

AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

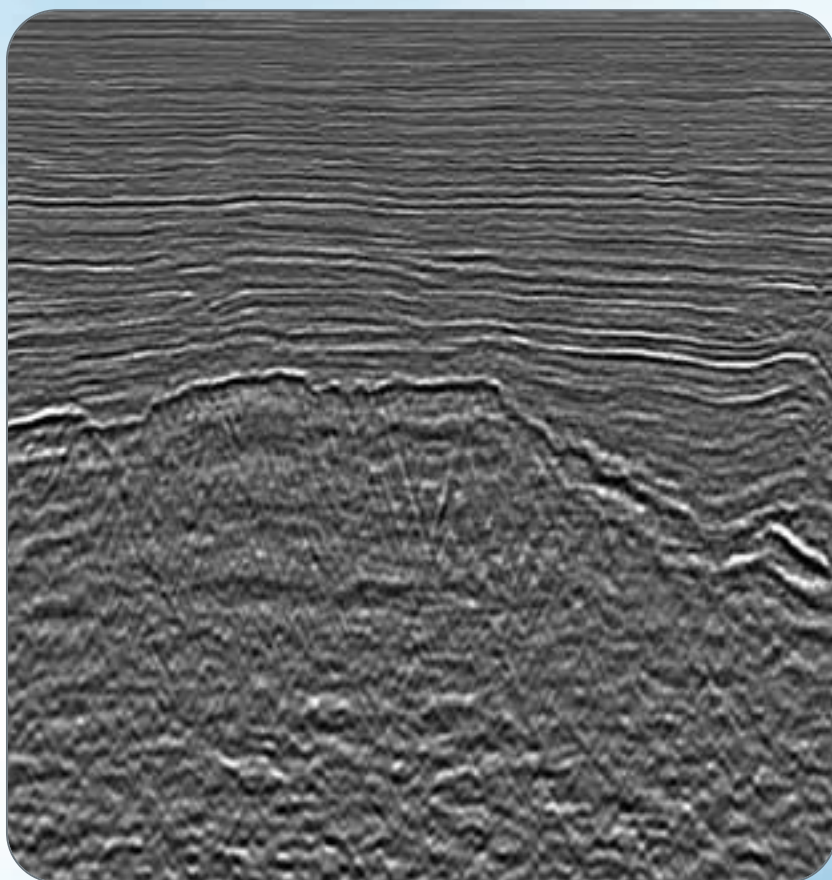
EXPLORER

JUNE 2009

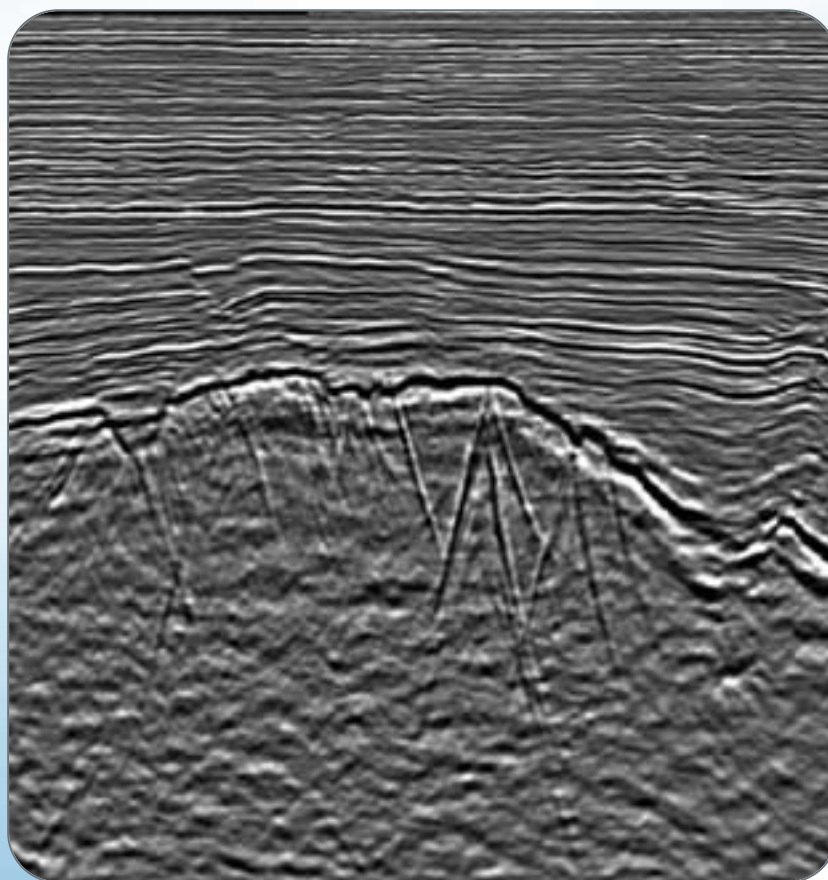
Rocky Mountain Way
AAPG turns the spotlight on Denver



Commitment to the Very Core



Kirchhoff PSDM section



Controlled Beam PSDM section



CHALLENGE

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

SOLUTION

- ➔ The data was reprocessed using the CGGVeritas Controlled Beam Migration algorithm for the velocity model building and the final migration.

RESULTS

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

Please come visit us in Denver at the AAPG Annual Convention & Exhibition, booth #827.



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On the cover: One of the benefits of attending a meeting in Denver is being so close to so much geologic beauty and natural splendor. Colorado's Front Range provides those in Denver with a gateway to terrific getaways – including to nearby Mount Evans, this month's cover subject. AAPG's Annual Convention and Exhibition will be held in Denver June 7-10. Photo courtesy of Matt Inden/Weaver Multimedia Group.

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Now here's something you don't see everyday ... and just what *is* this giant bear doing at the Denver Convention Center? You can provide your own answer to that question, but we know what YOU can do at the Denver Convention Center: This month you can be part of AAPG's 94th Annual Convention and Exhibition, which will be held there June 7-10. A large and diverse technical session representing expertise from around the world has been gathered for the meeting, which means whatever your interest or specialty, you'll find it covered there. See story on page 10 (and throughout this EXPLORER) for more details.



Photo courtesy of Denver Metro Convention & Visitors Bureau

PRESIDENT'S column

A Year of 'Advancing The Ball' – Together

By SCOTT W. TINKER
Just when I begin to know my way around the place ...

* * *

To:

- ✓ My colleagues and friends on the Executive Committee.
- ✓ The Executive Committee members of our six Regions, six Sections, three Divisions and affiliated and sister societies.
- ✓ Those who conduct science, lecture and publish in the broad variety of venues offered by AAPG.
- ✓ The chairs and members of some 40 AAPG committees.
- ✓ Our student chapters and their faculty sponsors.
- ✓ Those who organize and run the myriad of meetings, workshops, conferences, seminars, field courses and beyond.
- ✓ Our sponsors, exhibitors and advertisers.
- ✓ Trustees of the AAPG Foundation.
- ✓ The talented staff in Tulsa and our expanding offices globally.
- ✓ And all of our members worldwide.

Together we have moved the ball down the field a bit this year, and it has



Tinker

been an honor to serve you. Thank you for your trust and your friendship.

AAPG is in great hands with John Lorenz and the incoming Executive Committee.

* * *

I tell my kids to work hard, do right and show thanks, and the rest will usually take care of itself. I think I actually believe that.

Life is a trip that we only get to take once. Pour your passion into everything that you do and everyone whom you touch.

Build bridges every chance you get. The world will be better for it.

* * *

We are very lucky to be geologists! See you on the rocks ...

Rensink, Guzman, Houston Elected

David G. Rensink, of Houston, was voted president-elect by the AAPG membership for the 2009-10 term and will serve as AAPG president in 2010-11. Rensink recently retired from Apache Corp.

Also elected were:

Vice President-Regions

☐ **Alfredo E. Guzman**, consultant, Veracruz, Mexico.

Secretary

☐ **William S. Houston**, Samson, Denver.

Both the vice president-Regions and secretary positions serve for two years.

Survey and Ballot Systems, which handles the AAPG election, noted that 34.3 percent of the eligible voters

participated in the election, with 52.4 percent voting via the AAPG Web site and 47.6 voting by paper ballot.

The newly elected officers will begin their duties on July 1, serving on an Executive Committee headed by **John C. Lorenz**, president of Geoflight LLC in Edgewood, N.M.; vice president-Sections, **W.C. "Rusty" Riese**, geoscience adviser, BP America Production Co., Katy, Texas; treasurer **Kay L. Pitts**, reservoir management process analyst, Aera Energy, Bakersfield, Calif.; and **Gretchen M. Gillis**, in her third of a three-year term as elected editor.

Also new on the committee is **Stephen Sonnenberg**, of the Colorado School of Mines, who will assume the chairmanship of the House of Delegates.

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Energy, environment, economy inextricably linked**Bridge to Energy Future Is Vital**

By SCOTT W. TINKER

The bridge from a fossil-energy present to an alternate-energy future will span many decades – and as with the building of any bridge, a solid foundation is vital.

A well-designed energy bridge will move the world ahead in a reasonable fashion; accelerating an energy transition as the result of a poorly informed public enabling politically naive policies could – likely would – lead to global energy, economic and consequently environmental instability.

Building the energy bridge will not be simple; tough challenges rarely are. The process will involve:

- ✓ The delicate interplay among energy, environment, economy and public energy policy.
- ✓ A necessary partnership among government, industry, academia and non-government organizations.
- ✓ Parallel investments in and favorable policies toward fossil energy and alternatives.
- ✓ Compromise and wisdom from leadership.

The Three E Waltz

Energy, economy and the environment are inextricably linked.

Oil price, as an historical proxy for energy price, has a known relationship to economic health. In the United States, significant oil price increases are often followed by economic recession, as observed following the oil price spikes in 1973, 1979, 1990 and 2008. Further, global data show a strong positive correlation between per capita energy consumption and per capita income.

Energy price has a known impact on consumer behavior. Using oil as an example, when the price of oil is high, demand for oil dampens.

This was most notable from 1973-84, when global oil demand, which had been rising steadily in prior decades, was dampened considerably as a result of steep oil price increases driven by the OPEC supply cutoff to the United States. Although global demand for oil again increased from 1985-2005, the rate of increase was considerably lower than prior to 1973.

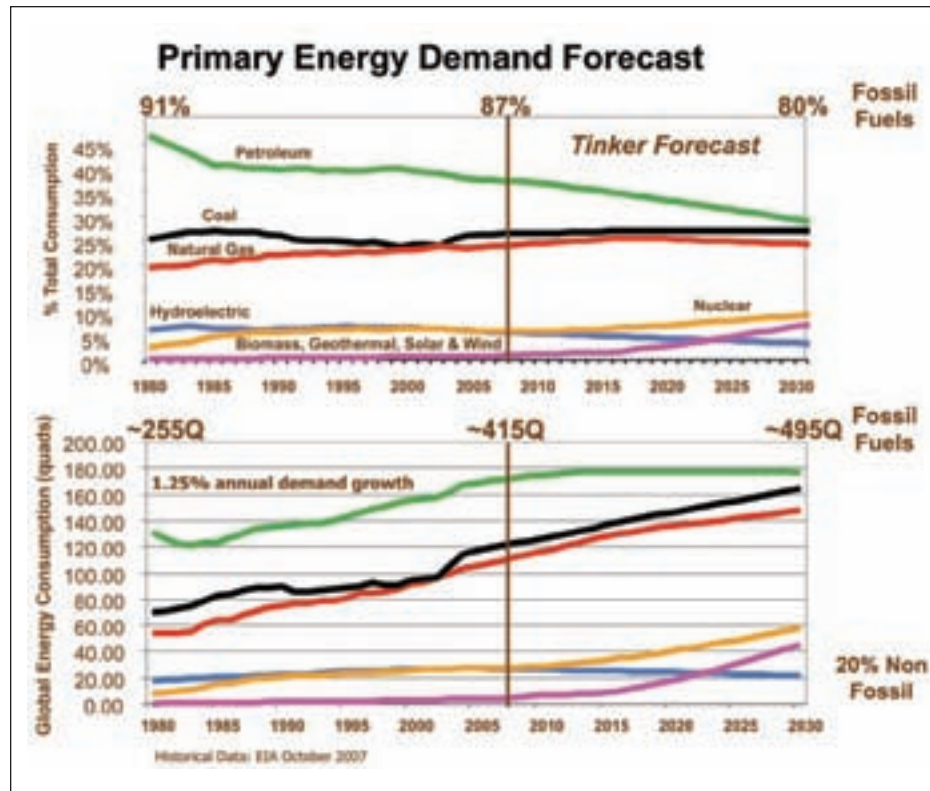
In other words, the oil price shock of the early 1970s changed consumer behavior. Importantly, oil, as a percentage of global energy, peaked in 1979 at just under 50 percent and has been decreasing since that time.

The world went through another significant oil price increase from 2002-08, this time driven largely by investor speculation combined with increased demand from developing nations – and as expected, in 2007 and 2008 global demand for oil dampened. It is likely that the slope of the forward demand curve for oil, relative to the 1980s and 1990s, will again decrease, perhaps even plateau, as consumer behavior for energy changes and oil continues to decline as a percentage of global energy.

A lesser-known relationship is between energy and the environment – when the world is in recession, as it is today, less money is spent on environmental action.

Just read the newspaper. In various ways nations are saying, “We cannot afford environmental investments – especially those related to atmospheric reduction of anthropogenic carbon.”

Healthy energy systems are related to



The top graph depicts percentage of global energy and the bottom graph depicts actual units of energy consumption in quadrillion Btus. Colors represent energy types and are labeled in the top figure. Actual data (EIA, 2007) are to the left of the vertical line; to the right are my forecasts to 2030.

healthy economies, which in turn allow environmental investment. Unbalanced attention, positive or negative, on any of the three Es will throw the system out of balance.

The Energy Bridge

Fossil fuels represent 87 percent of today's global energy mix. Under any stable scenario the foundation of an alternate, lower carbon energy future will be built with fossil fuels.

The irony should be very apparent. Those nations that do not understand – or choose to reject – this reality will be left behind.

Looking out to 2030, I call for the percentage of fossil fuels to decrease to 80 percent, with a greater proportion of natural gas and lower proportion of oil relative to today.

Forecasts, simple or elaborate, require fundamental underpinnings. My simple forecast is underpinned by resource estimates and economics; we have the coal, oil, natural gas, water and uranium resources to support my forecast to 2030, and these sources of energy likely will remain the most affordable.

New conventional oil and natural gas frontiers include ultra-deep water, the Arctic and other extreme operational environments.

As existing and new conventional reserves begin to decline, unconventional oil and natural gas resources – perhaps someday including natural gas hydrates – will represent a growing part of the future fossil energy mix. Clean and economic extraction of these new reserves will be enhanced by industry-government-academic partnerships.

The fossil bridge must embrace energy efficiency, including cars and light trucks, insulation and lighting, appliances, industrial uses and beyond. Net energy savings is not one-for-one with efficiency owing to the rebound effect – we tend to use more units as

each unit becomes more efficient – but that effect diminishes with scale and time.

Diversification of the global energy portfolio is critical, particularly for transportation. Options to conventional oil include unconventional oil, coal and natural gas converted to liquids, and certain biofuels. There likely also will be a growing electrification of the vehicle fleet. Although it is difficult to know, thoughtful studies indicate that plug-in hybrid vehicles represent a reasonable transition path to a more efficient car and light truck future.

Increased electricity diversity is important. Cleaner baseload generation options include coal and natural gas with sequestration (CCS), offering the greatest promise for large-scale removal of carbon from carbon-fueled, stationary sources of CO₂.

Nuclear technology has advanced significantly, thanks to progress in Europe and Japan, and nuclear energy will play an important global role. This will require existing and new uranium feedstocks; policy that reduces the regulatory and permitting roadblocks in some geopolitical regions; real options for waste storage; and the will to address the legal posturing designed simply to add costly delays.

My forecast accelerates the growth of non-nuclear, non-hydro renewable energy more quickly than any other source, doubling in output approximately every seven years; no simple task. Renewable energy is not limited by resource – there is plenty of wind and sun – but rather by energy density. Quite simply, wind, waves, tides, biomass and solar are low-density “fuels,” and they require a tremendous amount of infrastructure and earth surface area, given current technology.

A grand challenge in energy involves step changes in energy (electricity) storage and transmission. Battery technology has advanced, but batteries

are still relatively inefficient, expensive and chemically intensive, and thus represent an environmental challenge, both in terms of manufacturing and ultimate disposal.

Other renewables, such as large scale solar PV (photovoltaic), face environmental challenges related to the chemical manufacturing processes and large scale disposal challenges. Large, non-chemical “batteries” such as pumped water and compressed air offer interesting promise and opportunity for geological input, but are still regionally constrained in terms of access to subsurface caverns or adequate water supplies.

Technology advancements required to scale-up alternative energy sources to meet massive and growing global electricity demand will most certainly continue to develop.

Many great ideas are being considered, and nanotechnology research offers new frontiers – but it is vital to recognize that large-scale advances will require invention, new materials, substantial investment and well-considered policy to foster private sector, cost-competitive solutions.

Markets have and will continue to weigh heavily on commercial deployment.

Policy for Security

Alternate energies represent only a small percentage of today's energy mix, not because of lack of political will or subsidies, but instead because of the fundamentals of economics, kinetics, thermodynamics and technology. Policies (and policy makers) that attempt to overly accelerate these limiting fundamentals have fallen, and will continue to fall short.

In terms of energy policy, energy security should not be confused with energy independence, which hints of unhealthy nationalism. Secure energy is affordable, available, reliable and clean.

A global international energy roadmap to achieve security will:

- ✓ Address energy efficiency and infrastructure.
- ✓ Diversify fuel options.
- ✓ Integrate energy, economy and the environment into policy.
- ✓ Strengthen global energy trade and investment.
- ✓ Broaden dialogue between developing and developed nations.
- ✓ Enable global work force balancing opportunities.

If a price is to be set on carbon, it must be transparent, predictable, reasonably stable and coordinated among major developing and developed nations, especially in terms of wise use of carbon-derived revenues. Cap-and-trade schemes struggle to meet any of these criteria; a carbon tax comes closer.

* * *

The challenges facing the world are great. Wise leaders will build technological, scientific, economic, political, cultural and social bridges, remove walls that inhibit progress, embrace scientific debate and create policy that is guided, but not dictated, by scientific forecasts.

I am confident that visionaries will rise to meet these challenges – and among these will be geoscientists! That thought motivates me daily. □



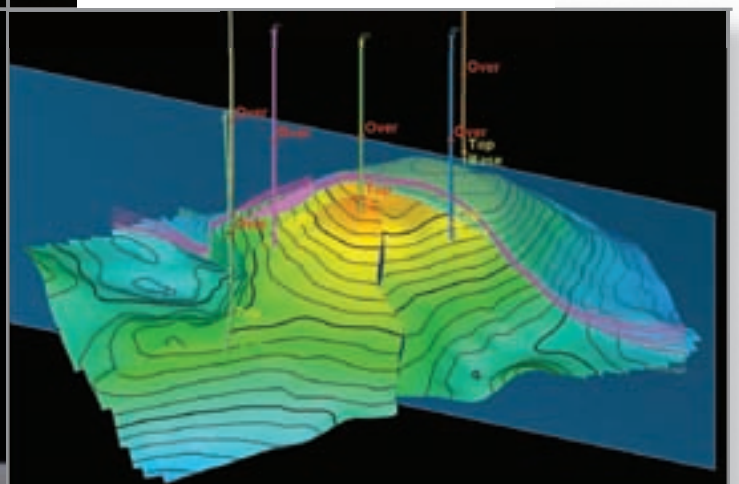
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*Job market unshaken by volatility***Salaries Show Slight Increases**

While the last year saw peaks and valleys for energy prices, salaries for petroleum geologists were relatively steady with some increase, according to the 2008-09 annual AAPG Salary Survey.



Ayling

An overall weighted average pay increase of 2.04 percent was charted in 2008-09. The three previous annual salary surveys totaled a whopping 35 percent pay increase.

It took a drop in oil price from \$145 to \$50 last year to slow the pay train.

"The volatility and uncertainty of petroleum prices had a dampening effect on salaries," said Mike Ayling, of MLA Resources in Tulsa, who has conducted the annual salary survey for AAPG since 1981.

Despite the quick fall, Ayling said the job market has not destabilized.

"Limited layoffs have occurred – largely in cutting consulting help," he said. "There was less job movement, fewer raises and lower bonus expectations as the year progressed."

The 0-2 and 3-5 year experience levels showed little change, but those categories contain relatively few individuals, Ayling said. He also noted that in 2008-09, over 46 percent of the salaries that were reported represent geoscientists with over 20 years experience.

Mid-experience salaries had a more normal progression than last year, while 20-plus year salaries showed a modest 5.4

2008-09 Geological Salary Survey

YEARS EXPER	HIGH	AVERAGE	LOW
0-2	\$ 95,000	\$ 83,600	\$ 58,000
3-5	147,000	108,000	75,000
6-9	153,000	118,400	90,000
10-14	155,000	121,900	100,000
15-19	185,000	139,400	118,000
20-24	260,000	176,800	138,000
25+	250,000	171,700	105,000

2008-09 Average Salary By Degree

YEARS EXPER	B.S.	M.S.	Ph.D.
0-2	\$ 73,000	\$ 88,800	\$ 95,000
3-5	88,300	112,000	147,000
6-9	90,000	141,000	105,200
10-14	102,500	122,900	155,000
15-19	124,300	166,500	134,900
20-24	147,500	172,300	215,000
25+	162,300	179,000	150,000

Historical Average Salary

YEARS EXPER	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
0-2	\$59,700	\$64,000	\$65,000	\$65,600	\$67,800	\$74,400	\$82,200	\$82,800	\$83,600
3-5	66,000	67,500	71,200	67,700	75,600	81,300	89,600	107,800	108,000
6-9	74,200	74,500	78,300	75,700	78,800	95,400	98,500	121,100	118,400
10-14	89,400	95,000	96,600	91,900	107,500	114,400	111,500	119,800	121,900
15-19	100,600	99,400	102,500	102,500	116,000	119,600	141,000	151,600	139,400
20-24	111,700	111,600	113,900	118,100	112,800	139,000	155,000	167,400	176,800
25+	117,300	124,000	126,900	125,100	128,300	134,100	149,900	162,800	171,700

percent increase, Ayling said.

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

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

The purpose of the survey is to provide a yardstick for those interested in

assessing their compensation, and Ayling strongly feels that compensation is often a secondary consideration when evaluating overall job satisfaction.

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

productive beyond the boundaries of any specific country.

Ayling added that many ex-pats are paid U.S.-based salaries, while the national oil companies opt to pay compatriots on a different, lower scale.

As for the job market, Ayling said, "Most everyone remains very conservative in their staffing decisions. I think that's what we can expect until there is some price recovery – especially gas." □



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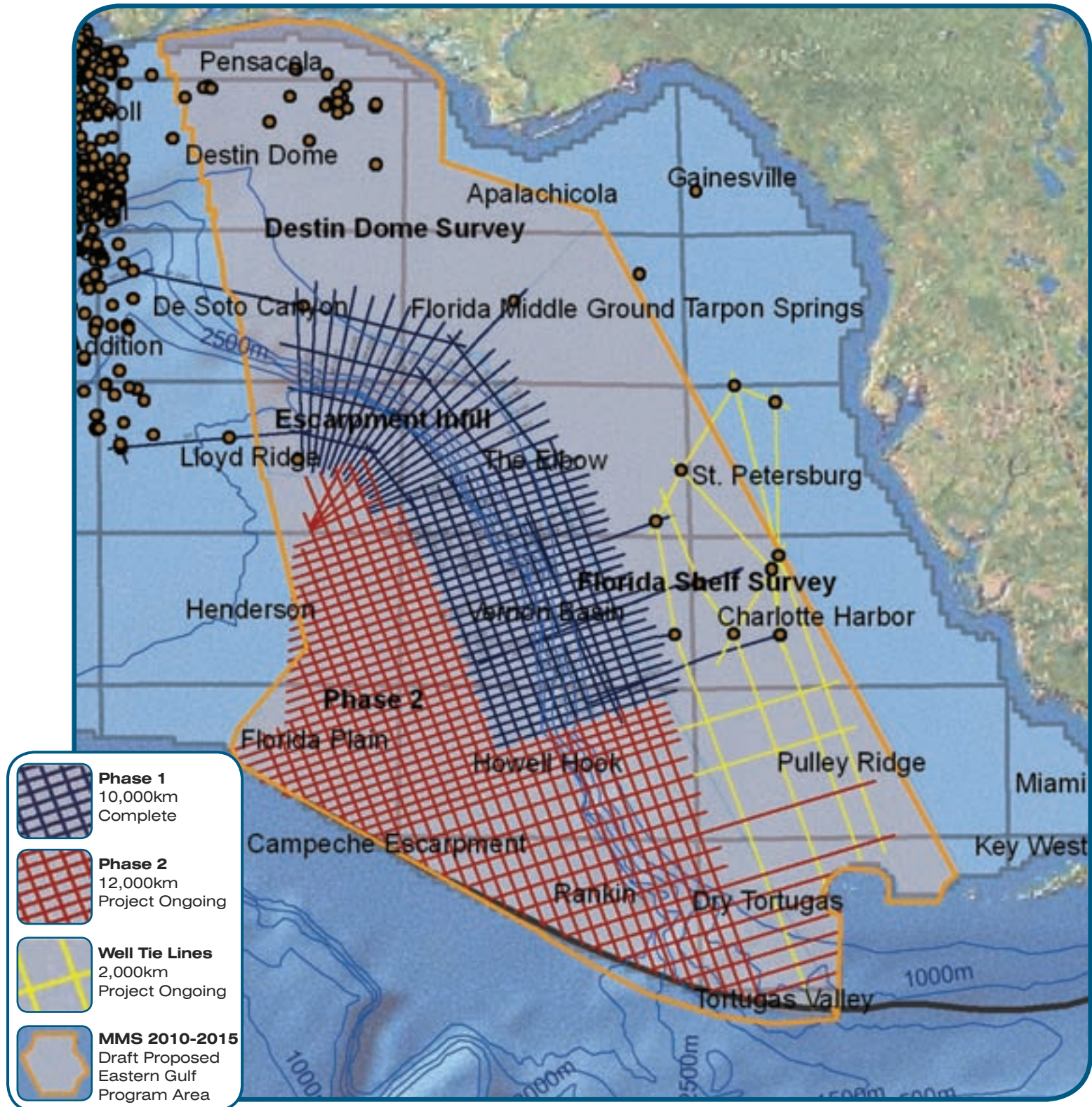
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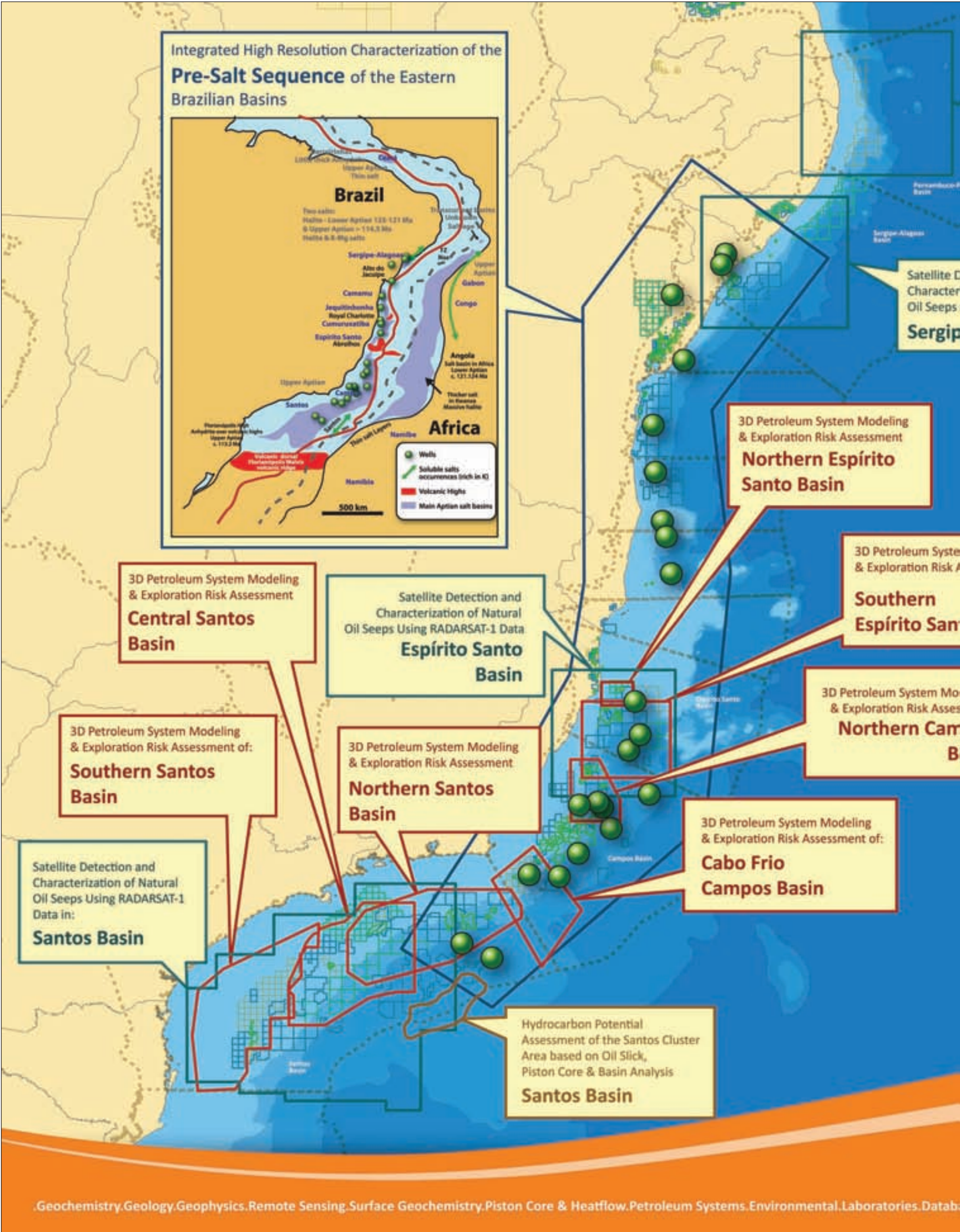


