Conf2012/2012agenda.htm](http://ipecc.utulsa.edu/Conf2012/2012agenda.htm).

\* \* \*

The latest issue of our quarterly e-newsletter, "Spheres of Influence," is now out. One of our regular sections is called the "Good, the Bad and the Ugly," which is a collection of hyperlinks to the latest Internet-based articles regarding the petroleum industry that can be, well, you know, good, bad or ugly.

All DEG members receive the e-newsletter, and all issues are archived on the DEG website.

\* \* \*

As you are no doubt aware, several movies have addressed the topic of



hydraulic fracturing ("fracing") in recent years. The latest, by Matt Damon, is called "Promised Land" and due to premiere at the end of December.

How it portrays the oil industry remains to be seen, and it is interesting that the film is being partially financed by the government of Abu Dhabi.

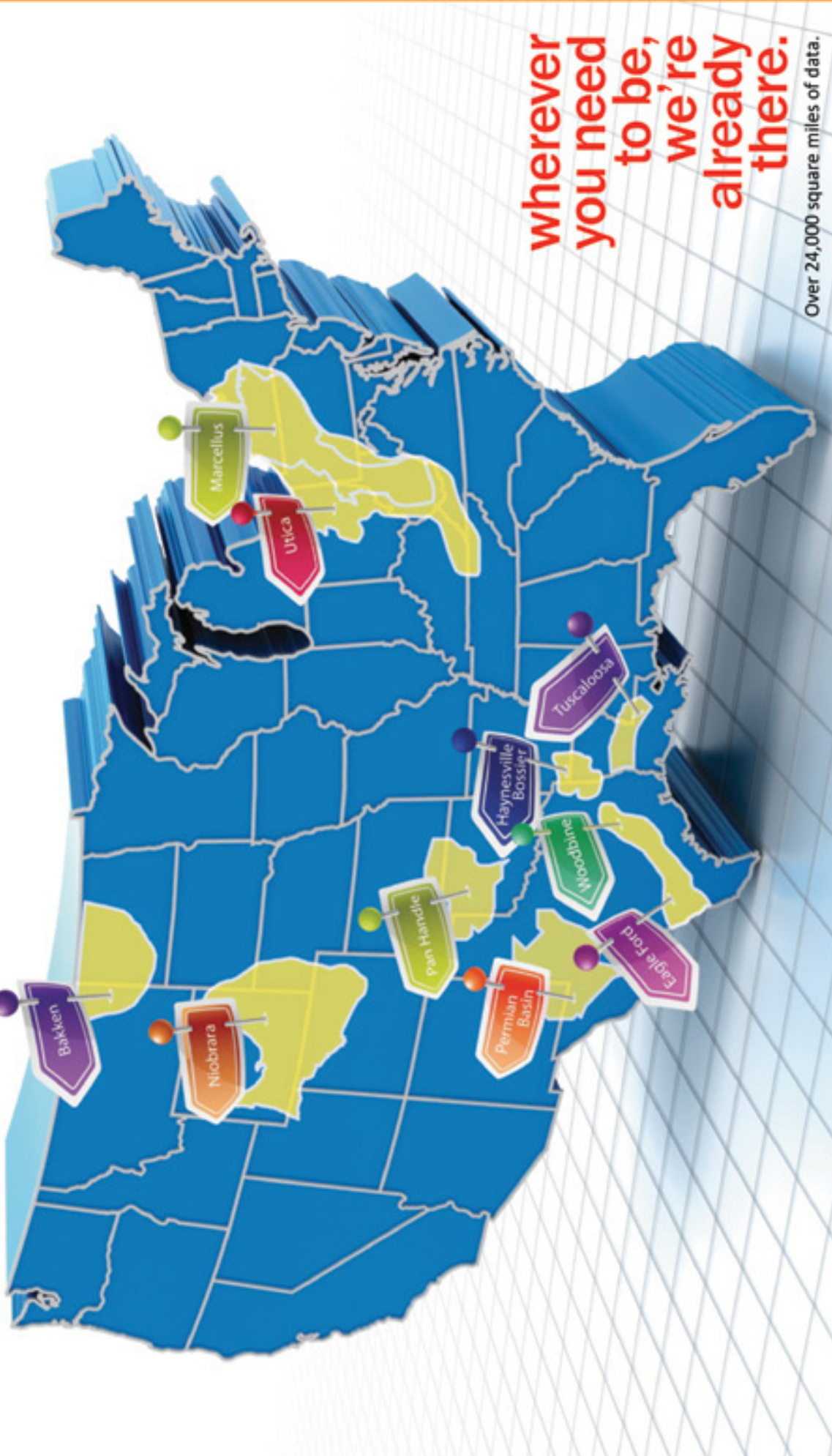
Please continue to spread the truth about hydraulic fracturing to the public. Let's not bury our heads on this issue so vital to the petroleum industry. The United States has the opportunity to become energy independent in the near future all because of the reserves that this technology has made accessible here at home.