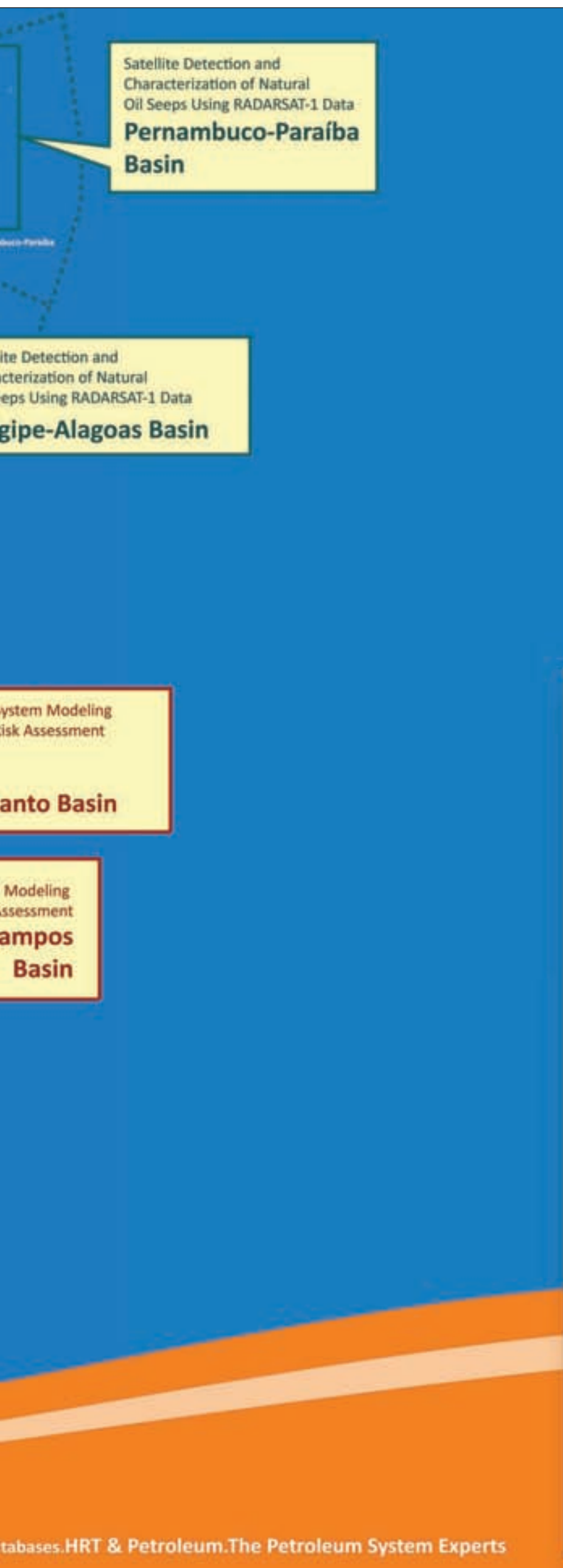
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Petroleum System Summary of Brazilian Offshore Basins.

Petroleum System Summary of Brazilian Onshore Basins.

Temperature of Petroleum Formation from Kinetic Properties of Oils from Santos, Campos and Espírito Santo Basins, Brazil.

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Annual convention starts June 7**‘Exceptional’ Is Denver’s Big Draw**

By VERN STEFANIC
EXPLORER Managing Editor

AAPG is heading back to the Rockies for an annual meeting that offers the latest in science and technology from around the world.

The 94th AAPG Annual Convention and Exhibition will be held June 7-10 in Denver at the Colorado Convention



Ray

Center – and organizers believe this is an event that will be the right meeting at the right time.

“We have an outstanding technical program with exceptional highlights,” noted R. Randy Ray, this year’s general chairman. “The

spectrum of practical science covered by our technical sessions spans geology, seismic and engineering techniques.

Specifically, he pointed to “shale gas, salt tectonics, seismic depth imaging of structure, petroleum systems, carbonate reservoirs, sequence stratigraphy, fracture mapping, deepwater discoveries – we have it all, with the latest advances and ideas.

“As a professional geologist,” he continued, “you must see the newest knowledge on emerging U.S. shale gas plays in the Haynesville, Marcellus, Pearsall, Barnett and Gothic plays – including not only the source and reservoir characteristics, but also the seismic depth imaging of the structure



Photo courtesy of Ron Ruhoff, Denver Metro Convention and Visitors Bureau

Colorado’s famed Maroon Bells, near Aspen – another good reason to head to Denver.

and then the micro-seismic fracture mapping.”

In fact, the technical program features more than 1,000 presentations, field trips, short courses and special forum events, ranging in subject matter from a management forum that deals with “Challenges for Global Energy Demand” to a multi-Division energy forum on carbon sequestration to two forums about the science and implications of global climate change.

Other highlights include:

✓ An All-Convention luncheon featuring T. Boone Pickens, who will discuss “The Future of Energy.”

✓ The Michel T. Halbouty Lecture, featuring Guilherme de Oliveira Estrella, managing director for E&P for Petrobras, who will discuss “Breaking Paradigms: Giant Discoveries in Brazil.”

✓ A talk by Denver mayor – and AAPG member – John Hickenlooper, who will address the DPA Luncheon on Tuesday, June 9.

✓ This year’s “Discovery Thinking”

Forum, when seven more of the “100 Who Made a Difference” will again share their stories and insights into finding success in the face of enormous challenges. (See related story, page 26.)

✓ Results of the AAPG survey on work force retention will be presented at the AAPG Professional Women in Earth Sciences Luncheon, set Wednesday, June 10. (See related story, page 52.)

✓ More than 200 exhibitors in the giant exhibits hall, showcasing the latest in technology, science and literature.

The meeting will officially begin with the opening session, where this year’s Sidney Powers medalist Marlan Downey will lead the list of 40 people who will receive AAPG honors and awards. The ceremony, which officially begins at 4 p.m. Sunday, June 7, in the Colorado Convention Center’s Four Seasons Ballroom, will include pre-show entertainment and music that begins at 3:30 p.m., featuring the award-winning Rocky Mountain Children’s Choir.

The program also will feature welcoming remarks from General Chairman Randy Ray; the presidential address from Scott Tinker; and remarks from Downey.

The Icebreaker follows in the exhibits hall. Technical sessions begin Monday morning, June 8, and Ray suggests that attendees be prepared to do some serious moving.

“If you don’t want to be at least three places at once,” he said, “then we haven’t done our job.” □

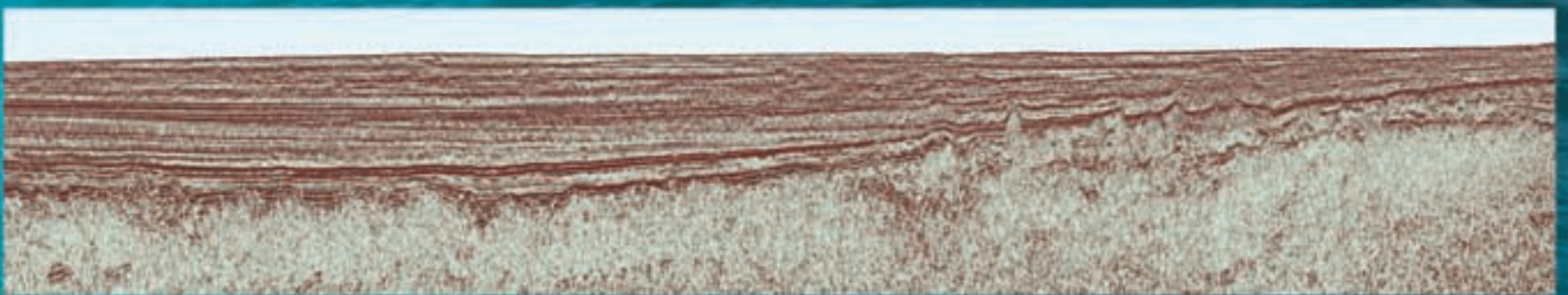
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*Marlan Downey: geologist, executive, thinker, leader***Blend of Talents Bedrock for Medalist**

By DAVID BROWN
EXPLORER Correspondent

Imagine you are about to accept the Sidney Powers Memorial Award, the highest honor AAPG can bestow. The award goes only to those individuals who have made "the most distinguished and outstanding contributions to petroleum geology."

Would you be:

- (a) Reflecting on a successful career, or ...
(b) Thinking about urban electricity and the sewers in San Antonio?

There's no suspense.

Everyone is going to choose (a) except Marlan W. Downey.

Maybe that helps explain why Downey will receive the Sidney Powers Medal in June at the AAPG Annual Convention and Exhibition in Denver.

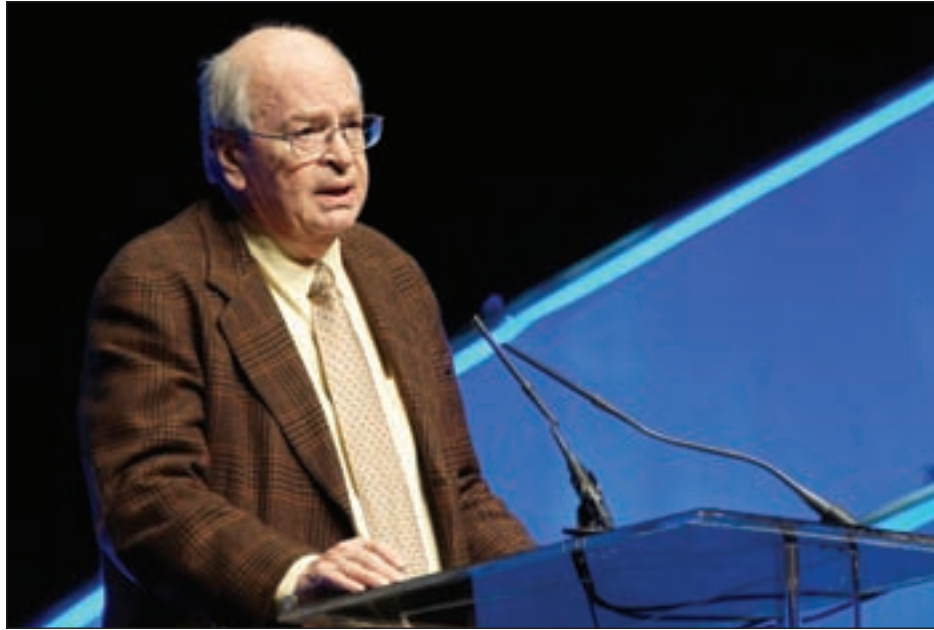
Or, consider the way he began his studies in geology.

Downey had already earned a degree in chemistry before he joined the Army, where he served in the Philippines and Korea.

"When I came back from the service in Korea, I was actually categorized as a 'disabled veteran,'" after a bout with malaria and a serious ear infection, he said.

He entered the University of Nebraska on the GI Bill, but felt uncomfortable working in the confined area of the school's chemistry lab, after U.S. Army service in outdoor conditions.

Aptitude testing by the Veterans'



Downey: "A peculiar blend of quantitative talents and visualization talents."

There are dozens – maybe dozens of dozens – of reasons why Marlan Downey is receiving AAPG's top award this year. Here are a few of those reasons.

A member since 1957, Downey has served on several AAPG committees and has chaired the Corporate Liaison, OTC Technical, Corporate Advisory and Budget committees. He also has chaired the Advisory Council and since

2007 has chaired the Global Corporate Structure Ad Hoc Committee.

He is an AAPG Foundation Trustee Associate; organized three Hedberg Research Conferences; was a two-time AAPG Distinguished Lecturer; wrote the EXPLORER's Business Side of Geology column; won the Robert H. Dott Award; is an Honorary Member; and in 2000-01 was president of AAPG.

Administration showed that Downey possessed "a peculiar blend of quantitative talents and visualization talents," he recalled.

The VA recommended that he choose a professional field where he could make full use of his strengths – something like architecture or geology.

"So I gave geology a trial," Downey said. "The chairman of the department let me transfer from chemistry to geology 'with deficiencies' – the main one being that I had never taken a course in geology. But he let me violate the rules."

A Higher Calling?

After earning a master's degree in 1957, he needed to land a job as quickly as possible.

"I had married and we were expecting a child. And the GI bill money was running out," he explained.

Shell was hiring and Downey signed on, even though he knew little about Shell "other than they were considered a 'class' sort of company."

"Shell was one of the few companies that liked to hire really smart people," he said. "They didn't care if you were an engineer or a chemist or a mathematician. They figured they could get you in and train you."

Downey found a spot in Shell's leading operating area at the time. Later on, "I

See [Downey](#), page 14

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Downey

from page 12

liked to tell people that I started at the top and worked my way down," he said.

By 1967, he had become Shell's youngest chief geologist. In Downey's estimation, he never had it better.

"The best job I ever had was when I became chief geologist for Shell," he recalled. "It was the top technical position in geology there.

"I loved being a chief geologist," he said, "but they kept pushing me into being a manager."

The Lion Roars

In the late 1960s, Downey worked on promoting and applying Shell's bright-spot seismic technology, a unique edge for the company at the time.

"I never bet against the technical, innovative ability of first-class minds – I think there are all sorts of problems we can solve if they involve technical innovations."

Then he began a rapid climb through the management ranks, starting as an exploration manager and becoming a Shell vice president, then serving as president for a newly formed Shell international subsidiary – Pecten.

Downey retired from Shell in 1987 and founded Roxanna Oil, a company that held nearly three million acres in Syria and the Philippines, and today has an interest in more than 500,000 acres in unconventional resource plays in the

United States.

Three years later, Arco asked him to become senior vice president of exploration for Arco International.

He was named president of that company and a senior vice president and executive adviser for Arco a year later, going on to build a first-class international exploration team.

And that's less than half of the Marlan Downey story.

Because, just as his abilities joined

analytics with visualization, his interests have included both the business and the science side of petroleum geology.

"I remember going to the first conference on geopressure given by AAPG," Downey said. "Then I became interested in geochemistry and I participated in the famous Gordon Conferences."

In 1982 he organized and chaired the first Hedberg conference on seals for hydrocarbons. With AAPG members Pete Rose and Ed Capen, he convened the first Hedberg conference on understanding risk in 1990.

He was instrumental in developing the Pratt Conference on Future Petroleum Provinces and the AAPG's first conference on a national energy policy. Along the way, he wrote numerous papers and articles and several books.

An AAPG member for more than 50 years, Downey served as president of the Association in 2000-01, has been a member of AAPG's executive and advisory councils and is an AAPG Foundation Trustee.

Still Going ...

In his written response to the Powers Award announcement, Downey credited his success to his family, friends and associates.

His family remembered many of Downey's highlight moments through the years.

For instance, the time he drove straight through the family's garage door.

In fact, they recalled, he did that twice.

Or the time he was trying to start a campfire on a family outing, decided to use a cup of gasoline – and set himself on fire.

Yes, memories. And they also recounted how he treated employees at Shell and Arco fairly on their abilities, putting the first female geologist in charge of a Shell helicopter field crew and the first female geophysicist on a Shell seismic boat, and promoting female managers to positions of leadership in international operations.

Today, Downey has turned his thoughts to long-range, sustainable energy for municipalities.

"There I'm looking at the peculiar, local circumstances in each municipality," he said. "For instance, San Antonio is putting in a system to capture methane from their sewers. That methane is being used to power electric generators."

The new challenges of energy will require scores of well-trained and capable geologists, in addition to engineers and physicists and other scientists, Downey believes.

As a long-time participant in and observer of the energy industry, he's amazed that so many people seem to have forgotten the cyclical and progressive nature of the business.

"Getting old has kind of snuck up on me," Downey said. "I find now that I'm one of the few active people born in the Depression.

"You've got to manage for the long-term," he continued. "And the long-term says, 'Tomorrow will be different.'"

All in all, he's optimistic about the future of the industry.

"I never bet against the technical, innovative ability of first-class minds – I think there are all sorts of problems we can solve if they involve technical innovations," he said.

And he's solidly behind the continuing importance of geology.

Downey noted that two of his older children both became geoscientists and his youngest son is now a senior studying geology at Southern Methodist University.

"You can tell we think geology is the future," he said. □

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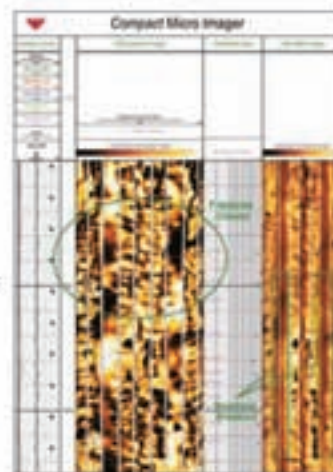


Image data obtained in a horizontal CIM (Coal Bed Methane) well with CIM on Well Shuttle.

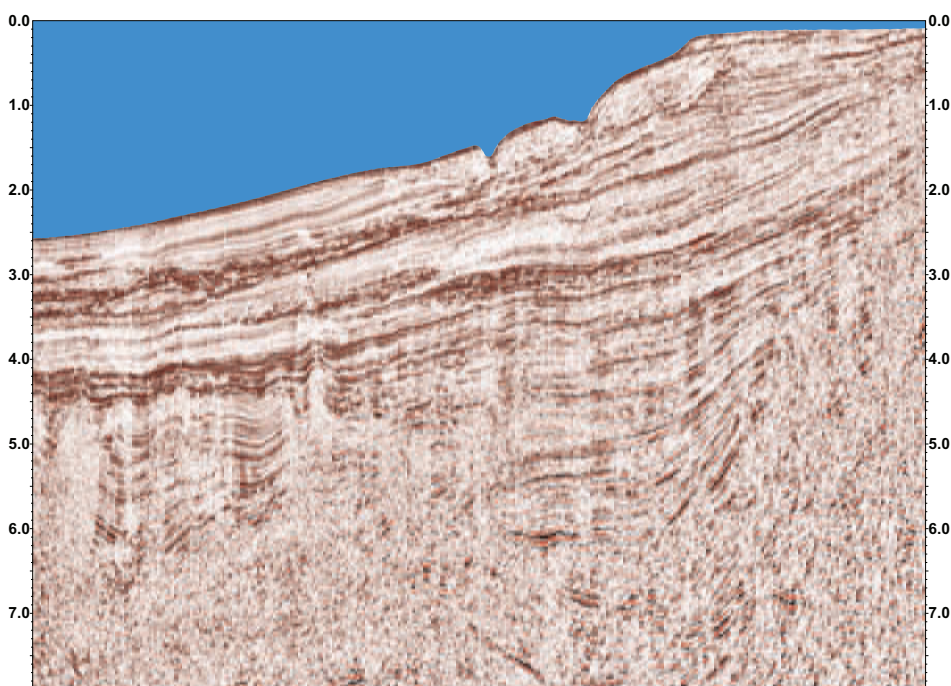
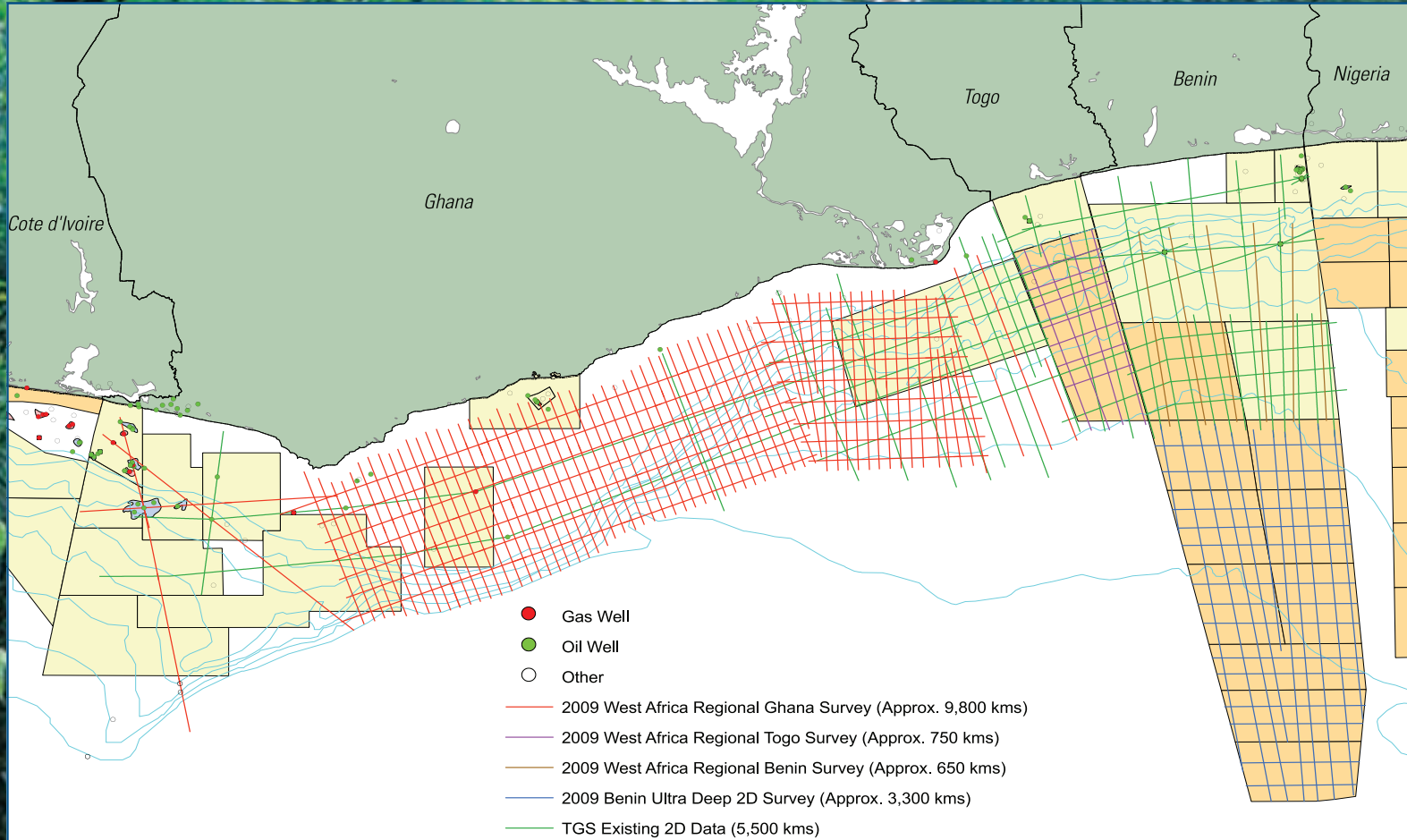


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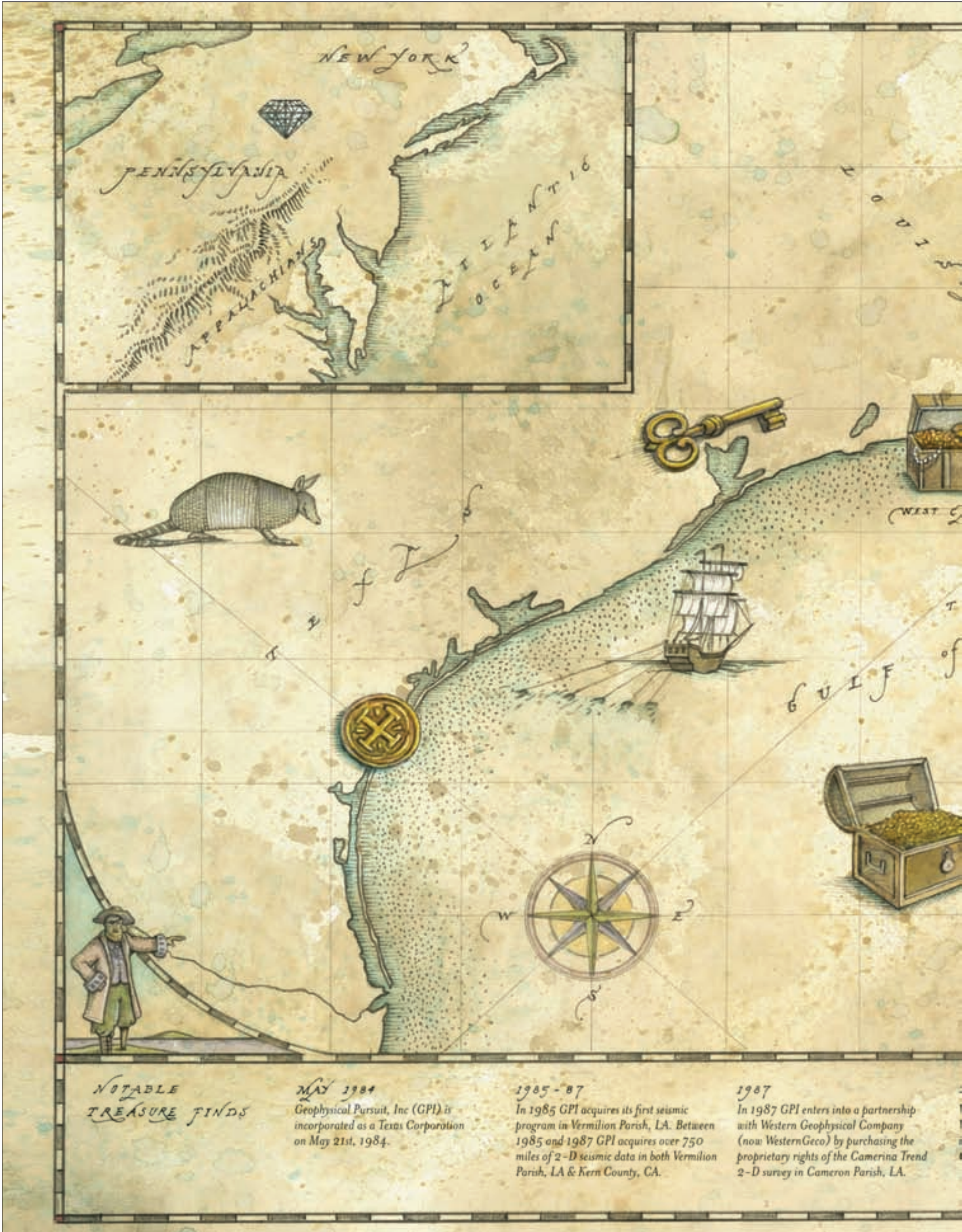


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*NOTABLE
TREASURE FINDS*

MAY 1984
Geophysical Pursuit, Inc (GPI) is incorporated as a Texas Corporation on May 21st, 1984.

1985-87
In 1985 GPI acquires its first seismic program in Vermilion Parish, LA. Between 1985 and 1987 GPI acquires over 750 miles of 2-D seismic data in both Vermilion Parish, LA & Kern County, CA.

1987
In 1987 GPI enters into a partnership with Western Geophysical Company (now WesternGeco) by purchasing the proprietary rights of the Camerina Trend 2-D survey in Cameron Parish, LA.



1995
 Within the ongoing partnership with Western Geophysical, GPI commences its first 3-D survey: 385 square-mile Galveston Bay.

1997 - 99
 Partnering with Petroleum Geo-Services (PGS), in 1997 GPI enters the Gulf of Mexico by acquiring 3-D data in the Western Gulf of Mexico. Between 1997 and 1999, GPI acquires over 700 OCS blocks in WGOM.

2004 - 07
 In 2004, GPI, partnering with WesternGeco, acquires over 350 OCS blocks of OBC 3-D within West Cameron & Main Pass (Central Gulf of Mexico). The 20-year partnership between GPI & WesternGeco now exceeds 50 seismic joint-venture programs.

2009
 GPI, in partnership with Geokinetics, begins acquisition of the first Pennsylvania Multiclient 3-D survey within the Marcellus Shale (358 square miles) just shy of GPI's 25th anniversary.



Downey



Thomasson



Campen



Kaldi



Party



Ziegler



Johnson



Prather



Brown



Jones



Lakin



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Mallon



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Mummery



Ritter



Shaw



West



Read



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Kontorovich



Narimanov



Hopkins



Lowell

40 will be honored in Denver

Downey Tops AAPG Awards List

By SUSIE MOORE

Communications Project Specialist

Marlan W. Downey, a celebrated leader in the profession and the industry who has influenced generations of explorationists with his precision, successful administrative skills and creative vision of possibilities, leads the list of those who will receive AAPG honors and awards in Denver.

Downey, currently founder and CEO of Roxanna Oil, is the recipient of the Sidney Powers Award, the Association's highest honor.

It's the latest in a long line of honors given to Downey, who had led two major international oil companies, served as an administrator and professor in academe and is an AAPG past president (see related story, page 12).

Downey heads the list of 40 awardees who will be honored at the opening session.

The ceremony is part of the meeting's opening session, which officially will begin at 4 p.m. Sunday, June 7, in the Colorado Convention Center's Four Seasons Ballroom.

The session will include pre-show entertainment and music that begins at 3:30 p.m., featuring the award-winning Rocky Mountain Children's Choir. The program also will feature welcoming remarks from General Chairman Randy Ray; the presidential address from Scott Tinker; and remarks from Downey.

AAPG awards, nominated by the Advisory Council and approved by the Executive Committee, are presented annually to recognize individuals for service to the profession, the science, the Association and the public. Also being recognized will be two award

winners from the House of Delegates.

Joining Downey at the top of the awardees list is **M. Ray Thomasson**, with Thomasson Partner Associates in Denver and AAPG past president, who is this year's recipient of the Michel T. Halbouty Outstanding Leadership Award – AAPG's second highest honor (related story, page 24).

Full biographies and citations of all award winners will be included in a future BULLETIN.

Those award winners who will be honored along with Downey and Thomasson in Denver are:

Honorary Member Award

Presented to members who have distinguished themselves by their accomplishments and through their service to the profession of petroleum geology and to AAPG.

□ **Elizabeth B. Campen**, Campen Consultants, Billings, Mont.

□ **John G. Kaldi**, Australian School of Petroleum, Adelaide, Australia.

□ **J. Michael Party**, Wagner & Brown, Midland, Texas.

□ **Peter A. Ziegler**, Petroleum Exploration Consulting Services, Binningen, Switzerland.

Outstanding Explorer Award

Presented to members in recognition of distinguished and outstanding achievement in exploration for petroleum or mineral resources, with an intended emphasis on recent discovery.

□ **Michael S. Johnson**, consultant, Denver, honored for his achievement in originating the concept that led to the Parshall Field discovery in North Dakota

– and opening the current much publicized and highly successful Bakken Shale play. (See related story, page 28.)

Robert R. Berg Outstanding Research Award

AAPG's newest award, presented to honor a singular achievement in petroleum geoscience research.

□ **Bradford E. Prather**, Shell International, Houston, honored for his work in deepwater siliciclastic systems, furthering our understanding of slope and base of slope systems.

Distinguished Service Award

Presented to those who have distinguished themselves in singular and beneficial long-term service to AAPG.

□ **Alistair R. Brown**, consultant, Allen, Texas.

□ **Larry L. Jones**, Spartan Petroleum, Houston.

□ **Mike J. Lakin**, Envoi, London, England.

□ **Dalton F. Lockman**, Plains Exploration & Production, Bakersfield, Calif.

□ **Kenneth M. Mallon**, consultant, Houston.

□ **Randi S. Martinsen**, University of Wyoming, Laramie, Wyo.

□ **Robert C. Mummery**, Almandine Resources, Calgary, Canada.

□ **John E. Ritter**, Occidental Petroleum, Houston.

□ **Stephen L. Shaw**, Firstview Resources, Midland, Texas.

□ **Jack H. West**, consultant, Bakersfield, Calif.

Grover E. Murray

Distinguished Educator Award

Presented for distinguished and outstanding contributions to geological education, both at the university level and toward education of the general public.

□ **J. Frederick Read**, Virginia Polytechnic Institute, Blacksburg, Va. (See related story, page 60.)

□ **Finn Surlyk**, University of Copenhagen, Copenhagen, Denmark.

Special Award

Presented to individuals and organizations whose area of work may not qualify for one of the existing awards, but is worthy of Association recognition.

□ **Alexei E. Kontorovich**, Institute of Petroleum Geology and Geophysics, Novosibirsk, Russia. One of the most influential, honored and recognized geologists living in Russia, Kontorovich has had a profound impact on the mapping and assessment of oil and gas reserves in most Russian basins.

□ **Akif Ali Narimanov**, Baku, Azerbaijan.

Public Service Award

Presented to recognize contributions of AAPG members to public affairs – and intended to encourage such activities.

□ **Owen R. Hopkins**, Suemar Exploration, Corpus Christi, Texas, for promoting geosciences in the public and at schools, including his efforts to have a U.S. Geological Survey Time and Terrain Map of the United States mounted prominently in south Texas schools.

See **Awards**, page 20

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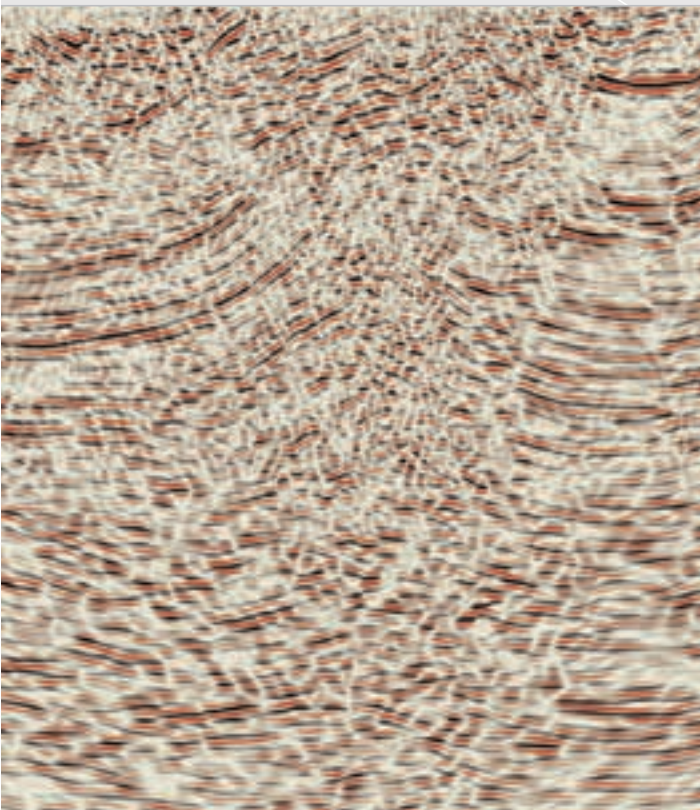


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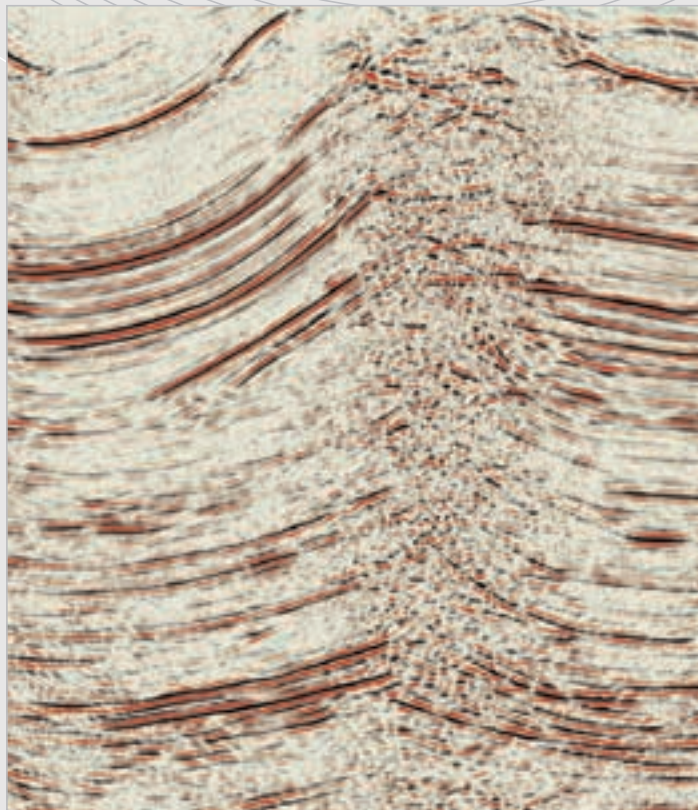


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Awards

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Pioneer Award

Presented to long-standing members who have contributed to the Association and who have made meaningful contributions to the science of geology.

☐ **James D. Lowell**, consultant, Denver. A 52-year member of AAPG, Lowell has specialized as an expert in structural geology on domestic and international projects that include the North Sea, South America, Southeast Asia, Trinidad, Somalia, the Middle East, Europe and Alaska.

Wallace E. Pratt Memorial Award

Presented to honor and reward the author(s) of the best AAPG BULLETIN article published each calendar year.

☐ **Joe Cartwright, Mads Huuse and Andrew Aplin**, for "Seal Bypass Systems," which appeared in the August 2007 BULLETIN. Cartwright and Huuse are with 3DLab, School of Earth, Ocean and Planetary Sciences, Cardiff University, Cardiff, United Kingdom, and Aplin is with NRG, School of Civil Engineering and Geosciences, University of Newcastle, Newcastle-Upon-Tyne, United Kingdom.

Robert H. Dott Sr. Memorial Award

Presented to honor and reward the author/editor of the best special publication dealing with geology published by the Association.

☐ **Tor H. Nilsen, Roger D. Shew, Gary S. Steffens and Joseph R.J. Studlick**, for Studies 56, Atlas of Deepwater Outcrops. The late Tor Nilsen was a consultant, former U.S. Geological Survey geologist and a legendary instructor for AAPG; Shew is with the University of North Carolina at Wilmington and consulting geologist, Wilmington, N.C.; Steffens is with Shell International E&P Inc., Houston; and Studlick is with Maersk Oil America Inc., Houston.

J.C. "Cam" Sproule Memorial Award

Presented to recognize and reward younger authors of papers applicable to petroleum geology.

☐ **David R. Pyles**, for the paper "Multiscale Stratigraphic Analysis of a Structurally Confined Submarine Fan: Carboniferous Ross Sandstone, Ireland." Pyles is with the Chevron Center of

See Honors, page 22



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Honors

from page 20

Research Excellence, Department of Geology and Geological Engineering, Colorado School of Mines, Golden, Colo.

George C. Matson Award

Presented to honor and reward the best oral presentation at the AAPG Annual Convention and Exhibition in San Antonio.

□ **Mark Knackstedt**, for the paper "Carbonate Petrophysical Parameters Derived from 3-D Images." Knackstedt is with the Australian National University, Canberra, Australia.

Knackstedt's co-authors are **Mahyar Madadi**, **Christoph Arns**, **Gregor Baechle**, **Gregor Eberli** and **Ralf Weger**.

Jules Braunstein Memorial Award

Presented to honor and reward the best poster presentation at the 2008 AAPG Annual Convention and Exhibition in San Antonio.

□ **Tim Dooley**, **Michael Hudec** and **Martin Jackson**, for the poster "Dismembered Sutures Formed During Asymmetric Salt-Sheet Collision." All are with Jackson School of Geosciences at the University of Texas at Austin.

Gabriel Dengo Memorial Award

Presented to honor and reward the best international paper at the 2008 AAPG International Convention and Exhibition in Cape Town, South Africa.

□ **Charles Kerans**, for the paper "Carbonate Grainstone Geobody Occurrence and Organizations." Kerans is with the Department of Geosciences, University of Texas at Austin.

Delegates to Study AAPG Structure

By **GEORGE BOLE**
Chair, House of Delegates

A very important topic will be opened for discussion at the AAPG House of Delegates (HoD) meeting in Denver on Sunday, June 7.

The Executive Committee is seeking feedback, questions and comments relative to a Global Corporate Structure (GCS) for AAPG, asking the Delegates to provide a "sense of the House" for a GCS to be implemented over the next two years.

Materials have been made available to Delegates to review via the Delegates Voice and the Web site. Delegates should review these materials prior to the HoD meeting – and contact us immediately if you have questions.

A GCS was anticipated by the Association's Strategic Plan, and the concept has been under development for the past several years. It basically involves needing to incorporate the Association in a way that will protect our assets as we continue to provide services to our members in the



Bole

Committee" of four and is in a format to be presented to the HoD.

A special note to Delegates: Please review the information on the proposed Global Corporate Structure prior to our meeting in Denver – and come prepared to move AAPG forward as a global organization by providing your input to the "special committee's" report.

If you cannot make the Denver meeting, please try to find an alternate to attend in your place.

– **GEORGE BOLE**

international and domestic arena.

For this, some restructuring likely will be needed.

There will be no loss in benefits and services to the membership under a GCS. A report has been prepared by a

This committee report and other background information was distributed to the Delegates in early May for review and consideration. It included among other things:

✓ An executive summary that shows reasons why a GCS is needed, how it can further the goals of AAPG and the advantages that a GCS affords the Association members.

✓ A flowchart to be used to effect the change.

✓ A proposed structure for a GCS, accompanied by legal opinions from our council backed by legal opinions from attorneys who specialize in setting up GCSs.

✓ An analysis and assessment of the strengths and weaknesses of similar global models, and the pros and cons of applying these models to AAPG.

✓ A "ballpark" estimate of the cost of implementation.

✓ Frequently Asked Questions on the Web site, where members can provide feedback and input to the plan. □

Ziad Beydoun Memorial Award

Presented to honor and reward the best international poster presentation at the 2008 AAPG International Convention and Exhibition in Cape Town, South Africa.

□ **George Pemberton** for the poster "The Role of Bioturbation in Low Permeability Gas-Charged Reservoirs." His co-authors are **Murray Gingras** and **James MacEachern**.

Pemberton and Gingras are with the University of Alberta's department of earth and atmospheric sciences, Edmonton,

Canada, and MacEachern is with the earth sciences department at Simon Fraser University, Burnaby, Canada.

Pemberton was a 2008 AAPG Grover E. Murray Memorial Distinguished Educator award winner.

House of Delegates Honorary Member Award

Presented "in recognition of a record of consistent, dedicated, and exemplary service to the HoD through committee work and officer service."

□ **Terry L. Hollrah**, Hollrah Exploration Co., Oklahoma City.

House of Delegates Distinguished Member Award

Presented to those who have distinguished themselves in singular and beneficial long-term service to the House of Delegates.

□ **Susan M. Landon**, independent, Golden, Colo.

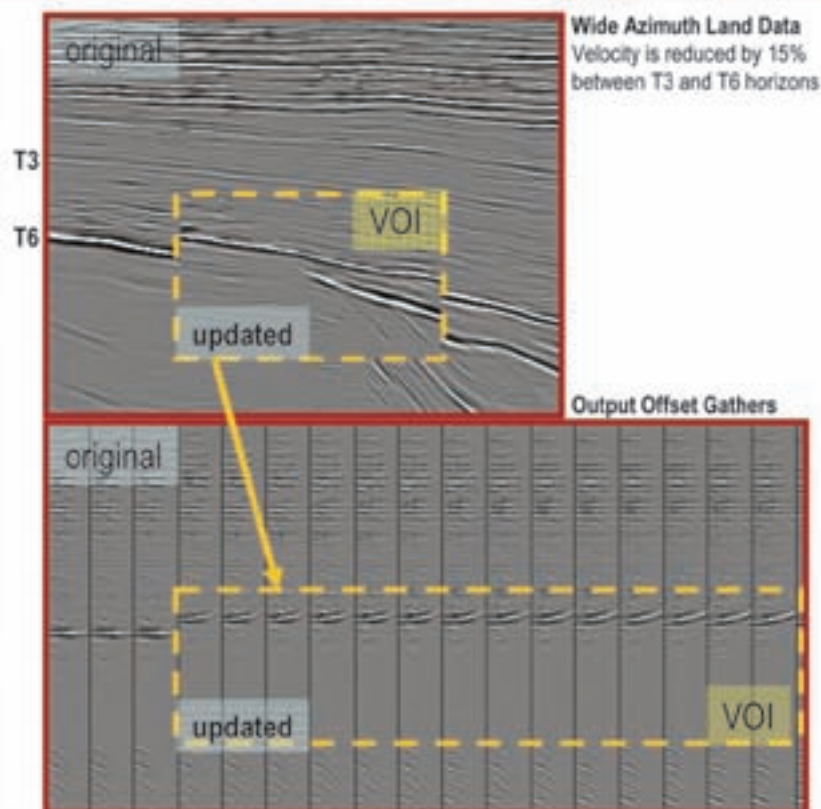
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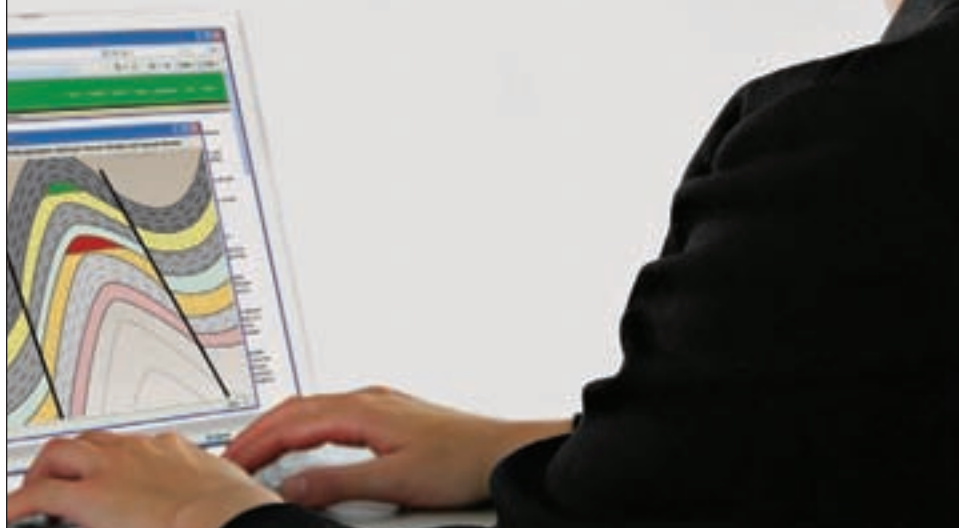
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Thomasson: Still Thinking Independently

*Leadership awardee
a self-proclaimed contrarian*

By LOUISE S. DURHAM
EXPLORER Correspondent

If you notice someone whizzing by in a near-blur at AAPG's annual convention in Denver, it may well be geologist and AAPG member Ray Thomasson.



Thomasson

The noted explorationist is going to be a mighty busy fellow at this year's confab.

For starters, he's tapped to receive the Michel T. Halbouty Outstanding Leadership Award. That alone is enough to give him a VHP – Very High Profile – in Denver.

But that's just part of the story. He'll also speak at the Monday afternoon Discovery Thinking Forum as well as co-chair the Tuesday morning session on Global Climate Change.

He'll also be wearing the hats – ribbons, actually – of past AAPG president, past Advisory Board chair and Honorary Member.

Sounds like a conventional Association man, right?

You may be surprised, then, to see that Thomasson, who is president and owner of Denver-based Thomasson Partner Associates, has tagged his Forum presentation "Challenge Dogma – Question the Answer."

It's a fitting title in that it has been the mantra of this self-proclaimed contrarian throughout his career.

Preparation

Thomasson joined Shell Oil Co. fresh out of college. He spent a number of years with the company honing his exploration skills and philosophy.

Following a stint as manager of planning economics and forecasting in the United States, Shell moved him to London to take charge of strategic studies, which entailed formulating recommendations for how much each organization within the company should spend based on scenario planning.

"What I learned is no one can predict the future," he said, "and it's really important to

plan within a range of futures.

"For instance, when you hear all say the price of oil and gas has to go up in some rather non-typical fashion, be careful – because they're almost always wrong," Thomasson noted.

"When all are going in one direction be very careful," he said, "and be sure to be prepared for everything going in the other direction."

The wisdom of such thinking hits home when he cites the example of not having all your money in the stock market in late 2007.

Principle

Thomasson noted it's a principle to challenge dogma, but the other part of that is to question the answers because when something is analyzed there frequently will be a series of answers that can be very wrong as well.

"It's a philosophy," he said, "and where I applied it in a particularly important way was in 1986 when the oil and gas world was in shambles because of prices.

"Everybody in the Rocky Mountains was in a catastrophic state, and all the majors and many of the independents left Denver for Houston," Thomasson said. "That's when I moved from Houston to Denver, and it's worked exceedingly well.

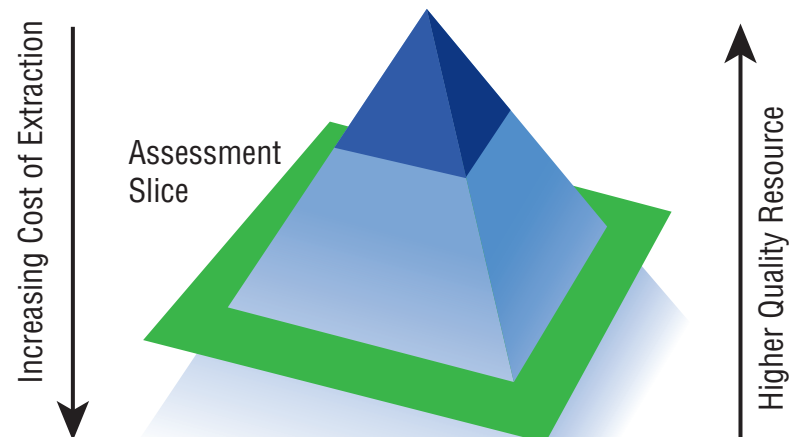
"The majors had looked at opportunities in the Rockies incorrectly," he asserted, "because they didn't understand the character of the potential.

"The resource pyramid (see below) had been introduced in 1976," Thomasson noted. "I realized how important that was, and the Rockies have a series of reservoirs that were further down on the resource pyramid.

"As technology improved and/or if prices went up, we could expose ourselves to giant accumulations – and that's what happened," he said. "In the last 15 years, there have been 10 or more giant fields of more than one Tcfg or 100 MMbo found in the Rockies, such as Jonah and Pinedale.

"That kind of potential was what I could dream of," Thomasson added. "I didn't know it was going to happen, but could certainly visualize that it could happen.