\* \* \*

DEG hopes that you remain engaged in the environmental aspects of our work.

If you are not already a DEG member, consider joining to become involved in the environmental side of the energy industry.





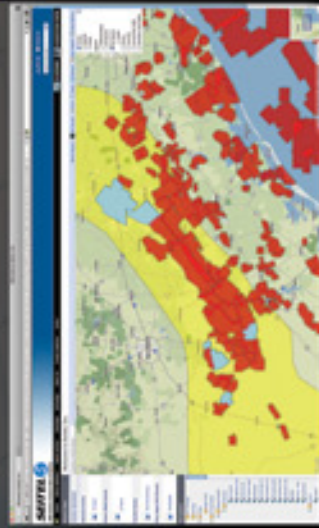
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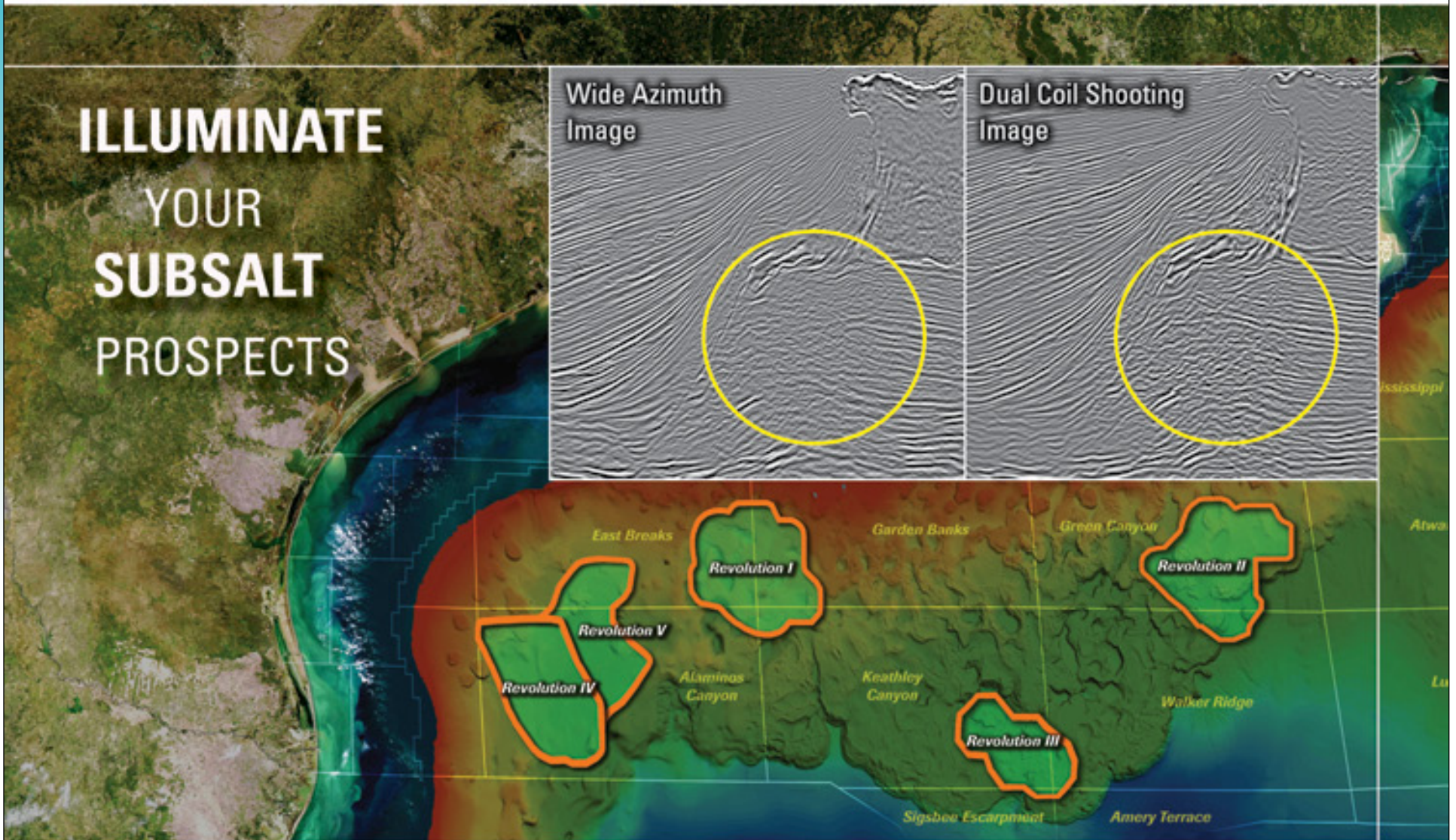