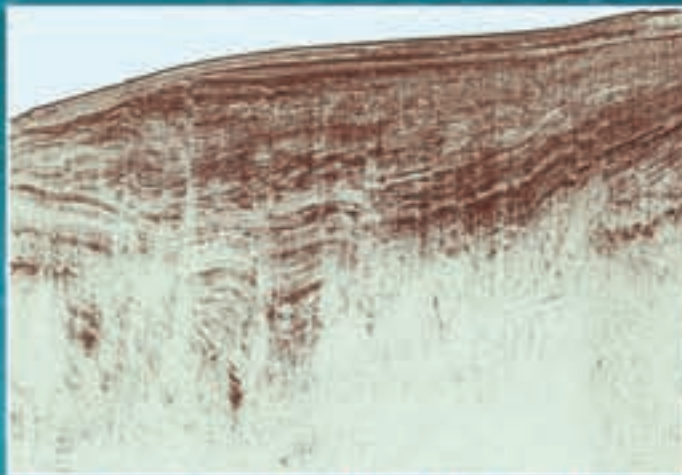
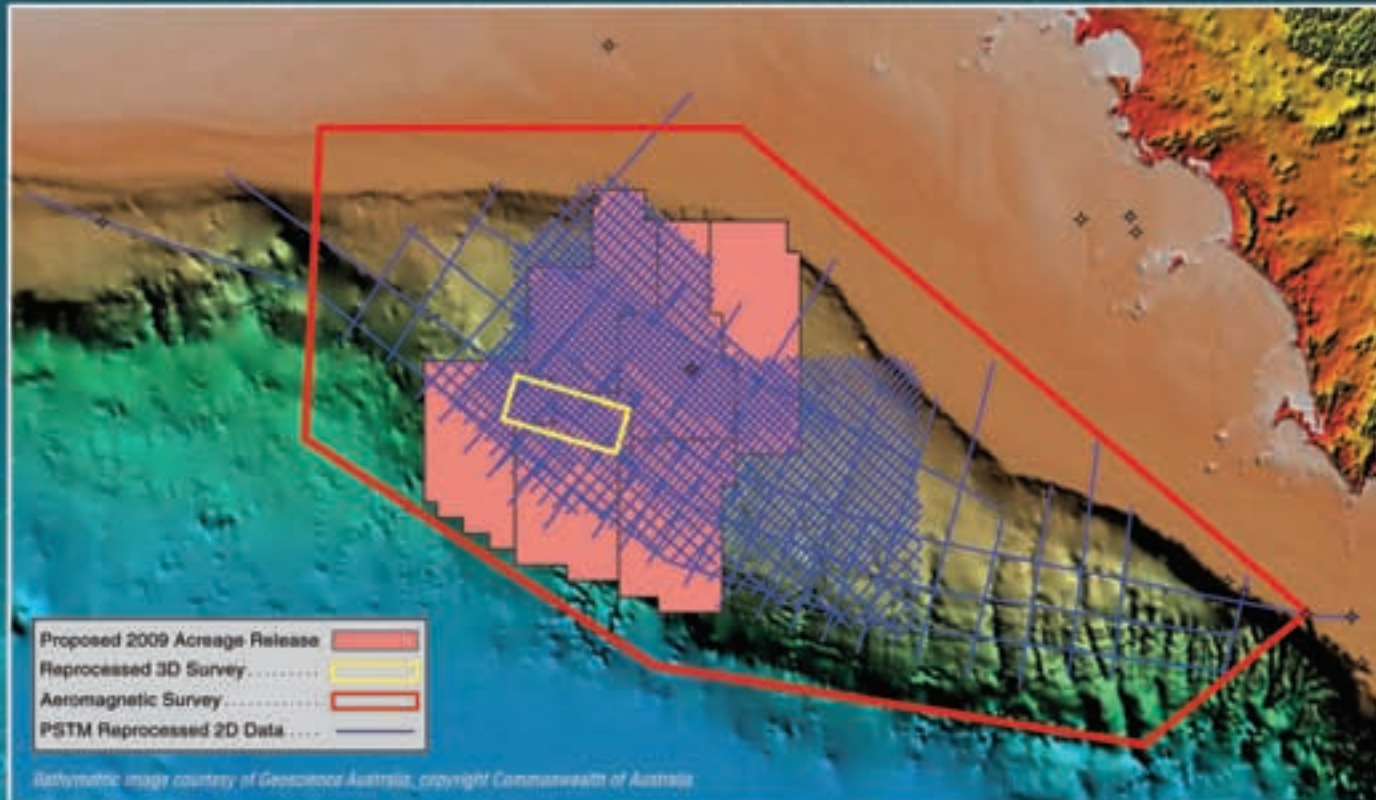
See **Thomasson**, page 30



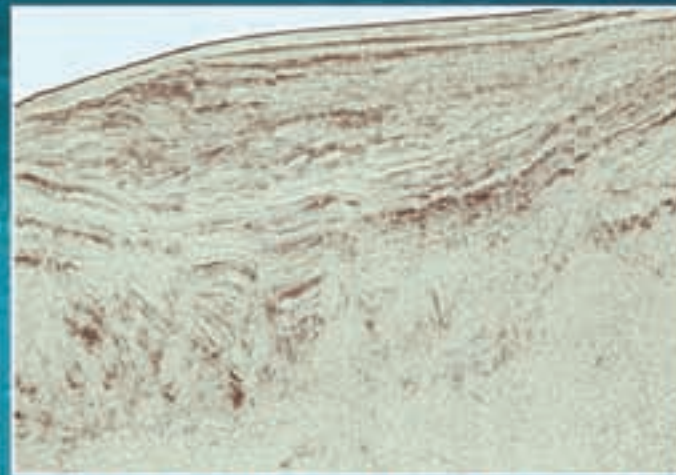
The resource pyramid, charting the economic feasibility of an area's petroleum reserves. It shows a small volume of prime resource at top and, at bottom, larger volumes of lower quality resources that are more expensive to extract. Assessments define only resources that have economic potential within the foreseeable future (USGS).

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Forums Explore 'Discovery Thinking'

By LOUISE S. DURHAM
EXPLORER Correspondent

There's considerable angst permeating the industry over the disappearing knowledge base triggered by the ongoing departure of many veteran explorationists and others who are joining the ranks of retirees.

Many of these folks not only have achieved legendary status, they also represent a now-disappearing breed of oil finder – one who possesses a near-encyclopedic knowledge of geology and often is willing to “bet the farm” when prospecting for hydrocarbons.

In fact, these veteran explorers appear to have an innate knack for discovering oil and gas accumulations. Interest in devising ways to capture

some of the wealth of knowledge they have acquired is escalating, and AAPG is very much at the forefront in the effort to make this happen.

A notable example is the annual “Discovery Thinking Forum,” which premiered at the 2008 annual convention in San Antonio.

This year's Discovery Thinking Forum, the second presentation of the AAPG 100th Anniversary Committee's program “100 Who Made a Difference,” will feature seven speakers who are renowned for their success in exploring and finding hydrocarbon reserves. They are:

- ✓ Bill Barrett.
- ✓ Richard Findley.

With the 100th anniversary of AAPG coming up in 2017, the AAPG Anniversary Committee members decided a few years back that the forum would play off the century mark with the goal to ultimately feature 100 speakers who have made a significant difference in the industry.

- ✓ Steve Kneller.
- ✓ Doug Strickland.
- ✓ M. Ray Thomasson.
- ✓ Bob Weimer.
- ✓ Marv Brittenham.

Each speaker will discuss how they overcame huge challenges to succeed in both business and geological aspects of the profession.

“One hundred is a nice round number, but the symbolism is that these speakers are not just the only 100,” said Charles Sternbach, Anniversary Committee member who co-chaired last year's Forum and will reprise the role at the Denver meeting.

“They're representative of thousands or tens of thousands of remarkable people,” he said, “so we could probably go well beyond 2017.”

Sternbach long has been a champion of this legion of explorers and was instrumental in organizing the HGS Legends in Industry series that debuted about 10 years ago.

“Last year at AAPG we had some great personal stories about how people organized teams, how they managed to succeed year after year,” he said. “We wanted to make the wisdom of these wonderful people available online, so last year's presentations are on AAPG's Search and Discovery, which is a perfect medium.”

There's an emphasis on making the speakers geographically relevant to the convention locale.

“We had great Gulf Coast people last year,” Sternbach said. “This year the geography is attuned to the Rockies and some of the great legends there.”

And so ...

“There will be a much stronger focus on unconventional plays as well as the conventional,” Sternbach noted. “These people will really focus on some of the big thinking involved in some of the really big plays – and we're allowing time for good audience/speaker interaction.”

So Many Stories ...

Something profound occurred between the initial event and this year's effort: Far more speakers have volunteered to talk than the invited-speaker Forum can accommodate.

“People submitted papers, wanting to volunteer their own stories – and there are hundreds or more who could qualify,” Sternbach said. “There were so many good stories, we couldn't nail it down to just the Forum, so we formed a separate spinoff session on Monday morning for Discovery Thinking presentations (see accompanying box).”

To underscore the story emphasis, Sternbach noted the speakers don't even need to bother with technical slides unless they wish.

“No slides are needed if you don't want to,” he said. “Just tell us the story.”

According to Sternbach the Forum title “Discovery Thinking” should be credited to AAPG legend A.I. Leverson. He noted Leverson penned an inspirational paper in 1943 dealing with systematically thinking about how to think through the business of creativity in exploration.

Besides the annual Forum, another noteworthy effort to capture knowledge from the experts has been undertaken by AAPG members Paul Weimer and Ed Dolly, who are interviewing veteran explorers in the Rocky Mountain region for the most part.

Sternbach noted the interview-style effort will broaden to include other AAPG Sections, and ultimately have a global reach.

“We're capturing verbal histories and video, so current and future explorers will be able to study the lessons these great people have to offer us,” he said.

“We may ultimately have a way to digitally deliver the video message, so the value of the stories can endure,” he added. “That's the vision.” □



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Explorer of the Year saw Elm Coulee similarities

Experience Paid Off at Parshall

By LOUISE S. DURHAM
EXPLORER Correspondent

It's a given that geologist and AAPG member Michael Johnson has had a highly exciting, successful career in the oil and gas industry.

This is due for the most part to his finely honed geological expertise in combo with the tenacity to follow through on his convictions.

It's a combination that has served him well – and has resulted with him being named this year's AAPG Explorer of the Year.

This intrepid oil finder's career kicked-off in 1949 when he joined Amerada Petroleum after graduating from Ohio State University, where he earned bachelor's and master's degrees in geology. Amerada assigned him to the Williston Basin office in Billings, Mont.

Johnson barely had time to get his desk organized before he was drafted into the U.S. Army where his initial assignment was to serve as an instructor in the interpretation of aerial photographs. He later did a tour of duty at the Armed Forces Special Weapons Project at the Nevada Test Site.

Upon concluding military service in 1953, Johnson returned to Amerada's Williston Basin office for a brief stint before being assigned to Tulsa headquarters. While there, he assisted in the development of the basin's Nesson Anticline fields.

The main pay zone of these fields is a low permeability reservoir known as the Rival sub-interval of the Mississippian Madison limestone. Johnson noted the



Johnson

Michael Johnson will be honored in Denver at the AAPG Annual Convention and Exhibition as the 2009 AAPG Explorer of the Year, for his "contributions to the discovery of the Parshall Field in North Dakota, along with an outstanding career that has demonstrated the value of intelligent and tenacious effort combined with exemplary character."

The award will be presented during the convention's opening session, which begins at 4 p.m. Sunday, June 7. Pre-show entertainment begins at 3:30 p.m.

This is the story behind why he'll be honored.

reservoir was unusually productive, educating him early on in the importance of fracture porosity as a major contributor to reservoir quality.

After leaving Amerada in 1958, the young geologist joined Apache Oil as Rocky Mountain exploration manager. Apache was focused on the Piceance Basin, but a lack of pipeline and low gas prices took their toll, and the company soon closed the Denver office, placing Johnson on part-time retainer.

The next phase of his career entailed a full-time retainer affiliation with Wessely Energy and Headington Oil Co. – as well as work for clients in Central America, the eastern Mediterranean and the North Sea.

Call of the (Williston) Wild

No matter where this talented explorer searched for hydrocarbons, however, the lure of the Williston Basin was omnipresent. In fact, Johnson enjoyed remuneration from 12 fields in North Dakota, alone, during the latter phase of his career.

Johnson's ultimate grand slam in the

Williston occurred at the now-significant Parshall Field in North Dakota's Mountrail County, where EOG drilled the discovery well in 2006 based on an idea that originated with Johnson.

Parshall was the defining point where all of the talented oil finder's diverse experience in the geology of the Williston Basin and in aerial photo interpretation coalesced.

The giant Elm Coulee Field, which had been discovered in the mid-1990s in Montana, played a role in the Parshall find. (AAPG member Dick Findley received the 2006 AAPG Explorer of the Year honor for the Elm Coulee discovery.)

"I came up with the idea that eastern Mountrail County would be a good place to try to find another big Bakken oil field," Johnson said. "When I started looking in that area, I found it had some resemblance to Elm Coulee."

"I had just finished doing a study of Elm Coulee, so I had a pretty good idea of what caused it to trap and what the characteristics were, what the geologic setting was," Johnson said. "So I tried to

use that as an analog in looking for another one like it.

"I saw there was a similarity in the electric logs at Elm Coulee Field with several wells in eastern Mountrail County," Johnson said. "Then I noticed also by looking at additional data there had been some wells there, which I call the Parshall area, that had free oil recoveries on drillstem tests and also some wells that had actually produced oil, but not in great amounts.

"That showed the area was mature, because there wouldn't be any oil if it wasn't," Johnson said. "The drawback was, the oil wasn't in large volumes."

Another drawback was the low vitrinite reflectance and the low Tmax, indicating immaturity. Yet this was contrary to what the free oil was showing.

Another downside to the prospect area was the earlier failure of a couple of horizontal wells due to mechanical problems. Johnson noted that's hard to explain to someone if you're trying to sell acreage.

Logs Don't Lie

Undeterred, Johnson and partner Henry Gordon, president of Strata Resources, purchased 5,500 acres around the Gulf Oil Nelson Farms well, which was a seeming look-alike to Elm Coulee Field.

The two partners sold their acreage to a couple of independents who pooled their holdings with EOG, which had some offsetting acreage.

See **Johnson**, page 30

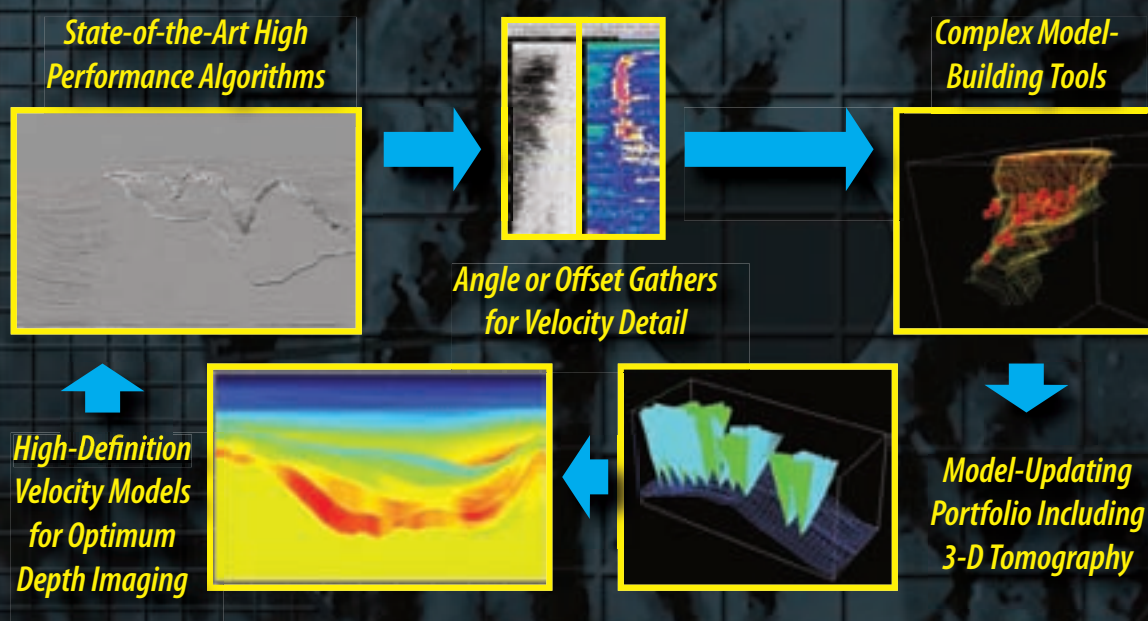
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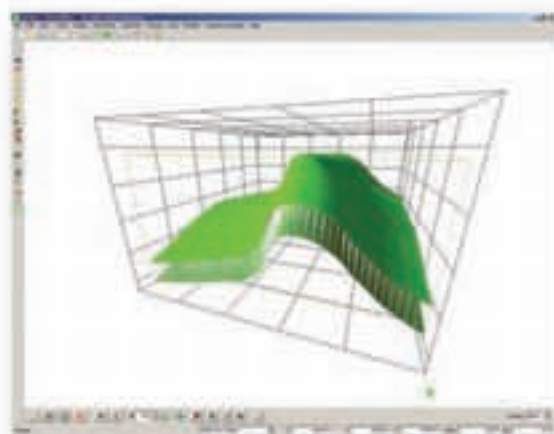
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Thomasson

from page 24

"That's an example of the contrarian in me," he noted, "and it has worked very well."

This veteran explorer is a strong believer in teamwork and the team concept, which was not even a glimmer on the exploration horizon during his early days at Shell.

He penned a paper on synergistic exploration in 1980 and noted that most companies were starting to use the team approach by the late 1980s and early 1990s.

"Many still had not been able to apply the idea of all individuals working on multiple teams," Thomasson said. "At Thomasson Partner Associates, we have taken this concept to a very high level, and the principle reason this works so well is because we apply the play concept,

which requires many different disciplines."

Thomasson's list of attributes that are must-haves for explorationists:

✓ **Curiosity:** Curious people turn over the extra stone and acquire information that enables extra insight.

✓ **Basic data:** Channel that curiosity into digging out all the basic data; don't rely on unchecked interpreted data.

✓ **Problem solving:** Understand the problem, and then the creative mind will only be satisfied after returning to the basic original data.

✓ **Vision:** Ability to see the big picture and visualize the importance of major opportunities and constraints.

✓ **Think big:** This is the emphasis at Thomasson Partner Associates.

✓ **Persistence:** This is all important, particularly in the face of adversity.

✓ **Technology and art:** Exploration incorporates science and technology, but

exploration is an art – at the end of the day you should also trust your experienced gut, which is invaluable. If there is a conflict, check out the technology once more.

✓ **Passion and enthusiasm:** Great explorationists are passionate about what they do.

✓ **Optimism:** There is no substitute for optimism.

✓ **Take risk and mitigate it:** Spread your investment over a number of projects; big successes will cover the many failures.

✓ **Challenge dogma:** Explorationists have had dogma preached to them on an ongoing basis, and it is usually wrong, e.g., after 19 dry holes, there can't be anything big in Bay Marchand.

✓ **Question the answers:** The most important question may not be "do we know for certain the play concept can work," but instead "do we know for certain the play concept can't work." □

Johnson

from page 28

In turn, EOG drilled the discovery well for the Bakken reservoir in eastern Mountrail County. The horizontal well, which was a twin to the Gulf Nelson Farms well, marked the discovery of Ross Field in late 2005 prior to Parshall.

While that action was ongoing, Johnson and Gordon decided to head south about 25 miles to another well – the Lear #1 Parshall – where the logs again looked like logs from Elm Coulee.

The goal was to try to also buy acreage in that vicinity.

"Bob Berry, a Tulsa geologist, financed the purchase of that block, buying about 38,000 acres there," Johnson said, "based on just one well in the middle of the block – I was amazed this acreage was not already leased."

Selling the purchased block was no slam-dunk, as operators were familiar with the questionable maturity of the Bakken oil in this general locale and the earlier horizontal well failures.

EOG ultimately acquired the block from Berry and drilled the #1-36H Parshall discovery well, which was a twin to the Lear well drilled in 1981. Pressures were so high in this initial well that it blew out once the lateral leg reached 1,200 feet into the middle member of the Bakken. Upon completion, the well was kicking out 463 bopd.

"Both discoveries were twins to old wells drilled 20 years ago, and that's how we relied on petrophysics to pick up the acreage," Johnson said. "EOG also felt the logs were telling us something, and that's why they twinned those wells."

The American Dream

Johnson emphasized that Parshall, which covers 225,000 acres and could extend to over 400,000 acres, has exceeded expectations.

He noted that reserve estimates, based on 500 Mbo per well – which is less than reserve figures made public by operators – are estimated at 175 MMbo for the existing field size and 350 MMbo if the field extends to 400,000 acres. In fact, ultimate attainable field size for Parshall and its extensions could bump that number up to 500 MMbo.

Parshall is of particular importance in that it is a new type of unconventional stratigraphic trap that is productive from the Middle Bakken member. The boundary between thermally mature and immature Bakken forms part of the updip trap, making it different from any Bakken field in North Dakota.

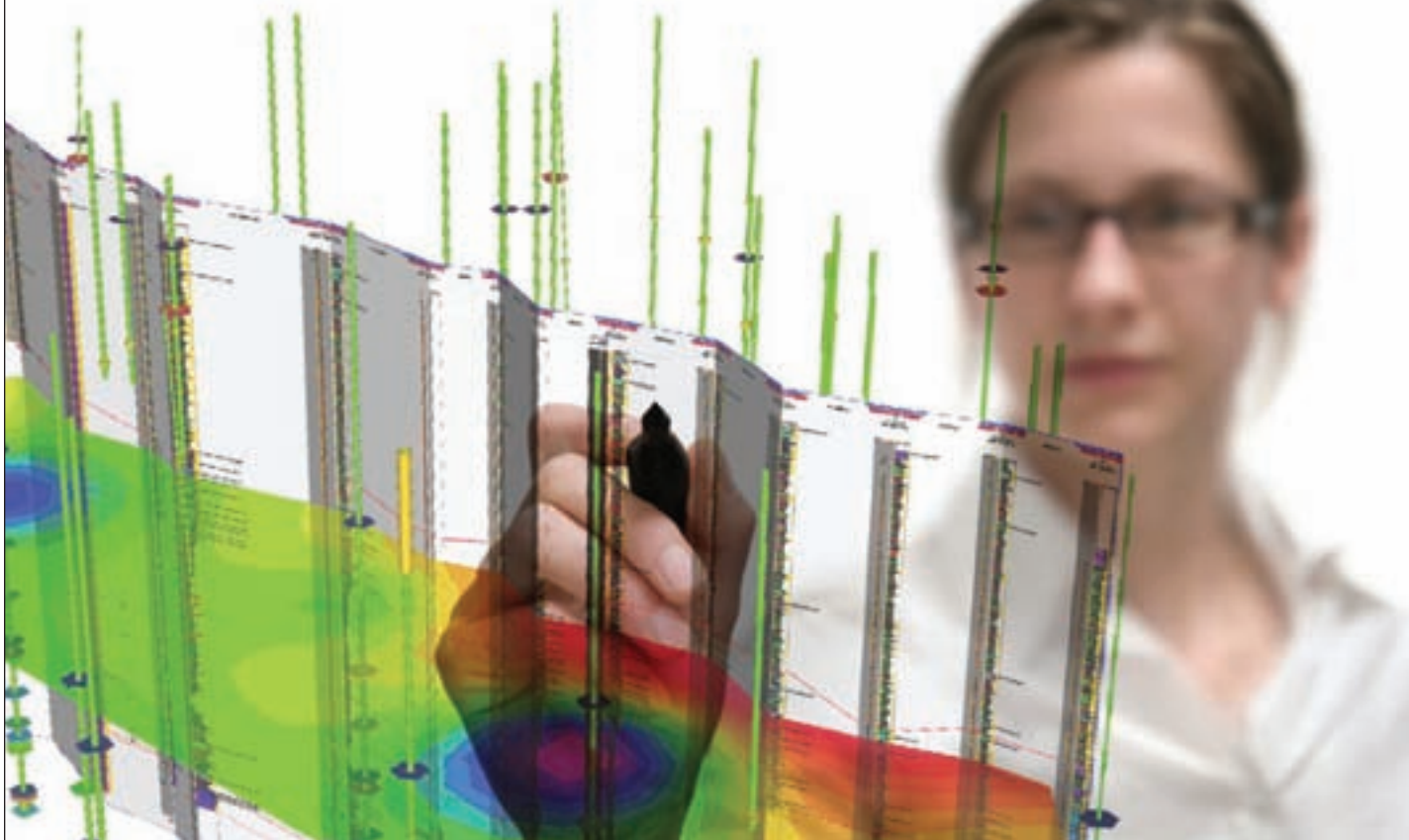
Parshall's discovery had a decided impact on the U.S. Geological Survey's recent assessment of the Bakken formation in the Williston Basin in Montana and North Dakota.

"This was a surprise discovery in Parshall in that this success was outside the Bakken oil window that was preciously understood – it was to the east of that," said AAPG member Rick Pollastro, USGS geologist and Bakken formation task leader. "It was outside the area of what was thought to be the continuous accumulation.

"We had to re-establish the area where the oil generation window for the Bakken was to do our assessment," he noted. "From the oil taken from those wells, we think it was generated in place. That's the model I developed – some agree and some have a different story."

Like most success stories in this business, getting the deal done at Parshall took not only a heap of geologic smarts but unwavering perseverance as well. □

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21st century yields big finds

Discoveries 'Changed the Game'

By LOUISE S. DURHAM
EXPLORER Correspondent

A quick look at some over-the-top field discoveries during the 21st century reveals that "show time" for the petroleum industry is far from over.

AAPG member Bob Fryklund, vice president Houston-based IHS, notes innovative play concepts and technologies have rewarded explorers with game-changing discoveries from 2000 through 2007.

The hydrocarbon finds during this period yielded 121,371 MMbo plus 751.5 Tcf of gas.

In other words, those who have decried a perceived dearth of discoveries may not have been paying enough attention.

Consider:

✓ First up at the start of the millennium was the Kashagan field with 18.1 Bboe, which was the largest field discovery since Prudhoe Bay in Alaska more than 30 years ago. Kashagan put the spotlight on the Caspian Sea region as a critical hydrocarbon resource.

✓ The second largest find came about via Petrobras with the discovery of the 6.525 Bboe sub-salt Tupi Field offshore Brazil in the Santos Basin.

Brazil's deepwater sub-salt play extends 500 miles across the Santos, Campos and Espirito Santo basins, according to Fryklund. He noted the play has tremendous upside potential with more than 15 Bboe of reserves reported thus far.



Fryklund

Those who have decried a perceived dearth of discoveries may not have been paying enough attention.

21st Century Exploration: So Far, So Good

The paper "Game-Changing Discoveries Highlight 21st Century Exploration" by Pete Stark and Bob Fryklund will be presented at 1:20 p.m. on Wednesday, June 10, at the AAPG Annual Convention and Exhibition in Denver.

The paper is the first in the technical session of the same name, chaired by Stark and Fryklund.

Other papers in the session will cover the pasts, presents and futures of:

✓ Kazakhstan's super-giant

✓ Turkmenistan's Yoloten-Osman field joined the ranks of international game changers when appraisal efforts established super giant reserves there, boosting it to the position of fifth largest gas field in the world during 2008.

Kashagan Field in the North Caspian Basin.

✓ Brazil's deepwater subsalt discoveries.

✓ The deepwater Gulf of Mexico's Lower Tertiary Trend.

✓ Ghana's deepwater Jubilee Field.

✓ The Haynesville Shale play of northwest Louisiana and eastern Texas.

✓ The Bakken Shale play in North Dakota's Sanish/Pashall Field area.

✓ The super-giant discoveries in Brazil's Santos Basin.

✓ Domestically, Chevron's Jack 2 well in the deepwater Gulf of Mexico Wilcox sub-salt play revealed the potential for three to 13 Bboe recoverable in the play. To the north on land, U.S. operators tapped into game-changing resource

plays in the Williston Basin Bakken shale oil along with the Haynesville and Fayetteville shale gas plays.

Hail to Shale

In fact, for the past couple of years, the plethora of domestic shale gas play discoveries have become gangbuster headline-grabbing events.

"One of the questions we get asked the most is what happened to gas," Fryklund said. "In North America, we went from a struggle to stay even to an oversupply.

"The big driver was the shales, the unconventional," he said. "Those were the things that weren't on anybody's radar screen."

Shale potential is not confined to the much-heralded domestic plays.

"Shale is the number one source rock in the world," Fryklund noted. "Where are these critters hiding internationally is what everyone is looking at – and also coalbed methane, which has some better potential internationally.

"Australia is one of the leaders, followed by Indonesia and then South Africa and central Europe," he said. "They all have strong coal reserves to tap into, with coalbed methane leading the way.

"Shales internationally tend to be deeper, so it may take more thinking about how to get somewhere there at least on the gas side," Fryklund said.

See **Discoveries**, page 34

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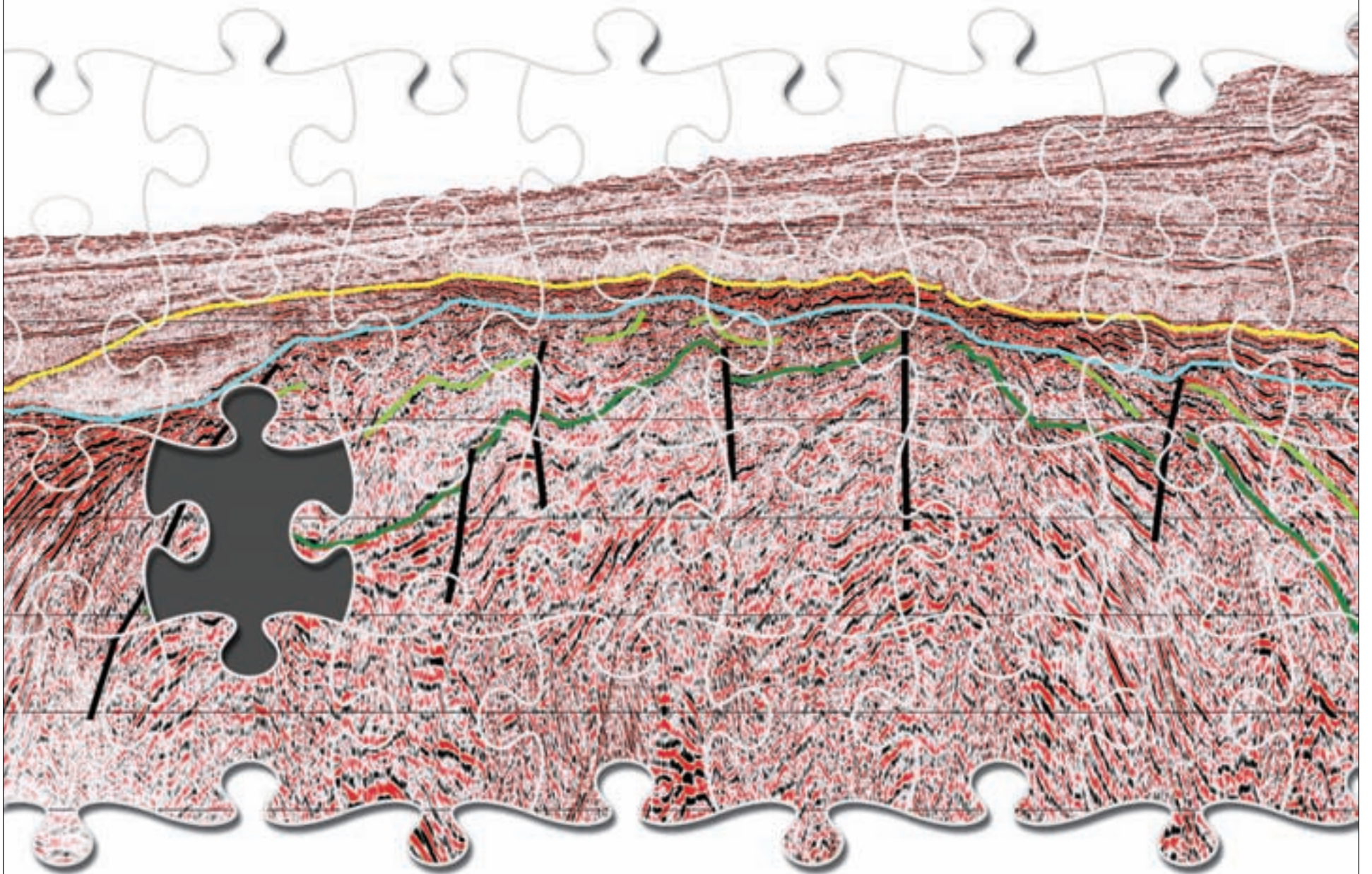
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AAPG Divisions Announce Election Results

AAPG's three Divisions have announced the results of their officer elections. The respective executive committees will be seated on July 1. The results are:

Division of Environmental Geosciences

- President-elect (president 2010-11) – **Mary K. Harris**, Savannah River National Laboratory, Aiken, S.C.
- Vice president (2009-10) – **Jeffrey G. Paine**, University of Texas at Austin, Texas.
- Secretary-Treasurer (2009-11) – **Douglas Carlson**, Louisiana Geological Survey, Denham Springs, La.

They will join a DEG Executive Committee for 2009-10 that also includes **Michael A. Jacobs**, Pioneer Natural Resources, Midland, Texas, president; **James W. Castle**, Clemson University, Clemson, S.C., editor; and **Rebecca Dodge**, Midwestern State University, Wichita Falls, Texas, past-president.

Division of Professional Affairs

- President-elect (president 2010-11) – **Daniel J. Tearpock**, Subsurface Consultants & Associates, Houston.
- Vice president (2009-10) – **Michael R. Canich Jr.**, Equitable Production, Pittsburgh.

□ Secretary (2009-11) – **Paul H. Pause**, consultant, Midland, Texas.

They will join a DPA Executive Committee for 2009-10 that also includes **Paul W. Britt**, Texlore Inc., Houston, president; **Micheal A. Fogarty**, consultant, Canaan, N.H., treasurer; and **Rick L. Ericksen**, State Board of Registered Professional Geologists, Jackson, Miss., past-president.

Energy Minerals Division

- President-elect (president 2010-11) – **Michael D. Campbell**, M.D. Campbell and Associates, Houston.
- Vice president (2009-10) – **Fran Hein**, Alberta Energy Resource

Conservation Board, Calgary, Canada.

□ Treasurer (2009-11) – **Kent Bowker**, Bowker Petroleum, The Woodlands, Texas.

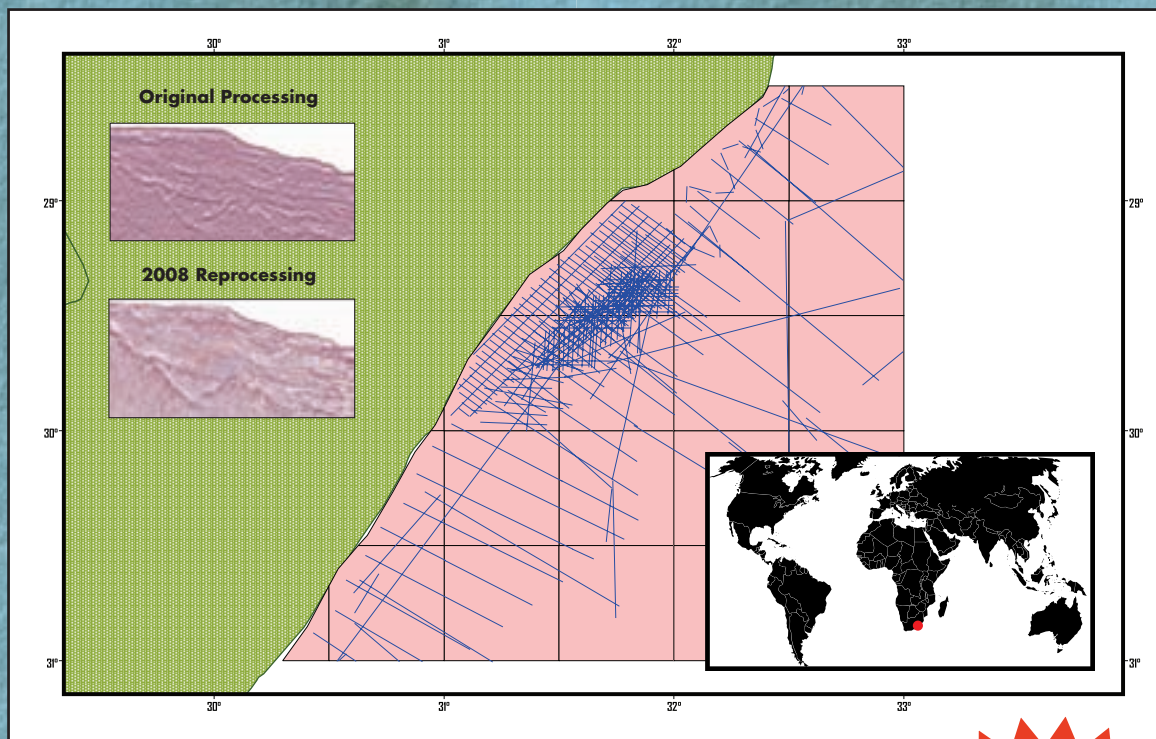
Newly elected EMD Councilors (2009-11 term) are:

□ Gulf Coast – **Michael A. Wiley**, The Consulting Operation, Canyon Lake, Texas.

□ Southwest – **J. Michael Party**, Wagner & Brown, Midland, Texas.

They will join an EMD Executive Committee for 2009-10 that also includes **Frank E. Walles**, Devon Energy, The Woodlands, Texas, president; and **Amy E. Sullivan**, Shell, Houston, secretary.

SOUTH AFRICA 2008 SEISMIC DATA REPROCESSING Tugela blocks close 30 September 2009 Natal Basin



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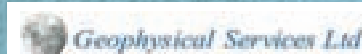


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Discoveries

from page 32

"They're not quite the lower-hanging fruit that coalbed methane is."

Looking Ahead

As the industry folks explore for the next game-changing discoveries, both the Arctic and the offshore Mediterranean deserve a close look, according to Fryklund.

He noted the Mediterranean, which has been opened up somewhat via Noble's discovery wells in the deepwater offshore Israel, could be a giant new province.

If Iraq puts out a big welcome mat for interested companies, the potential for additional major discoveries is huge. From an exploration standpoint, there will be more giants there, Fryklund said, noting that big tender offers currently are in the works.

The search for new super-size hydrocarbon deposits may be a global effort with plenty of room to roam, but don't count North America out.

"In North America, the money is going into the commodity with the nearer term better price outlook, which is oil," Fryklund said. "So the companies are changing their portfolio mix to focus more on oil."

"The deepwater is at the top of the list for the big guys and the medium size folks," he said, "and the costs are coming down for the deepwater."

Even though the big attention-grabbing story onshore North America has been about gas, this effort is struggling at the moment with low prices and an overabundance of product.

"If you look internationally, things tend not to slow as much because it's a different business," Fryklund said. "Instead of rigs being down 50 percent like in North America, they're down more in the 10 percent range."

Meanwhile, there's excitement about discoveries made in 2008.

"If the Brazil subsalt and a few more of the other new discoveries prove up to be the size of the numbers we have now," Fryklund said, "it would signal for the first time since Kashagan another little uptick in overall giants in discoveries."

"The big question is that much of the money that gets killed when we have a market downturn is the exploration money," he noted.

"I don't think we'll run out of places to look, but we may be taking a pause in our activity." □



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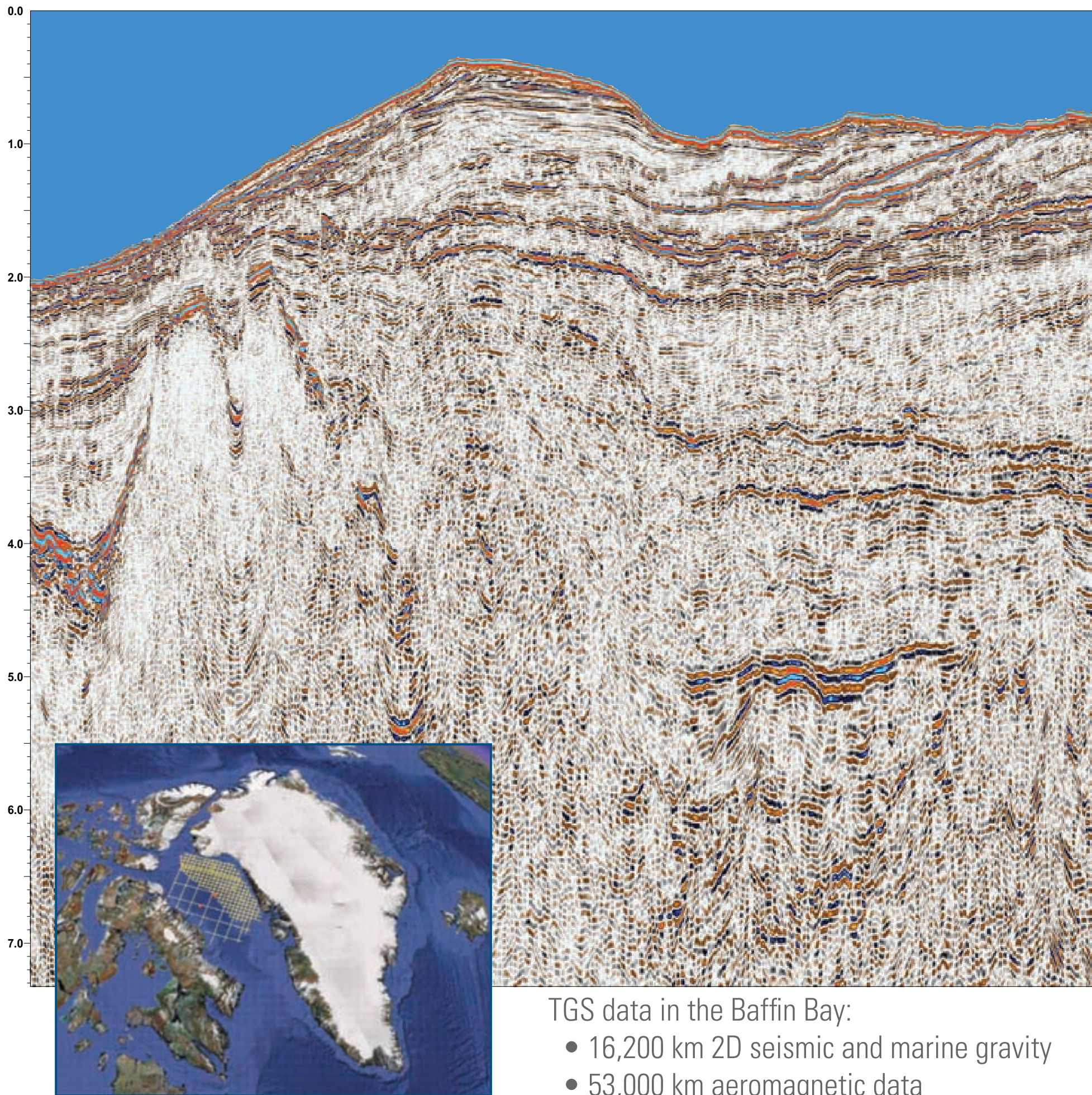
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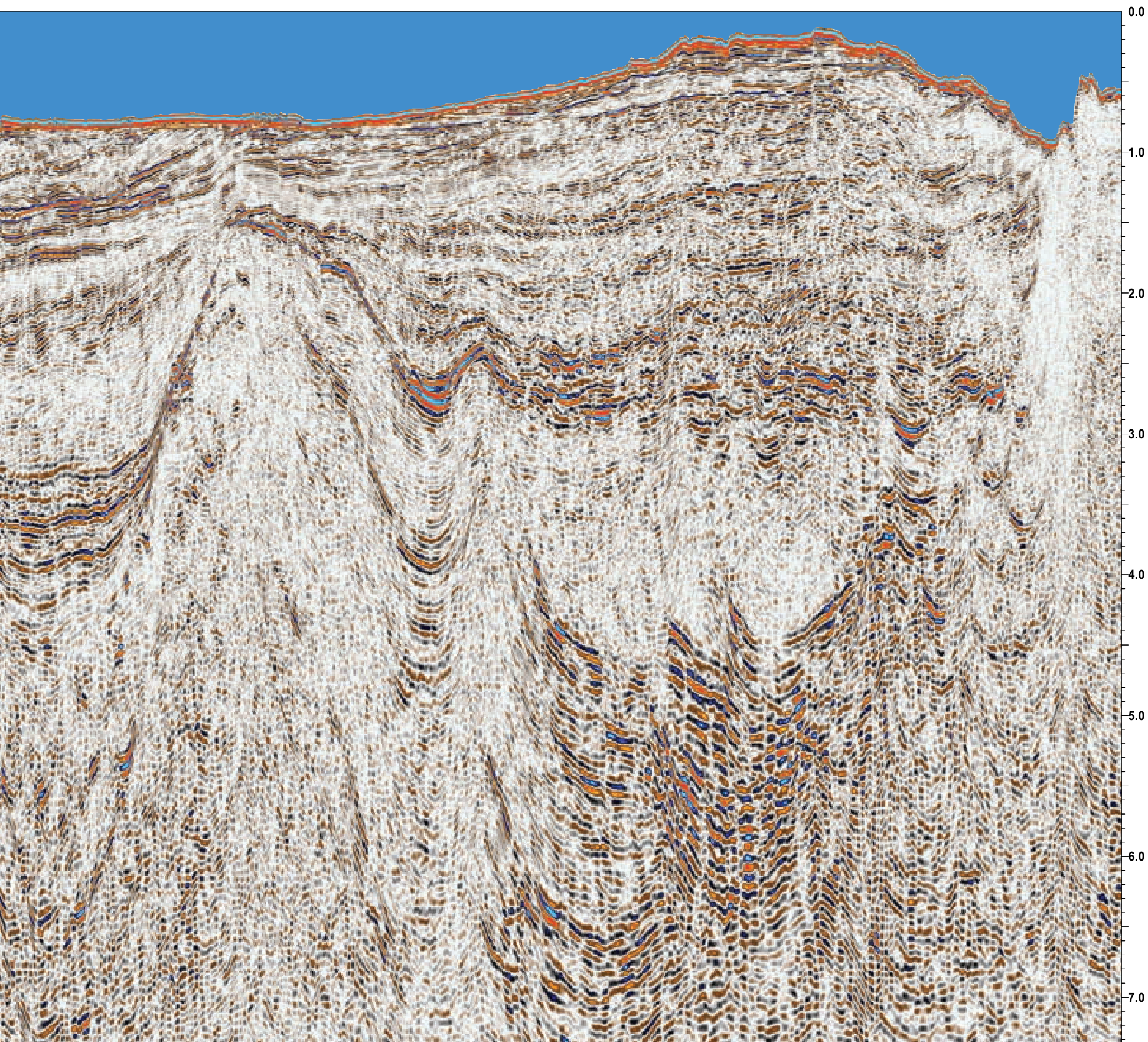


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Clean energy, renewables 'closer than you think'

'Externalities' to Affect Energy Future

By BARRY FRIEDMAN
EXPLORER Correspondent

To Dag Nummedal, clean fossil technology is not just about energy. It's about economics.

"Imagine a world," he says, "where we essentially 'manufacture' energy rather than harvest it, and an economy built around intellectual and industrial creativity.

"The change to clean, renewable energy will create the biggest global economic boom we have ever seen."

So ... do we have what it takes? Is society malleable enough to handle the changes, costs, sacrifices needed to harness this economic and geologic juggernaut?

Here Nummedal, an AAPG member and Braunstein Award winner, thinks it's the wrong question.

"It is not a matter of sacrifices – quite the contrary," he said. "Since when has development of new technology been associated with sacrifices?"

"The original industrial revolution, when we started using coal to build our manufacturing industry 250 years ago, led to massive economic progress," he continued. "The shift from the use of coal to oil by the British fleet in World War I (and the rest of the world shortly thereafter) created another major boost to the economy.

"Why will the shift to renewable energy be any different?"

A Change is Gonna Come?

That's a question that will fuel Nummedal at the upcoming AAPG



Nummedal

Dag Nummedal will present his paper "Clean Fossil and Renewable Energy – The Future is Closer Than You Think" at 1:20 p.m. Tuesday, June 9, at the AAPG Annual Convention and Exhibition in Denver.

Nummedal's talk is part of the EMD session on Geothermal Energy Systems – Their Structure, Stratigraphy and Rock Mechanics.

His co-author is David Hiller.

Annual Convention and Exhibition in Denver when he presents the paper "Clean Fossil and Renewable Energy – The Future is Closer Than You Think."

He says the opportunities and obstacles regarding energy and the future are as exciting as they've ever been.

"Technology is changing incredibly fast," he said.

As an example he talks about the solar PV industry.

"The new technologies, for example, of thin films and organic materials are making totally new forms of photovoltaic installations possible," he said.

"It is not just about silicon cells any more."

As for geothermal energy, he says the landscape is even more exciting.

"We see for the first time a push to develop deep geothermal heat in oil and gas wells in the form of enhanced geothermal systems," he said, "and not just the utilization of traditional

forms such as hydrothermal springs or shallow subsurface geothermal heat pumps."

Nummedal believes if scientists can get enhanced geothermal systems to work economically, they

will gain access to the largest energy resource on earth.

How big is this?

Nummedal says the global geothermal heat resource far exceeds the global resource in coal (let alone oil and gas).

So how close are we to this?

Nummedal, who is director of the Colorado Energy Research Institute, won't or can't say.

"I will not put a very precise number on this," he said. And to be fair, nobody else is, either.

"It is important to know, however, that most of those states that have imposed renewable portfolio standards (typically 20 percent renewables by 2020 or thereabouts) are now well along the track to beat those targets," he said.

"Once we as a nation put a price on carbon emissions," he said, "and the market forces start factoring those costs in their allocation of resources, the growth of investments in renewable energy will accelerate very fast."

'Externalities'

There are obstacles, he admits – but there always are.

"Everything we do in society is subsidized in one form or another – either directly or with indirect government assistance and private/public partnerships," he said. "Changing politics shifts the balance of these subsidies."

There is a great variable though, one we have always dealt with.

"There is also the matter of the 'externalities,' as economists call them, which are the communal costs of different forms of energy use that are not charged directly to the individual providers or consumers of energy."

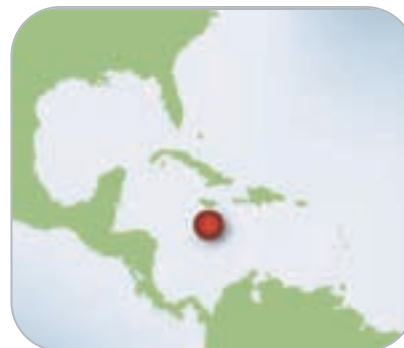
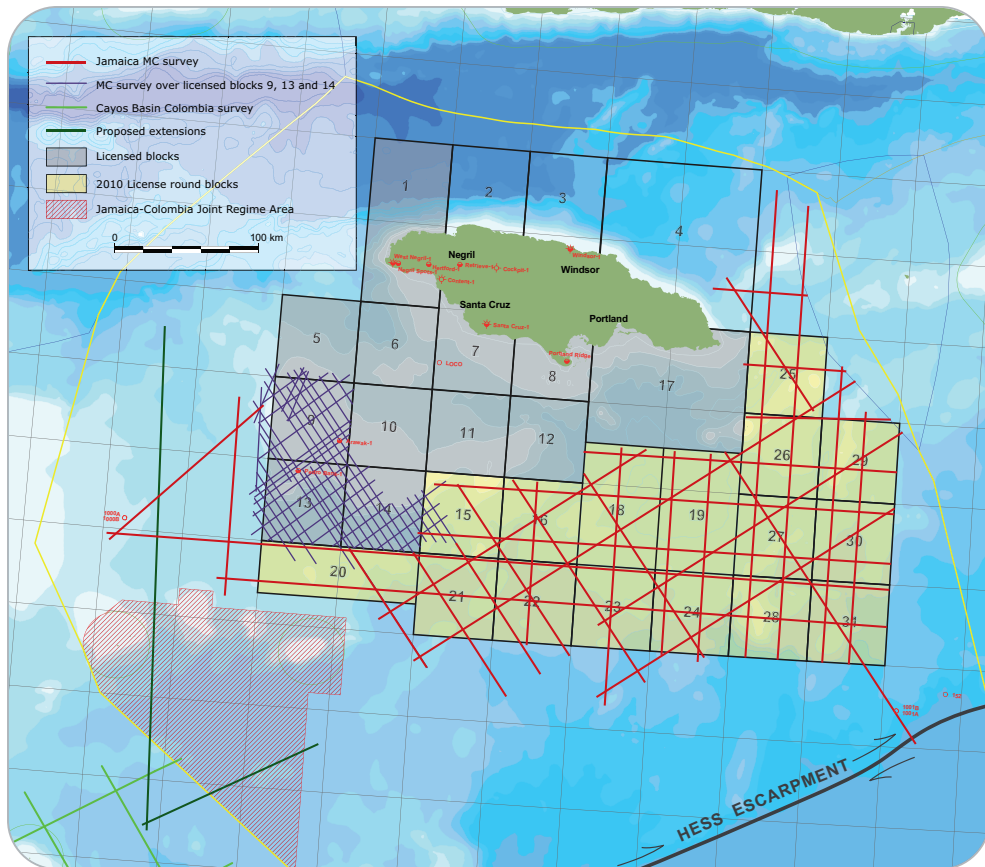
When it comes to energy derived from geothermal, the equations are still being formulated.