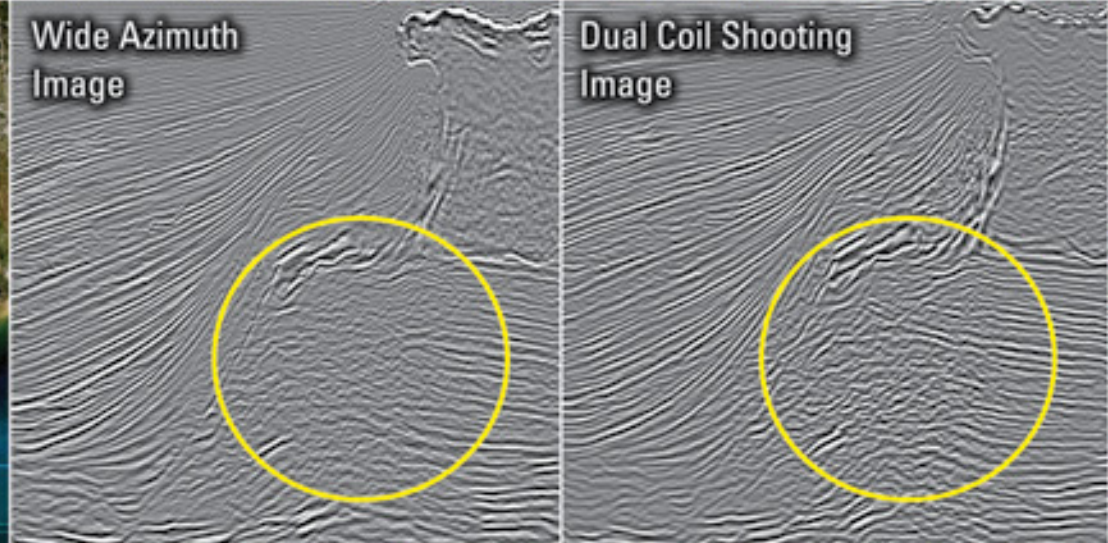
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To learn more about the Revolution multiclient surveys and Dual Coil Shooting acquisition, call +1 713 689 1000 or e-mail us at [multiclient@slb.com](mailto:multiclient@slb.com).

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