"We don't quite know yet exactly what all the externalities of geothermal heat development will cost, but there is every reason to think that they will be *much* lower than the externalities associated with the burning of coal – which of course is the biggest competitor for geothermal energy."

Nummedal says the energy producers with the greatest capacity to innovate (by their own R&D or acquisition) will be in the best position to move forward.

"Then again, that is the way it has always been, isn't it?" he said. "Energy producers will always remain the winners."

"We are not going to run an advanced industrial society on wood chips and cattle dung." □



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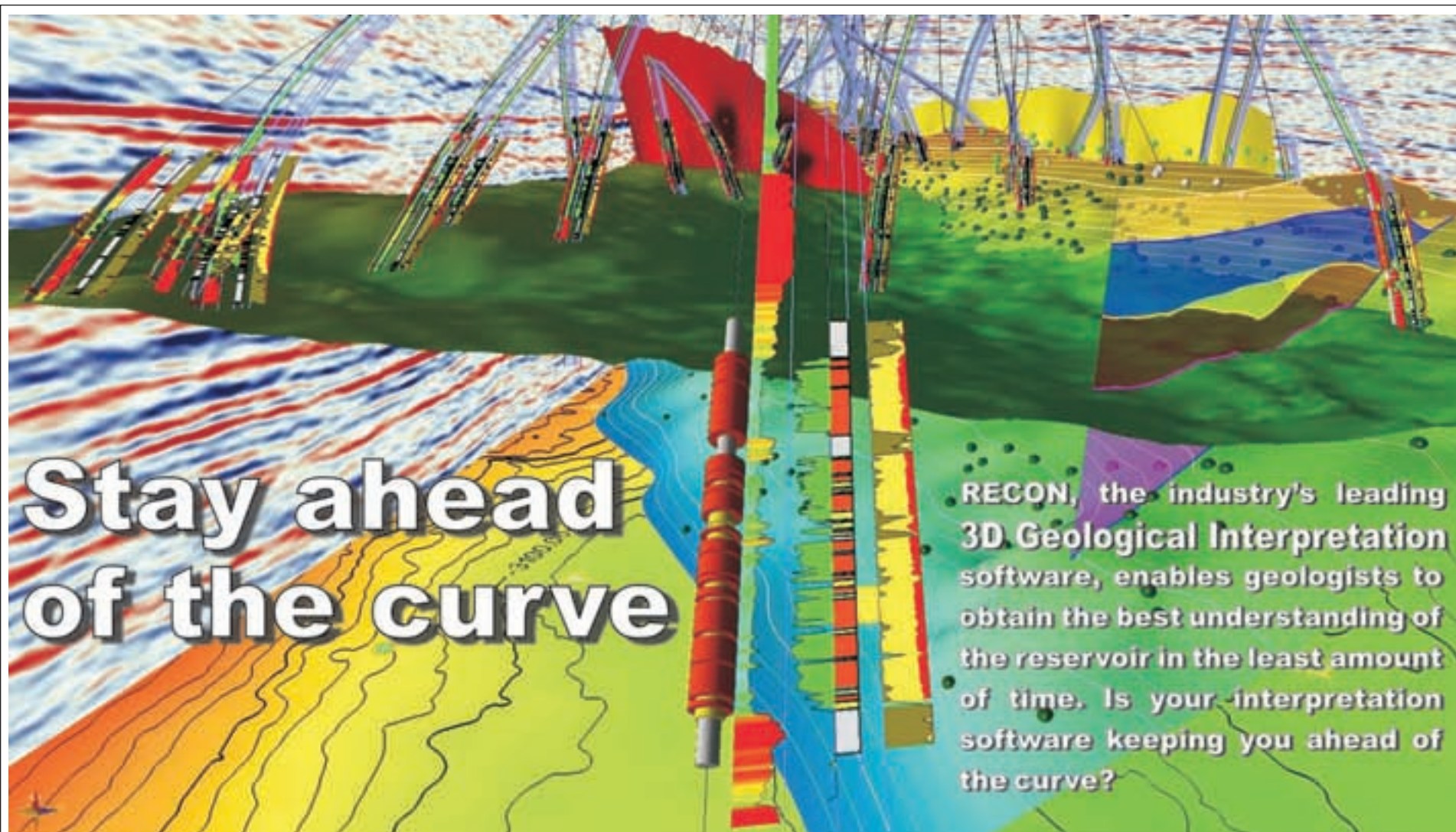
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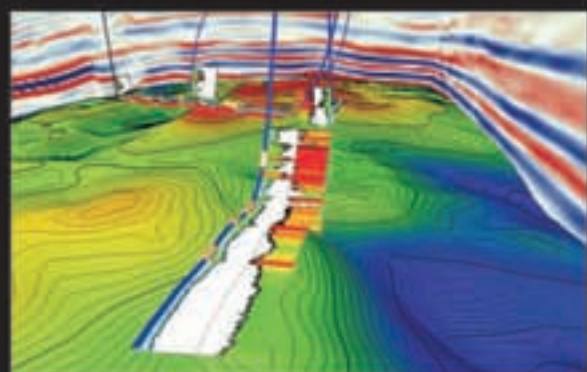
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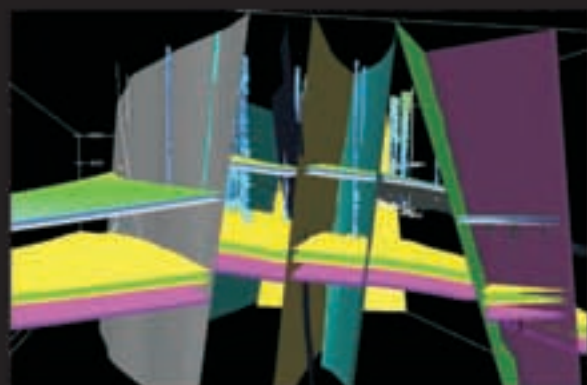
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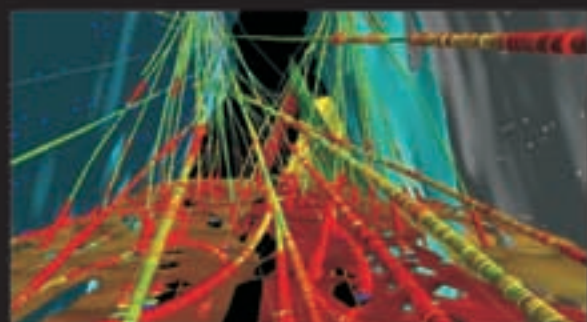
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'Panacea' to some, 'quaint' to another

New Energy: Problems and Promise

By BARRY FRIEDMAN
EXPLORER Correspondent

Admitting that there is no perfect solution to our energy needs, Hannes Leetaru believes that the enemy of the perfect shouldn't be the enemy of the good.

More to the point, Leetaru believes that future problems will look a lot like the ones we've had for decades.

"The most important thing to consider is that we need a reliable electricity grid," he said – and he believes one way to ensure that the grid is effective and diverse is to allow for the transportation of electricity from different areas.

The Division Energy Forum, sponsored by DEG, DPA and EMD, will be held at 5 p.m. Tuesday, June 9, at the AAPG Annual Convention and Exhibition in Denver.

The three speakers will be:
✓ Hannes Leetaru, speaking on "Our Energy Future."
✓ Sue Hovorka, of the Jackson School of Geosciences at the University

"For example, wind is a good source of energy in Wyoming," he said. "If the grid was extended and made larger (capable of carrying more electricity),

of Texas at Austin, speaking on "Risks and Benefits of Geologic Sequestration of Carbon Dioxide – How Do the Pieces Fit?"

✓ John Kaldi, of the University of Adelaide, Australia, and an AAPG Distinguished Lecturer, speaking on "CO₂ Sequestration – The View From Down Under."

then wind could be a greater mix for the national needs."

Leetaru, an AAPG member, geologist with the Illinois State Geological Survey



Leetaru

and one of the speakers at this year's AAPG Division's Energy Forum, says that part of the difficulty in achieving this is overcoming the long-held beliefs about alternative forms of energy on both sides of the equation – those

who think it will be a

panacea and those who think it's quaint. "Both nuclear and coal have a negative public perception and it is already becoming very difficult to build new coal-fired power plants that do not have carbon sequestration capabilities," he said.

Nuclear and coal, indeed, carry with them more than their share of baggage – but Leetaru says there are problems with other alternative sources.

Even those more universally accepted. "As for the darlings of the alternate universe, solar and wind," he says simply, "they're unreliable," adding that it is probably wise not to get too carried away by the promise of renewable energy in the first place.

Running down the roster, Leetaru sees both the problems and the promise:

✓ **Solar** is geographically limited to the southwest United States. Places like Illinois do not get enough sun and it rains too much. Also in the winter, the states in the northern latitudes, such as Michigan, have too short a day to get much help from the sun.

✓ **Wind** also is geographically limited. The best wind (consistent wind) occurs in the western half of the United States. Illinois is the last eastern state to have reliable wind energy.

That does not mean that it cannot be done in the eastern part of the country, it just is more difficult and less commercial.

✓ **Hydroelectric** is limited by the regulatory framework and by location. It is almost impossible to build a new dam because of the incredible environmental impact it would have on the environment, he points out. You would be taking pristine valleys and filling them with water.

✓ **Biofuels** are very controversial because they may cause degradation of the environment.

It would be sad to have the Amazon Rainforest cut down so we can have more energy from sugar cane, he observed, which is a current challenge in Brazil.

✓ **Carbon sequestration** also is geographically limiting, because it requires sedimentary rocks that have porosity and a seal that would keep the CO₂ within the target reservoir and not allow its migration to the surface.

It's not that Leetaru is pessimistic, he insists. He's just realistic.

Speaking of nuclear and coal, he says, "At this time there are no other viable alternatives that could totally replace these two fuels."

"With present technologies," he added, at best, "renewable would be limited to about 25 percent of our energy mix."

It is not, as many suggest, going to be cheap or easy. "The cost of electricity," he said, "is going to go up. The goal is keep it reliable." □

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Project Changed the Environment

Michael Jacobs will talk about the "Cooperative Aquifer Restoration Project, Fort Peck Indian Reservation – A Multi-Agency Success Story," in Denver at the DEG luncheon during the AAPG Annual Convention and Exhibition.

The luncheon will begin at 11:30 a.m. Wednesday, June 10. Tickets are \$40.

For more information go online to www.aapg.org.

By **BARRY FRIEDMAN**
EXPLORER Correspondent

It started as a "technical" situation, nothing more. A problem to be corrected. A challenge to be conquered.

It led to something profound. A group of people who learned to trust, and a scientist who developed a deep connection with the community.



Jacobs

A critical project phase of high concern that didn't just successfully end, but that ended successfully.

That's what happened at the Fort Peck Indian Reservation in Montana, to a group of

residents concerned about having safe drinking water, and to AAPG member Michael A. Jacobs, a geoscientist with Pioneer Natural Resources USA in Midland, Texas.

His project, simply enough, was to evaluate the geological setting of a highly saline groundwater contaminant plume



Photo by Chrisea Tyrrell, Fort Peck Tribes, Office of Environmental Protection

The PNR-1WD during drilling, with the town of Poplar water tower in the background.

and to build and design a plume capture and remediation system for the 426-acre Biere #1-22 Aquifer Restoration Project Site at the East Popular Oil Field in Montana, on land controlled by the Assiniboine and Sioux at the Fort Peck Indian Reservation.

But what happened and what was accomplished are two different things.

Personal Best

After discerning there was indeed a problem, Pioneer committed \$6 million dollars to plug an abandoned well that was leaking highly concentrated salt water into the shallow aquifer that is the sole source of drinking water to area residents.

For Pioneer, however, committing money, was just one part of the problem – and in many ways the easiest to overcome.

More difficult, according to Jacobs, was forming the trust between organizations that don't always trust each other – or, at the very least, haven't always trusted each other's motivations, especially with all the competing interests of public, private and indigenous concerns.

Jacobs, who has been with Pioneer for 12 years, says the coming together of those entities was not only the key to the project's success, but also the point.

"I think that this project is a model project," he says, alluding to how the team had to include the views and agendas of a

diverse group of organizations, including agencies from the U.S. Environmental Protection Agency, the U.S. Geological Survey, the Fort Peck Assiniboine and Sioux tribes and the state of Montana.

Jacobs said not only his company but all of the organizations involved participated in an extraordinary data sharing effort, working side-by-side over the course of the past two years conducting field work and providing technical expertise and interpretations.

"A number of town hall and tribal executive board meetings and team technical meetings were held in which the progress of the project was discussed and questions were taken and addressed," he said, adding that the meetings themselves were handled in different offices across the country.

Jacobs says the company, the tribes and the different organizations weren't the only ones who experienced a new perspective.

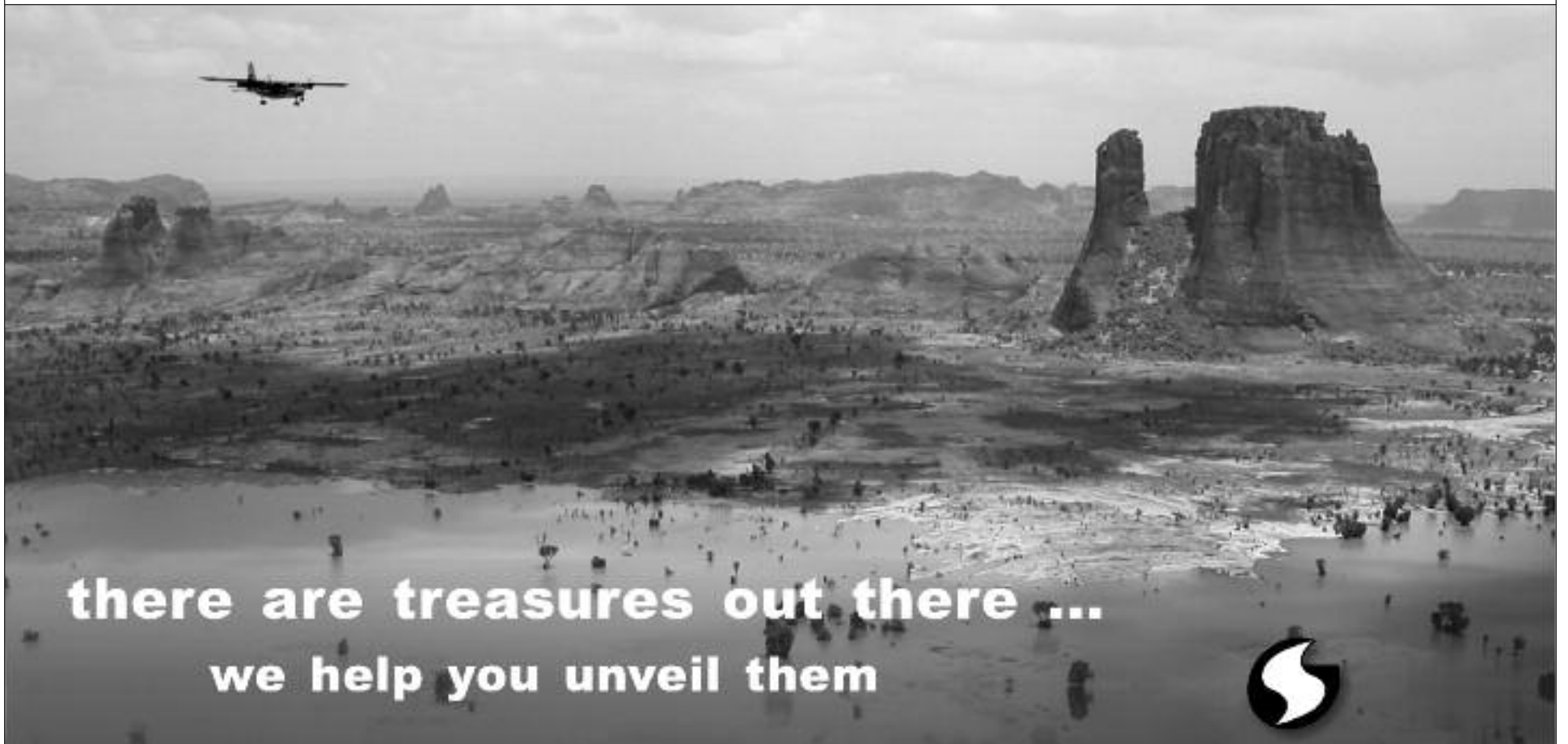
"I have to admit that my personal motivation in this project was at first purely scientific," he said. "I was driven by the challenge of unraveling the geology and understanding the hydrologic regime of the Biere Aquifer."

But then, he said, as the project progressed it went far beyond the purely scientific realm.

"After meeting the local folks and getting to know them my priorities and motivations became more personal," he said.

"I wanted the project to be successful and one that would have a beneficial result

See **Fort Peck**, page 44



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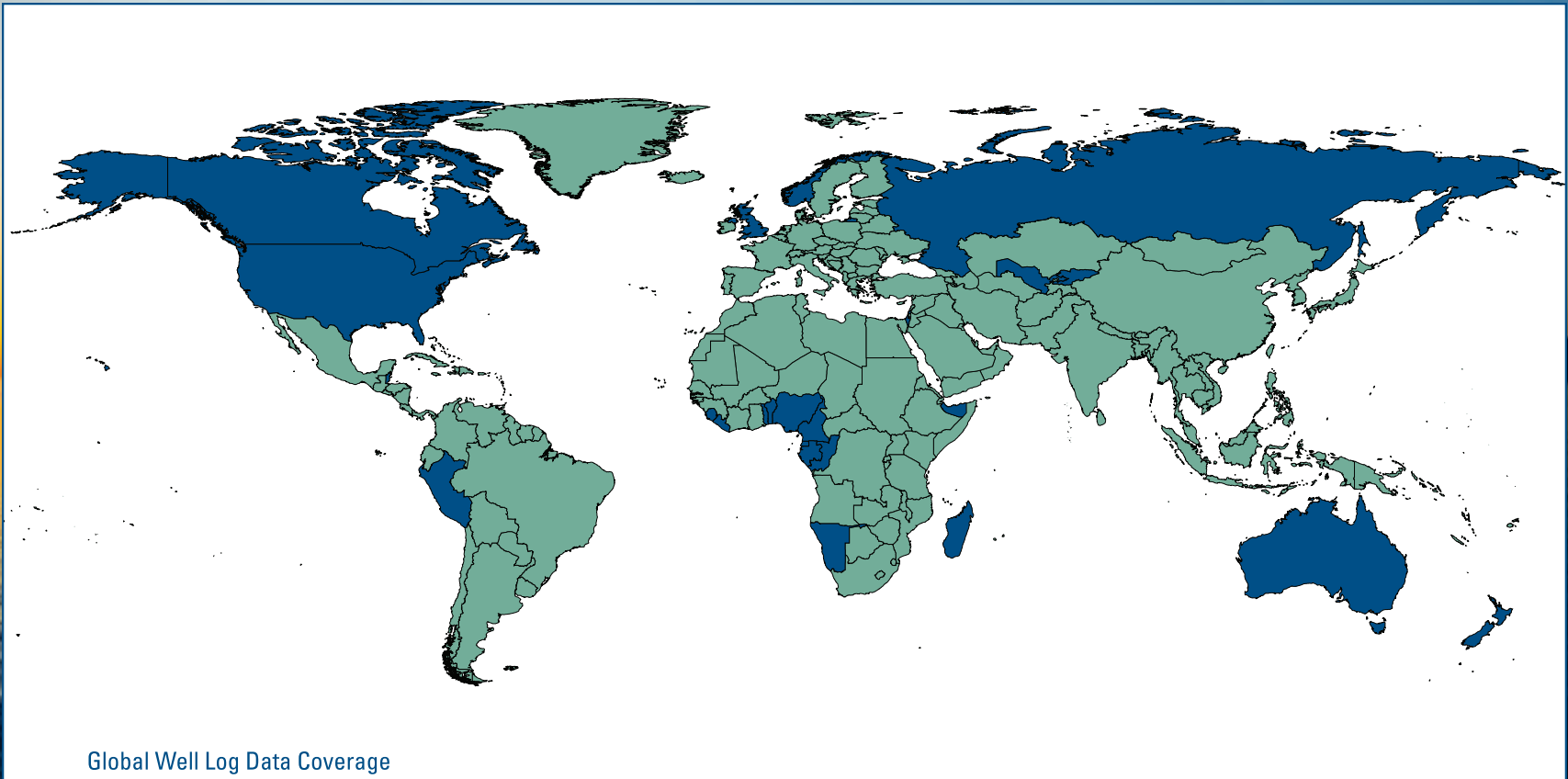
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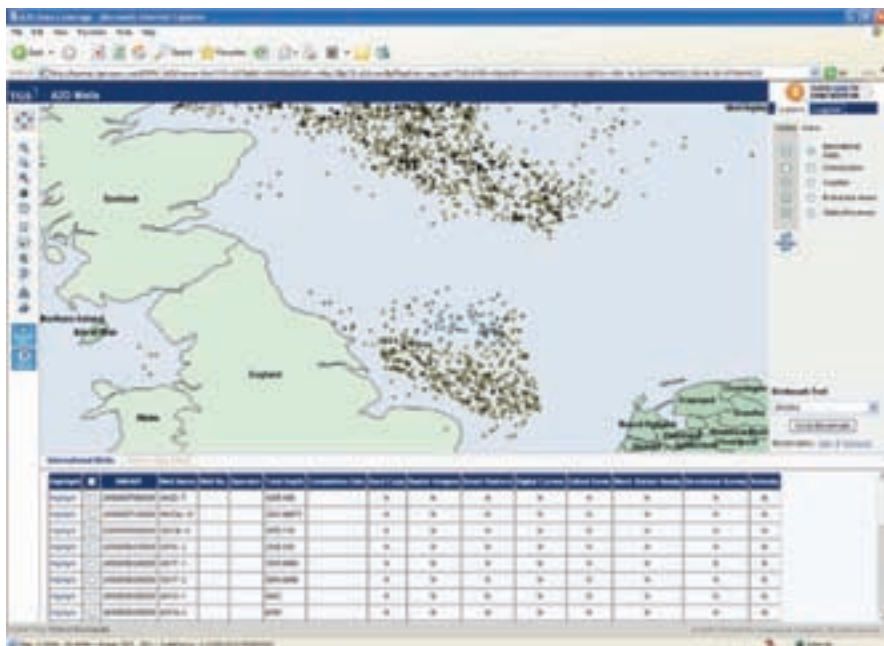
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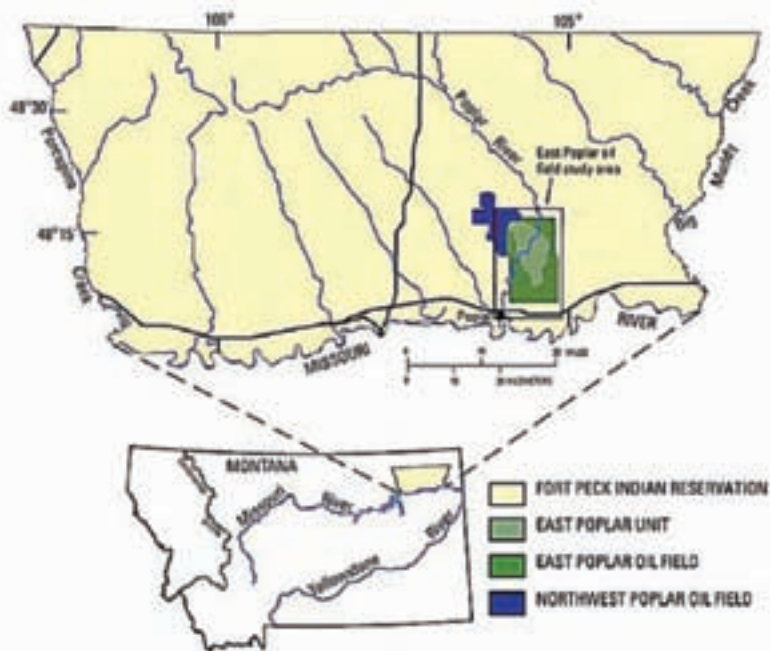


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Fort Peck from page 42

of restoring the damaged aquifer as much as we could possibly and technically achieve.”

Do the Right Thing

The project started scientifically enough, when the USGS in the early 1990s began studying widespread brine contamination in the area. The study revealed a number of potential sources.

Pioneer became involved in 1999, Jacobs said, when the company was informed that in 1986 a well that the company inherited was not properly plugged.

“Basically, the real story of the project ramped up in 2006 when Ed Hance transferred to Dallas from Pioneer’s

Argentina office to take over the HSE department and asked me to take a look at the project,” he said. “Being an experienced hydrogeologist and a past exploration geologist as well, I looked at it as I would any other prospect. I grabbed every well log and every piece of information, published and unpublished, and began working the geology from scratch.

“As I made my maps and cross-sections I began to realize that the Biere brine plume was clearly definable within a discrete water-bearing channel and was separate from other gravel channels in the area,” he continued. “The discovery that this channel was both identifiable and discrete made it an ideal candidate for a restoration effort.

“After presenting these findings to management it was agreed upon that this project was not only feasible but the right thing to do.”

The project specifically included a 7,600 injection well, 10 brine extraction wells, more than 15,000 feet of two-inch and 5,080 feet of four-inch SDR-7 poly flowline, as well as two brine gathering systems with five-500 barrel storage tanks and three 250 barrel brine/crude storage tanks.

The system started in August 2008, is 90 percent operational and is currently removing approximately 3,500 barrels (147,000 gallons) of brine from the aquifer. To date it has removed over 12.5 million gallons since it began operation. Once the system is 100 percent operational, he says, it should be running at around 250,000 gallons a day.

“The aquifer will respond immediately to the restoration,” he said. “However, the process will most likely take up to 15 years to restore the aquifer to significant beneficial levels.”

The Secret of His Success

At the AAPG annual convention in Denver, Jacobs will be presenting not just the project’s technical aspects or just the specifics of the restoration activities in cleaning up oil field brines, but also the benefits of multi-agency cooperation in environmental stewardship – and how that kind of cooperation and dedication leads to success.

Aside from learning, he says, that working in extreme cold and adverse weather conditions can be very challenging – especially for a West Texas geologist – Jacobs admits something more basic.

“I would have to say that one thing I learned, geologically speaking, is that fluvio-glacial systems can be challenging to work on ... I don’t know that I have ever encountered a more complex heterogeneous depositional system than this.”

More importantly, he says, “I think the town learned, through public meetings and sharing of information, that the situation may not be as immediately threatening as previously thought.”

And then Jacobs wants to say something else, something about the people of the Fort Peck Reservation and the special relationship that formed – and it has little to do with the Department of Interior’s Environmental Achievement Award in 2008. It has to do with the members of the tribes.

“These folks are deeply spiritual, and their spirituality is deeply rooted in their environment and the resources.”

And keep in mind, this is coming from a man who has spent the past 25 years as a geoscientist while working for NASA at the White Sands Test Facility, Coastal Oil and Gas and Kerr McGee, to name a few.

“Environmentally speaking,” he mused, “I would not hesitate to say that these people are the original environmentalists. And you can quote me on that, also.” □

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'Far out' prospects explored

An 'Otherworldly' Hunt for Discovery

Jeffrey Kargel will be the speaker at this year's Energy Minerals Division luncheon, set Wednesday, June 10, during the AAPG Annual Convention and Exhibition in Denver.

Kargel, adjunct professor and senior research scientist in the Department of Hydrology and Water Resources at the University of Arizona, will discuss what we can learn about the Solar System from hydrocarbons.

By **BARRY FRIEDMAN**
EXPLORER Correspondent

It's not like anyone *forced* him to name his luncheon talk "Unconventional Far-Out Petroleum and Gas: Hydrocarbons from Mars to Titan and Beyond," but Jeffrey S. Kargel now seems stuck with it.

Or, perhaps he now has exactly what he wants. It all depends on one's perception.

"It is simply a play on words," he says, laughing, and you get the sense he knew the question was coming.

But there's a serious side to his answer.



Kargel

Kargel, who is an adjunct professor and senior research scientist in the Department of Hydrology and Water Resources at the University of Arizona, says the point of the title that he'll explore in Denver has to do with perceptions – and

getting people to think in another dimension.

For him, that's a necessity.

Kargel is looking for hydrocarbons not only in new places (others do that), but looking for them in places where nobody has ever been, like Mars.

And he's not just tilting at interplanetary windmills. His sights are on "objects within this solar system where we know that hydrocarbons exist in various amounts."

The search, he says, is extensive and promising.

"Not only Mars," he says, "but Saturn's moon, Titan, and other objects known to contain hydrocarbons" are part of his talk, his study and his universe.

For example, it is known that on Titan, the amounts of methane are enormous – and as for Mars, "the total amounts are unknown, but we see methane coming out of the interior."

Soaring With Apollo

Kargel, who has a doctorate in planetary sciences, is a founding member of the Working Group in Glacier and Permafrost Hazards in Mountain Areas and has done extensive work on global change both on earth and other planets, believes we are being too myopic in thinking Earth is the only bastion of biogenic petroleum and gas.

His interest for things otherworldly, if you will, goes back to his childhood.

"My passion for planetary science started as a child," explaining that his grandmother's interest in meteorites and in the budding area of space exploration was 'infectious.'

It was during the Apollo lunar programs – specifically the 1968 Christmas Eve sermon by the Apollo 8 astronauts – that he says hooked him for good.

"I then watched all the astronaut launches and moon walks and other events throughout the Apollo program," he said, and that experience, along with watching the early Mariner 9 images of Mars while delivering newspapers, sealed the deal.

He wanted to be an astronaut; instead, though, he trained in geology and planetary sciences. And now he has the best of both worlds – definitely, no pun intended.

For Kargel, there's something literally cosmic about it all, something exciting.

"I am poised at the forefront of geological and scientific exploration of our solar system," he said.

Kargel wants to be able to draw from knowledge of the Earth to develop insights that will help understand, develop and ultimately explore the solar system.

The Final Frontier

To put it simply, Kargel says he wants to be able to draw from knowledge of the Earth to develop insights that will help understand, develop and ultimately explore the solar system.

But big questions have big costs and loud critics, so Kargel knows that looking for hydrocarbons on distant planets is not a decision that geologists can or will make themselves.

"It is a decision that the president and the American people, the taxpayers, will have to make."

When they might want or need to is anyone's guess, but it will happen, he says, for it is widely believed that the Earth is the Solar System's "poor citizen" in petroleum and gas deposits.

Kargel puts it this way:

"I mean that some other objects – especially Saturn's moon, but many others as well – are endowed with far more carbon than Earth has, even orders of magnitude more on grams of carbon/gram of planet basis. Titan literally has lakes and seas of liquefied natural gas. Carbonaceous asteroids are thoroughly impregnated with petroleum-like and asphalt-like hydrocarbons."

And what, if any, are the ethical considerations of all this, of extracting such hydrocarbons from other planets?

"If a planet is thought to harbor life, or may harbor life, like Mars, that sets in one camp," he said. "If there is almost no possibility of life, it's a different matter."

But that is all in the future in, literally, a distant land (or series of lands). For now, though, he wants you to know, "I love my career. It is simply amazing to be able to ponder big questions about other worlds." □

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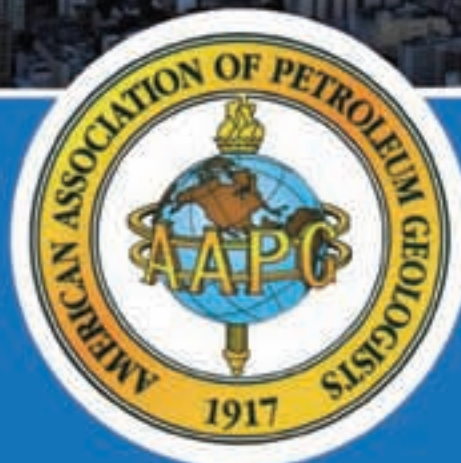
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WASHINGTONwatch

Clean Energy Act's Details Debated

By DAVID CURTISS

Throughout the 2008 U.S. election cycle the need to deal with climate change was a recurring theme.

Both President Obama and Democratic leaders in Congress promised swift action to reduce U.S. carbon and other greenhouse gas emissions. And within the first 100 days of the new administration, both ends of Pennsylvania Avenue began work to fulfill that promise.

On April 17, the U.S. Environmental Protection Agency (EPA) issued a finding that carbon dioxide and several other greenhouse gases endangered public health and welfare – a finding that requires EPA to issue a rule to regulate emission of these gases under the Clean Air Act.

This move was anticipated based on the president's previous statements. But the White House and EPA admit they would prefer to have Congress develop a specific legislative framework for regulating greenhouse gases rather than use the 30-year-old Clean Air Act.

* * *

The wrangling to develop legislation began just after the November 2008 election, as Democrats elected leaders and committee chairs.

In a surprise move, and with the tacit support of Speaker Nancy Pelosi (D-Calif.), Rep. Henry Waxman (D-Calif.) challenged and beat incumbent chair



Curtiss

John Dingell (D-Mich.) for leadership of the House Energy and Commerce Committee.

Waxman, a supporter of limits on greenhouse gas emissions, then shuffled the subcommittee chairs, asking Rep. Ed Markey (D-Mass.), another strong supporter, to head the Energy and Environment subcommittee.

Waxman and Markey started working on a climate change bill, and in early April unveiled the American Clean Energy and Security Act of 2009. The bill has not been formally introduced as of early May, and still lacks detail on a number of critical provisions.

It is a discussion draft to explore the issues, address the legislative gaps and gauge where members stand.

That is, are there sufficient votes to pass the legislation out of subcommittee and full committee?

* * *

The discussion draft has four titles:

✓ The first is a clean energy title with

It is a discussion draft to explore the issues, address the legislative gaps and gauge where members stand.

several provisions, including a federal renewable energy standard, requiring power suppliers to begin supplying at least 6 percent of their base load from renewable sources in 2012, growing to 25 percent in 2025.

It promotes the development and deployment of carbon capture and storage technologies. It introduces a low carbon fuel standard for transportation fuels, designed to stimulate the development of advanced biofuels. And it promotes the deployment of a modernized, smart electrical grid.

✓ The second title deals with energy efficiency of all kinds, ranging from buildings and homes, to appliances, transportation and utilities.

✓ The third title seeks to address global warming by establishing a federal cap and trade system for greenhouse gases.

The model proposed is based closely on recommendations from the United States Climate Action Partnership, which

includes oil and gas producers ConocoPhillips and Shell. The goal of this title is to reduce greenhouse gas emissions by 83 percent below 2005 levels in 2050.

✓ The fourth title deals with the impact of transitioning to a clean energy economy. It creates a program to compensate for the costs associated with this transition, to ensure U.S. businesses remain competitive with overseas firms not operating under similar restrictions.

It provides assistance to consumers, and for those transitioning into green jobs.

The title also encourages broad deployment of clean energy technologies to other countries and forms an interagency commission to develop a coordinated federal response to adapt to changes induced by global warming.

During the week of April 20, the House Energy and Environment subcommittee held four hearings on the draft legislation to receive testimony from 68 witnesses and begin deliberating the draft provisions.

* * *

Where is all of this heading? The initial timeline was for the subcommittee to "mark up" the bill the

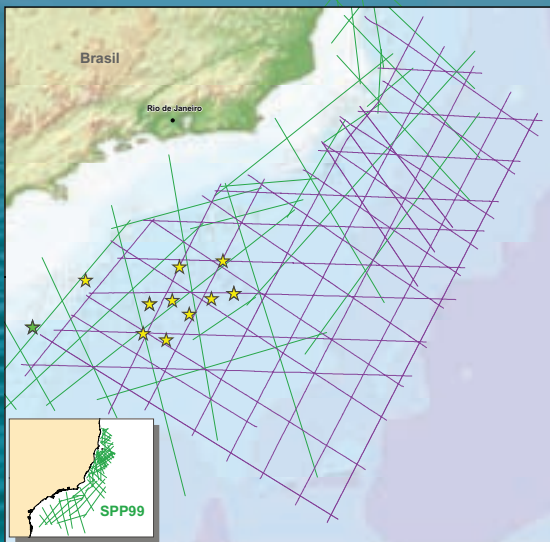
See [Washington](#), page 54



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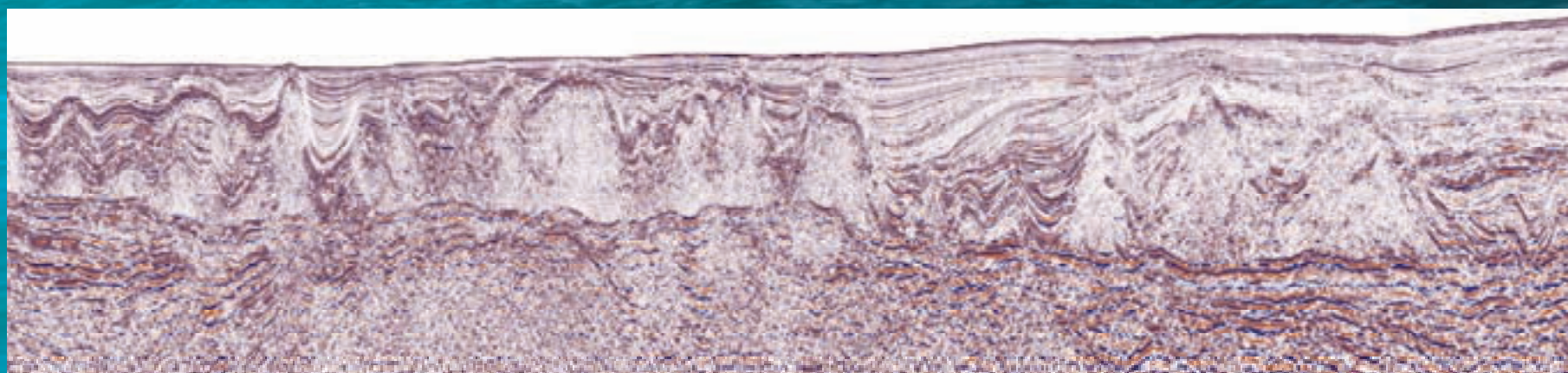
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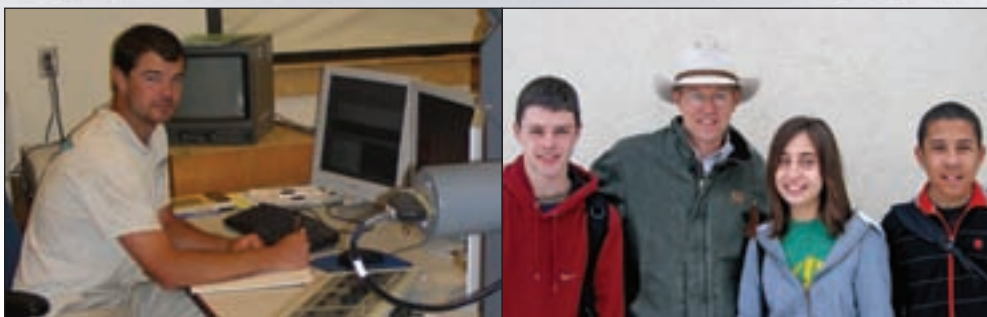
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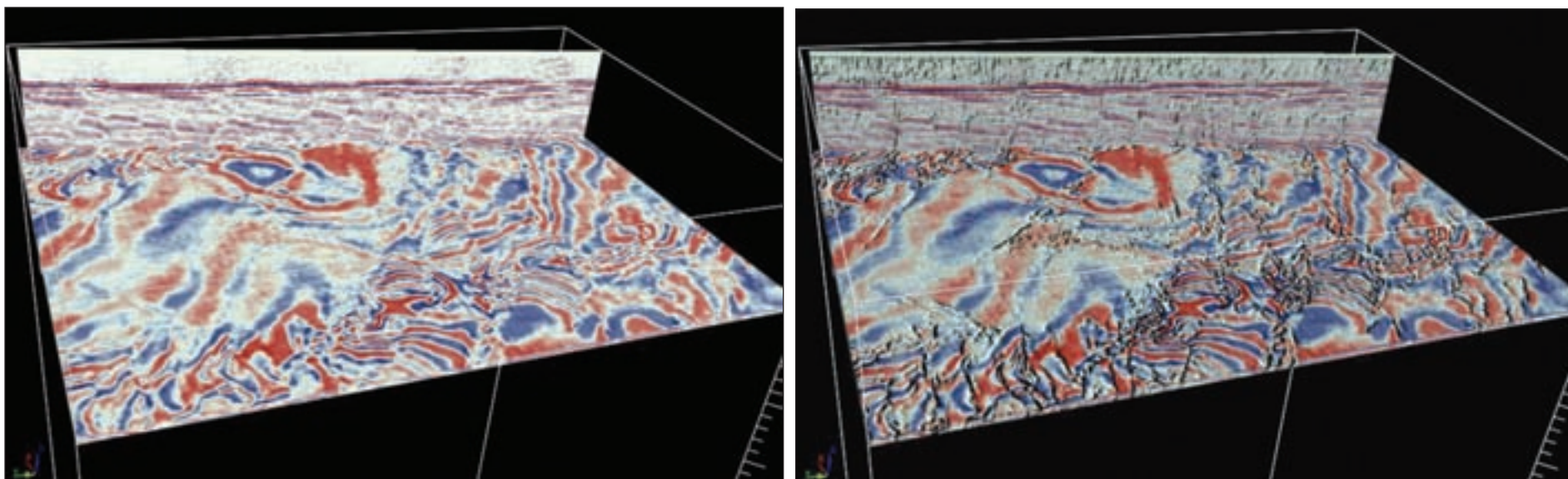


Figure 1(a) – Arbitrary line and timeslice through the 3-D seismic amplitude volume. Figure 1(b) – Same timeslice and arbitrary line as in figure 1(a), but corendering amplitude (conventional blue-white-red color bar) and coherency attribute (black lines show reflection discontinuities). Note the improvement in fault definition compared to the conventional amplitude display.

A Powerful Tool for Mapping Faults

(The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month's column examines how corendering can aid fault interpretation.)

By ALEXANDRA KIRSHNER
and BRUCE HART

High-resolution 3-D seismic data provide geoscientists with tremendous opportunities to study subsurface structure and stratigraphy. When used

appropriately, the visualization tools provided by seismic interpretation software packages facilitate structural interpretations and provide insights to relationships and features that otherwise might be hidden.

In this column we illustrate the use of a technique known as corendering to assist fault interpretations in a structurally complex area.



Kirshner



Hart

Simply stated, corendering is a computer graphics tool that allows an interpreter to view two data volumes simultaneously.

Many seismic interpreters continue to use amplitude volumes for fault interpretation.

They use reflection terminations, reflection offsets, changes of dip and other lines of evidence to identify faults. Coherency and related

attributes such as semblance quantify differences in trace shape between traces in a 3-D seismic survey.

Simplistically, high coherency values correspond to laterally continuous reflections, whereas low coherency values are associated with sharp boundaries, such as those associated with faults, channel margins and other features.

Although coherency volumes are commonly examined alone for fault

[continued on next page](#)

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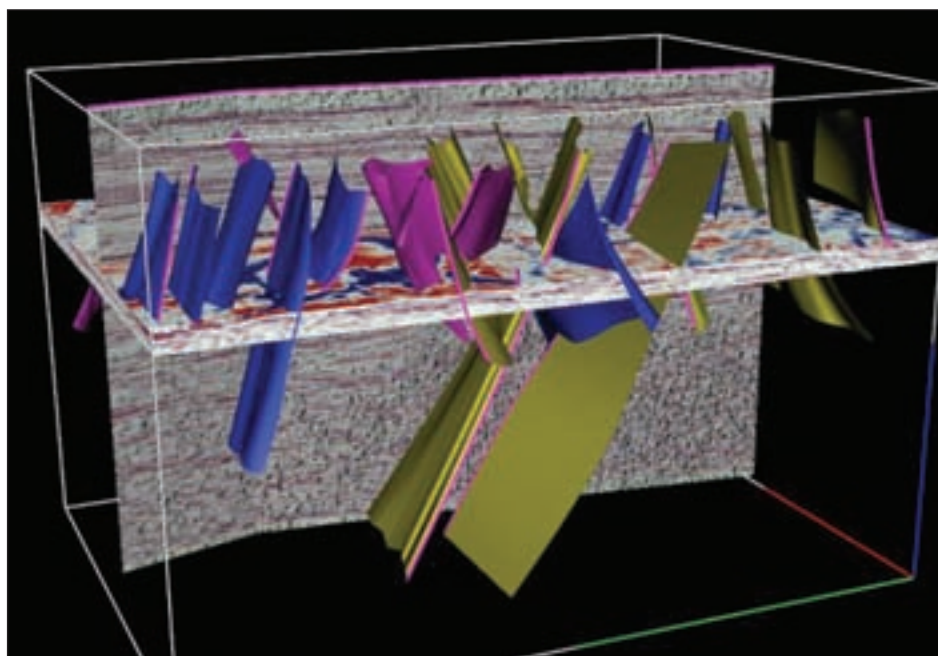


Figure 2 – Visualization of faults and corendered seismic data. More than 40 faults were mapped in the data volume, but for clarity not all are shown in this display. Although seismic data quality deteriorates below the Cretaceous, most of the faults demonstrably die out downward at this level.

continued from previous page

mapping, the simultaneous display of coherency and amplitude volumes through corendering can be a powerful tool for identifying and mapping faults.

The images presented here combine those two volumes by using color (conventional blue-white-red color bar) to display the amplitude information and shading (as if a light were shining on the data) to display the coherency attribute.

* * *

A 300-square-kilometer 3-D seismic dataset from the Western Desert of Egypt (courtesy of Apache Egypt and the Egyptian General Petroleum Co.) provides an exceptional opportunity to illustrate the benefits of corendering amplitude and coherency data.

This structurally complex area underwent multiple episodes of tectonic deformation in the Mesozoic and Tertiary. A series of normal faults affects Cretaceous strata, but few of these faults extend down into the Jurassic and underlying strata.

Furthermore, most of these normal faults terminate upward at a Paleocene unconformity.

The basin geometry is controlled by a normal fault that strikes approximately NW-SE. The survey area contains three families of faults that trend roughly parallel to the principal fault.

These fault families contain segmented normal faults, both with splays of the same family and between differently oriented families.

Figure 1a shows an arbitrary vertical transect and intersecting timeslice that illustrate the expression of the faults in the amplitude data. Although some faults are

readily identified in the vertical transect, the expression of the faults in the timeslice is more cryptic.

Figure 1b displays the same arbitrary line and timeslice, but this time corendering amplitude and semblance.

Notice how the combination of coherency lineations and reflection offsets highlights the faults on both cuts through the data volume.

Similar corendered data displays were used to map more than 40 faults across the 3-D survey area. Many of these faults are shown in figure 2.

We assert that it would not have been possible to map many of these faults without the aid of corendering.

* * *

Picking faults in a 3-D seismic cube represents only the first part of a structural interpretation.

The normal faults mapped in this project span isolated growth, isolated-yet-interactive growth and coherent growth models. Analyses of these faults would provide fundamental insights into how families of normal faults grow.

Additional work might include the generation of Allen diagrams or other types of fault-seal analysis. Fault networks might be studied to reconstruct the tectonic evolution of the study area.

Whatever the ultimate goals might be, using corendering to improve fault mapping will improve the robustness of all subsequent analyses. □

(Editor's note: Kirshner is a graduate student at Rice University, and Hart is director of shale, seal and pressure systems for ConocoPhillips in Houston. Both are AAPG members.)

Registration Opens for 3P

Online registration will open in June for AAPG's inaugural 3P Polar Petroleum Potential conference – an intense and comprehensive look at the geology and exploration potential of the entire Pan-Arctic area.

The conference, sponsored jointly with RosGeo, will be held Sept. 30-Oct. 2 at Gubkin Russian State University of Oil and Gas in Moscow, Russia.

"3P Arctic" is a geological/geophysical conference and exhibition focused on the circum-Arctic basins that are within the Russian, Norwegian, Greenlandic (Danish), Canadian and Alaskan onshore and offshore basins.

The meeting will bring together for the

first time the professionals and experts working on these regions, with a technical program comprising 15 sessions, 125 oral presentations and more than 150 poster sessions.

The conference's main themes are:

- ✓ Resource and Exploration Potential of Petroleum Provinces within Russia, Canada, Norway, Greenland and Alaska Basin.
- ✓ Tectonic and Paleogeographic Evolution of the Arctic in the Phanerozoic.
- ✓ Circum-Arctic Plate Tectonic Models.
- ✓ Geodynamic Modeling of the Arctic Margins.

For registration and meeting details go to www.3Parctic.com.

June 2009

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Offshore Technology Conference

Thanks to everyone who came along to see our presentation "3D Visualisation and New Tools for Structural Modelling" which took place on Monday 4th May.

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Visit our booth (#738) to see the features in the June software release of Move2009.2 or to speak to one of our representatives about your upcoming projects that might benefit from our consulting and training services.

Along with our Upstream Technology Alliance partners Badley Geoscience we are highlighting the various investment initiatives we are making in the next generation by showcasing some of the work undertaken by our academic and research partners.

Unfortunately, this year we are unable to share a wee dram of whisky with you at the end of each day. Instead we are holding a competition to win a bottle of chosen Malt Whisky. Come by our booth to enter the draw.

Would you like to schedule a time-slot with one of our Geologists? Email your request to events@mve.com.

Release of Move™2009.2 in June

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This month Move™2009.2 will be made available to maintained clients. New features in this version include:

- Forward modelling in 2DMove™,
- An updated user interface across the Move components,
- 4DMove™ GIS integration - Google Earth™ and Google Maps™.

Last month we showcased the new features in a "Move™ Development" webinar for our maintained clients. We'll update you on how these went in July's edition of Structure World.

Not had a chance to see the new features? Email help@mve.com.

Interpreters Tip: Reconstruction of Eroded Surfaces

When building a geological model, it is common for the original structure to have been truncated by erosion, therefore being able to reconstruct the eroded horizons in 2D and 3D, whilst honouring the structure of the area, becomes an extremely useful tool for geologists. Horizons are used to constrain the evolution of structures hence it is important that these eroded surfaces and horizons are reconstructed to reflect the original structure and to allow more accurate representation and interpretation of the geology.



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In compressive tectonic settings, it is typically assumed that bed thickness is preserved during deformation although bed thickness can vary along strike. This behaviour adheres to the flexural slip theory.

In Move™ component 2DMove™, the Construct Bed tool allows the user to reconstruct eroded surfaces when working on sections. The method by which this can be done is quick and precise, and uses the existing horizon geometry as a point of reference to construct the eroded horizons. With this tool, beds can be constructed to retain constant thickness or can be created at an angle to the reference bed to produce a variable thickness across a section.



Figures 1&2: Original horizon and reconstructed fold using the construct beds toolbox in 2DMove™.

Where multiple reconstructed cross sections exist, it is possible to link these sections to create a 3D model that retains the structure in every section, including thickness variations along strike.

In conjunction with the parallel thickness option, the Construct Fold Surface tool allows the user to reconstruct horizons where a 3D surface already exists. This reconstruction method can be used when no subsurface data is available in order to infer the buried part of the structure.

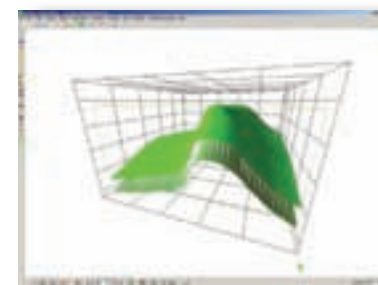


Figure 3: Similar fold created using the construct fold surface tool in 3DMove™

For further information on using Move in eroded surfaces email help@mve.com.



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The structural geology experts

Geo-work force survey findings

It's a Tough Place for a Woman

The AAPG Professional Women in Earth Sciences luncheon will be held in Denver at 11:30 a.m. Wednesday, June 10. The topic is "Women in the Energy Industry: Why Do They Go? Why Do They Stay? What Does This Mean for You?"

Christine Williams and Chandra Muller will discuss the findings of the AAPG global work force retention survey, and Julie Kupecz, technology adviser with Shell E&P, will present a talk on "Career Ownership and Personal Opportunity in Today's Industry: Redefining Success."



Williams



Muller

By DIANE FREEMAN
EXPLORER Correspondent

The questions have been answered, the responses have been recorded and now the results of a long-awaited work force retention survey of women geoscientists will be presented in Denver at the AAPG Annual Convention and Exhibition.

The AAPG-sponsored survey was undertaken to find out why so many women scientists leave the industry. It targeted women geoscientists of all ages and at every stage of their careers.

Preliminary results indicate that many women have left the energy industry and not returned to it because of inflexible and unfriendly family policies.

"There was concern among the respondents about work/family issues and work balance, and many of the respondents feel there could be improvement in the industry," said Chandra Muller, one of two University of Texas professors who analyzed the survey

data and will present the key findings at the conference.

Muller is a sociology professor who studies educational inequality – especially in the mathematics and science fields.

She will present the findings along with the other analyst, Christine Williams, a University of Texas professor who studies gender discrimination and workplace inequality.

The survey was designed to help improve the workplace climate for women geoscientists and retention of lost talent.

Balancing Act

The survey's early results have pointed to concern about work/family and work balance issues in the energy industry, Muller said.

"My sense from knowing other industries is that the energy business is worse than other industries," she said. "It's conceivable that it's because it's male-dominated – but the nature of the work doesn't help any. What I perceived in the early findings is that the constraints of the

"Some respondents ... felt they hadn't changed enough to keep up with the times."

industry – the travel and off hours – could be organized in ways that are more amenable to work flexibility."

The lack of change and stagnation in the workplace also was a concern among the participants in the survey.

"Some respondents felt that things had changed," Muller said, "but others felt they hadn't changed enough to keep up with the times."

Respondents felt that energy companies do a poor job in addressing women's personal health issues and offering leave time to care for family members, job sharing policies and onsite childcare, she said.

Of the respondents who have left the industry, responses indicate that more than 30 percent do not anticipate returning to it. However, about 25 percent said they would return if part-time work was available, she said.

Muller said the industry is losing talent

because of its work policies.

"If they loosened up some constraints they might find more people who were quite talented in science," she said. "Currently, they're selecting workers from among people who are willing to have a disruptive family life, so they may not be accessing the best talent."

She pointed out that some businesses adopt more family-friendly policies for economic reasons.

"There's a much lower work force turnover and lower training costs," she said. "There's high loyalty and they may even end up paying workers slightly less because they get more people who are loyal to the company. Many companies have found that recruitment costs are saved."

"When you become a worker friendly company, you basically advertise a job and have people clamoring at your door," she said.

"What's coming out loud and clear from this survey is that the vast majority of these energy companies have the opposite reputation so their costs of operating are probably even higher," Muller said.

Only the Beginning

Over the past decade, even as women have increased their numbers in the geosciences, the reason why many left the profession has been rarely studied.

Edith Allison, co-chairman of AAPG's Professional Women in Earth Sciences

See **Survey Results**, page 54

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WEEK 3	Open Hole Log Analysis (Practical Interpretation of Open Hole Logs)	September 8 - 11
WEEK 4	Overview of Seismic Exploration: Seismic Acquisition and Processing, AVO and Attributes and 2-D / 3-D Interpretation	September 14 - 18
WEEK 5	Applied Subsurface Geological Mapping	September 21 - 25
WEEK 6	Seismic Interpretation Workshop	September 28 - 30
	Basic Reservoir Engineering for Non-Engineers	October 1 - 2

	PROJECT	FALL
WEEK 7	Phase I Initial Exploration - Deliniate Prospects - Drill Exploration Wells	October 5 - 9
WEEK 8	Phase II Assess Discovery - Refine Interpretation	October 12 - 16
WEEK 9	Phase II-A Field Development - Drill Development Wells	October 19 - 23
WEEK 10	Phase II-A Field Development Continued	October 26 - 30
WEEK 11	Phase II-B Explore for Additional Prospects	November 2 - 6
WEEK 12	Phase IV Field Performance Analysis - Results of Other Exploration Prospects	November 9 - 11
	Phase V Present Report and Project Results	November 12 - 13
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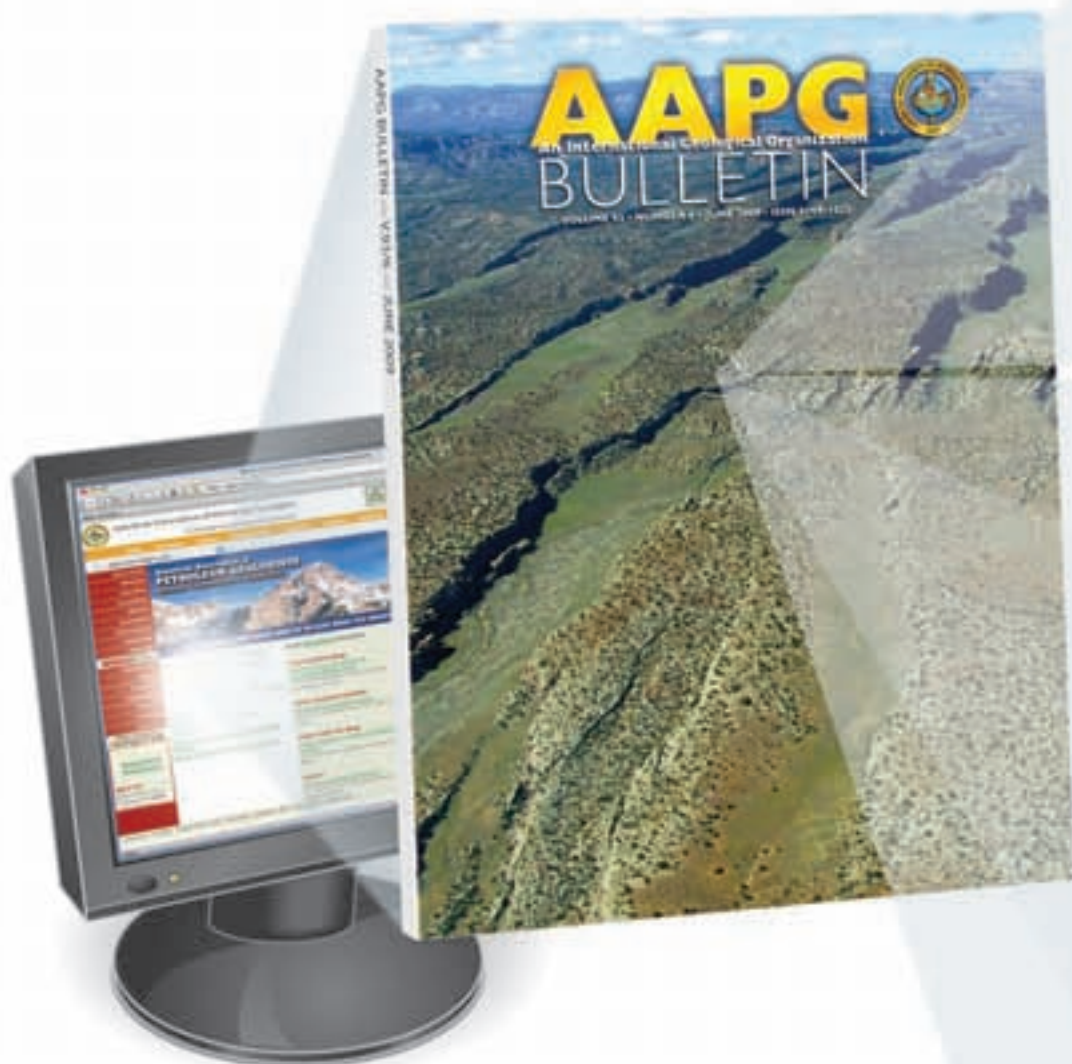
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*Bassem S. Nabawy, Yves Géraud,
Pierre Rochette, Nicolas Bur*



The reliability of methods for characterizing pore spaces with data obtained from mercury injection in highly permeable sandstone reservoirs is examined using Nubia sandstones in their type section in southern Egypt. New empirically derived equations are presented that better characterized highly permeable rocks.

Pearl River Mouth and Qiongdongnan Basins

Weilin Zhu, Baojia Huang, Lijun Mi, Ronald W.T. Wilkins, Ning Fu, and Xianming Xiao



Little information is currently available regarding the origin, migration, and accumulation of natural gas in the Pearl River Mouth and deep-water area of the Qiongdongnan basins, South China Sea. Geochemical data are presented that constrains the origin of gas, reducing exploration risk.

Salt-Detached Fault Growth

David M. Dutton and Bruce D. Trudgill



The Sembo relay system, lower Congo Basin, offshore Angola represents a complex amalgamation of faults with different throw patterns and initiation ages. Proper understanding of this and similar structures is required to assess the reservoir compartmentalization effects of fault growth in salt-detached settings.

Perpendicular Projection Plane

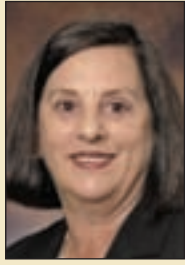
*Ivan Fabuel-Perez, David Hodgetts,
and Jonathan Redfern*



A new digital outcrop model improves the characterization and quantitative analysis of outcrop analogs with limited 3D exposure. This technique is applied to a low-sinuosity, fluvial-dominated succession within the Upper Triassic Oukaimeden Sandstone Formation, central High Atlas, Morocco.

Survey Results

from page 52



Allison

Committee, said the survey was the brainstorm of the committee and the survey began in mid-2006.

"This was prompted by a number of prior studies that were not specific to geology or petroleum but were looking at women in the STEM industries (science, technology, engineering and mathematics)," she said.

"The background information suggested that women were leaving the

petroleum industry at a faster rate than men, but there was no detailed information to confirm it," said Allison, exploration manager of the office of oil and natural gas for the U.S. Department of Energy.

The survey was completed at the end of September and included 2,048 respondents worldwide. It was a random survey of women who were former employees in the industry as well as those who returned to it and those with degrees in the field who never worked in it, she said. It was designed as a tool to improve the workplace climate.

The unbiased analysis by the UT professors will help point out any weaknesses in the data and also determine what can be officially concluded from the data as well as what would be inappropriate to conclude from it, Allison said.

The results of the study will be shared with AAPG leadership and the organization's corporate advisory board.

"We definitely hope that there will be follow-up on this," Allison said. "That will be determined by the results of the analysis."

Along with capturing current workplace best practices that are supportive of working women and that contribute to employer satisfaction, the survey also points to issues that contribute to employee dissatisfaction and that need to be addressed to maintain employee diversity and retention.

When the results are presented at the AAPG conference, seminar attendees also will be able to take part in a real-time survey using text-messaging technology. These responses will be compiled and compared to the results of the earlier survey. □

Washington

from page 48

week of April 27, but that was postponed to the first week of May and then postponed again. The full committee hoped to mark up the bill the week of May 11, enabling a committee vote before Memorial Day to meet Chairman Waxman's self-imposed deadline.

Speaker Pelosi had indicated a desire to have the House vote on the measure before the August recess.

But the politics of this legislation are very difficult. It is not clear that subcommittee chairman Markey has support to pass it out of subcommittee. So he is working with subcommittee members to make changes to the draft to gain the necessary votes for passage.

This is the legislative process in action, and its outcome is uncertain as we go to press.

On April 27, The Hill newspaper quoted Democratic leader Chris Van Hollen (Md.) saying, "The first thing we need to do is see whether we can come together around a consensus position in the committees in the House, and that's what we're working on. And then, of course, if we were able to arrive at that, the question is whether you would take it to the floor, or do you wait to see if anything develops on the Senate side."

"The chances of doing cap-and-trade in the Senate are much more difficult," he continued. "We recognize that."

Indeed, Senate leaders are trying to determine if and how to move climate change legislation this year. Senate Majority Leader Harry Reid (D-Nev.) has clashed with Senate Energy and Natural Resources Committee chair Jeff Bingaman (D-N.M.) about including a cap and trade provision in the committee's energy bill, currently being drafted.

Bingaman supports cap and trade, but fears that such a highly politicized provision could prevent passage of the entire energy bill.

The challenge in the Senate is perhaps best described by Reid, who indicated in an article by *National Journal* that global warming legislation would be his biggest headache between now and the 2010 election. □

(Editor's note: David Curtiss, head of AAPG's Geoscience and Energy Office in Washington, D.C., can be contacted at dcurtiss@aapg.org; or by telephone at 1-202-684-8225.)

Oxy President Sees Two-Year Wait for Rebound

Stephen Chazen, president and chief financial officer of Occidental Petroleum, told a luncheon crowd at the AAPG Pacific Section meeting in early May that he sees two years before a price rebound.

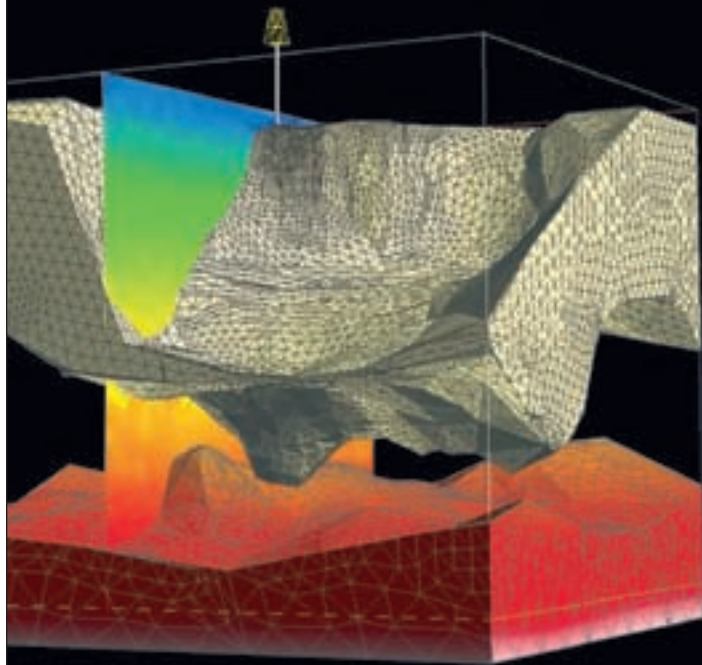
"But," Chazen cautioned, "we're pretty good about saying what will happen. We just can't say when it will happen."

The meeting was held in Ventura, Calif. General Chairman Tom Hopps said more than 500 persons attended.

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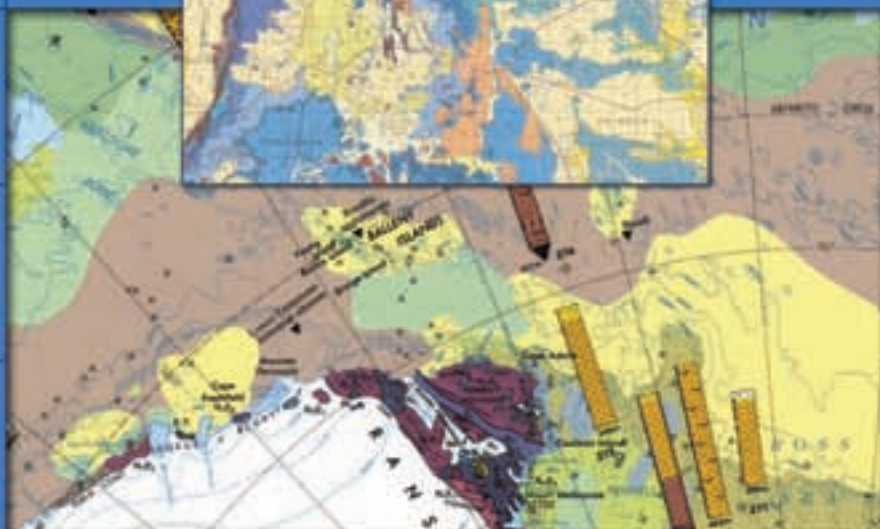
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- Atlas of Vectorized Structure Maps of Oil and Gas Fields: Louisiana (Part I)
- USGS Geologic Provinces Database: Michigan Basin, Appalachian Basin, & Illinois Basin Updates
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Technology, techniques shared

Space Seismic Gets Fine Tuning

Jim Reilly will present his poster "The Apollo Active Seismic Data and Lessons for PEGS" on Monday morning, June 8, at the AAPG Annual Convention and Exhibition in Denver.

Reilly's poster is part of the EMD session titled Lunar Field Exploration Equipment and Sample Documentation.

His co-authors are AAPG member Matthew Brzostowski and Drew Feustel.



Reilly

"Many of these things that you do for ... the space program are not too far to translate back into the terrestrial."

By DIANE FREEMAN
EXPLORER Correspondent

With apologies to novelist Thomas Wolfe, maybe you *can* go home again.

Just ask AAPG member Jim Reilly, a former geologist-turned-astronaut-turned geologist once more, who since returning to Earth is busy developing new tools for the space program that could eventually be used in the oil business.

Talk about the best of both worlds ... Reilly was chief geologist for Enserch Exploration when he left the oil industry in 1995 to join NASA, where he flew into space three times on Shuttle missions, logging more than 853 hours in space – including 31-plus hours of space walks and time on the ISS and MIR space stations.

Now working as vice president for product development for TAEUS International in Colorado Springs, Colo., Reilly believes several techniques currently being tested for the space program could be translated back to the energy business.

He'll present a poster about those ideas at the AAPG Convention and Exhibition in Denver, titled "The Apollo Active Seismic Data and Lessons for

PEGS (Planetary Exploration Geophysical System)," which is a prototype system for future lunar/Mars missions designed to acquire seismic data.

"A number of things we were testing could go right into the field," he said.

For example, scientists are now considering new types of geophones.

"We've also been talking about how geophones would be constructed to make them more robust for robotic applications," he said, although he added "that's still a ways off."

Must Have Been Moonglow

A critical component of NASA's lunar surface exploration program was the Active Seismic Experiment, he said, which involved collecting lunar data using a thumper, a rocket propelled grenade launched from a mortar, an explosives package and sensors.

The "thumper" was a hand-held device that the astronauts carried with them while looking at regolith soils on the moon.

"We (NASA) were looking at the soil on the surface of the moon – all of it is

mechanical debris from the impacts of over four billion years," Reilly said. "It's a fine dust."

The seismic program, which set off charges on the moon after the crew left, provided velocity and thickness measurements of the moon's shallow geology, which were helpful in calibrating the objectives of PEGS.

The gleaned data wasn't just for academic purposes – when NASA returns to the moon (tentatively eyed in 2020) it will be better prepared to study the lunar subsurface.

"Not only the moon," Reilly said, "but Mars. These two different geologies will require a lot of seismic to adequately describe the planet.

"We will be looking for resources on the moon and on the surface and subsurface of Mars," he continued. "We'll be looking for ice – and there's a possibility of seeing hydrates on Mars."

From Earth to the Moon

And as Reilly, a man of both worlds, likes to point out, some of the tools used

for the space program eventually may be applied to the oil industry.

"Many of these things that you do for the environment for the space program are not too far to translate back into the terrestrial," Reilly said.

"A lot of what we'll do on Mars will be the same as field work and looking at what kinds of materials are in the subsurface," he said. "We are seeing some methane on Mars and the same methane plumes in the atmosphere there."

The question is whether these are methane releases from biogenic sources and if they could be part of hydrate that is decomposing, he said.

"So if we find that on Mars, that's a great piece of news for us – it would give us water and fuel," he said. "If we have methane with water and oxygen, then that's an excellent rocket fuel. Those resources would be useful on Mars."

Space program scientists also are going to borrow some tools from the petroleum business in looking for analogs.

"As part of this whole effort, we're looking for earth analogs here that would mimic what we'll see on the moon," Reilly said.

For example, scientists are looking at ways of training people and what kinds of tools they will need on the moon, he said.

In fact, scientists on earth will prepare for space by continuing to go to the Taos gorge, which is very similar to parts of the moon and where "we've trained

See Reilly, page 59

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MAKING a difference

Prof Receives – As Well as Gives

By BARRY FRIEDMAN
EXPLORER Correspondent

J. Fred Read, professor of geology at Virginia Tech University and a recipient of this year's AAPG Grover E. Murray Distinguished Educator Award, has an admission to make.

An apology of sorts.

"Looking back, I realize I tended to underestimate just how good my graduate students really were."

One hopes his former students are reading, those men and women who have gone on to professions in academia and industry, for Read holds them in higher esteem than he might

have told them.

Further, these are students who have remained cherished friends and colleagues, Read says, and of whom "I value above all else.

"The nice thing for me about teaching is that it is a two-way street," said Read, who talks of accepting the Murray award as a tribute to all those great graduate students he's had.

"Students have taught me probably a lot more than I have given them."

The Source of His Passion

Every geology professor has such



Read

dig into the literature and provide me with a crash course in the topics at hand, along with a first look at new developments that they uncover as the

sentiments; Read says, for him, he knows why. And it has to do with the excitement and interest that students bring to the work, and how their approach renews his passion.

"Once started on their research projects, the students

projects evolve," he said.

He is talking specifically about his proximity the last 35 years to the students' work in sequence stratigraphy, cyclostratigraphy, modeling, geochemistry, diagenesis of carbonate cements and dolomites, and carbonate reservoirs in units ranging from the Early Proterozoic to the Miocene, and as far afield as Arctic Canada, the Appalachians, the Great Basin to Hungary, Croatia and Saudi Arabia.

Read believes he learns something every time he's a part of the process, no matter where he is in the academic landscape.

"I have also enjoyed teaching at the undergraduate level, especially the Evolution of the Earth and Life (a course designed for freshmen) and sedimentology-stratigraphy," he said.

"For many students, the fossil record is a real eye opener and it greatly broadens their understanding of evolution – even for those who come into the course with preconceived notions."

Debunking their preconceived notions, he said, is tempting, but he shies away from leveling his students so soon in the process.

"I have never tried to be confrontational on this, but let the fossil record speak for itself," he said, "which it does eloquently."

Summer Magic

Read has been teaching, researching and working in the geosciences long enough to know that the changes in the industry, while seemingly spectacular, are similar to those in any field.

"Although the oil industry has a reputation of being cyclic, the same is true for academia," he said, bemoaning budget cuts as one example where life inside the university can be as difficult as life in the field.

Further, he has had to change his methods through the years, because students, like the profession and like the university, haven't stayed static in his three-and-a-half decades.

"My approach to teaching has changed over the years from blackboard to overheads to PowerPoints, but now I tend to use a mix of all three, along with readings and discussions of critical papers, and an emphasis on lab and field work to hammer home the points," he said. "I am a great believer in having the students get out into the field and measure detailed sections, or have them tackle real data sets in the lab to come up with a coherent story."

Since Read teaches at Virginia Tech, a state institution, he is expected to devote roughly equal time to teaching and research during the academic year – along with a service component.

Students, then, aren't the only ones in the classroom looking forward to summers and the free time that comes with it.

"I have always kept summers open for research and field work."

And part of that work involves a project that studies the use of carbonate platforms through time to better constrain the Phanerozoic record of global climate change.

"Antun Husinec and I have a project funded by NSF on the Croatian carbonate platform of Mesozoic age, which provides a superb cyclic record of sea level changes, tectonics – and

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[continued on next page](#)

Top Teams Set for IBA

Final Competition Held in Denver

By MIKE MLYNEK
AAPG Student Focus

The finalists are set for this year's Imperial Barrel Awards competition, and 10 student teams from around the world are getting ready for the IBA finals.

This year's IBA will be held June 5 in Denver – one day before the official start of this year's AAPG Annual Convention and Exhibition.

AAPG's IBA Program is an annual prospect/exploration evaluation competition between university student teams who use real data, with the top team winning \$20,000 for their petroleum geoscience departments.

The finalists were all determined by local and regional competitions, which this year attracted 88 teams from around the world.

The thus-far spirited competition already has produced several surprises. It's already known, for example, that this year's winner will be a first-time champion;

The schools who will compete in Denver are:

- ✓ Eastern Section – University of South Carolina.
- ✓ Gulf Coast Section – Texas A&M University.
- ✓ Mid-Continent Section – University of Nebraska.
- ✓ Southwest Section – University of Texas-El Paso.
- ✓ Rocky Mountain Section – University of Colorado.
- ✓ Pacific Section – San Diego State University.
- ✓ Canadian Region – Memorial University.
- ✓ European Region – Moscow State University.
- ✓ African Region – Obafemi Awolowo University (Nigeria).
- ✓ Asia/Pacific Region – Khon Kaen University (Thailand).

continued from previous page

climate," he said. "We are also working with Aramco, through Aus Al-Tawil and Duffy Russell and many others on refining the sequence stratigraphic framework of the Mesozoic reservoirs in Saudi Arabia – our lab at Virginia Tech has been renamed Al-Carbonate Lab by my Arab students.

"Both of these Mesozoic projects have been real learning experiences," he added, "given that much of our work has been on Cambrian to Triassic carbonates, and Cenozoic age units."

He Knew When ...

Like many geologists, especially those who both teach and do the work in the field, Read talks about the intangibles and mysteries of the profession.

"Geology has been and continues to be great fun, much like a detective story, with bits and pieces that need pulling together to make a coherent story," he said.

"I have been lucky to have stumbled on a life-long job that has always been fun, even when we have been covered with mosquitoes, or baking in the heat."

There is something else, too, and it came upon him when he was studying geology as an elective while majoring in chemistry at the University of Western Australia.

It was after his first geology field trip that he thought:

"They will actually pay people to do this. What a great job." □

The popular IBA program depends on corporate sponsorship to help meet its goals – and opportunities still exist for companies that want to be part of the program.

In fact, only sponsoring companies are able to view these top teams from across the globe as they compete in the competition.

For more information regarding Region and Section competitions or on IBA sponsorship opportunities go to www.aapg.org/iba; or contact Mike Mlynek (mikem@AAPG.org) or IBA Sponsorship chair Erik Mason (Erik.Mason@shell.com).

Reilly

from page 56

astronauts on that for generations," he said.

Cold Hard Facts

Reilly served in the NASA astronaut office for 13 years, working with three others who also previously worked in the oil industry. These former oil industry professionals recognized the need for more seismic data and began talking about it some three to four years ago, he said.

"We piggybacked on some other projects. They had been testing some new space suits," he said, "so first we set some geophones out and did some tests at Johnson Space Center."

Later they tested the system at the Meteor Crater in Arizona.

"We were able to look at the geology near the crater, which would be similar to what we'd see in the moon and Mars," Reilly said. "We repeated that test for three years."

In the third year a team member wearing a space suit ran the thumper as a remote source from the prototype.

"We were trying to get information on how we could do this as a robotics system and a human system," Reilly said.

A member of the team tested the geophones in Antarctica's dry valleys a few years ago.

"Mars is a very dry place but it has the possibility of ice in the subsurface, Reilly said. "That was a good test bed to see whether the system is operative." □

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Networking in Denver

Young Professionals Raise Their Profile

By NATASHA RIGG
HECTOR CASILLAS
and SONYA PUNCH

AAPG's Young Professional Committee, revitalized in a burst of creative energy last September, is planning to have a major presence in Denver at the AAPG Annual Convention and Exhibition.

The highlight will be the "Student-Professional Meet-N-Greet" in Denver Sunday, June 7 – a chance for those attending to "jump-start" their convention experience with the first steps of networking.



Rigg

And for those who missed the sign-up deadline for the event: That's OK. Just show up at 3:30 p.m. outside of the Four Seasons Ballroom (where the opening session will be held) and we'll do our best to match students with working professionals for the

duration of the opening session and Icebreaker.

The YP Committee also will be co-hosting the AAPG Student and Young Professional Hub, a kiosk that will be located near the student lounge where students and young professionals can:

- ✓ Meet and network with established geoscience professionals.
- ✓ Find out what AAPG has to offer them – both in Denver, and in terms of furthering their career.
- ✓ Attain information on sponsored dues, the Student Chapter Program, the Visiting Geoscientist Program, the Imperial Barrel Award and Student Expo events.
- ✓ Discover how you can become active and engaged in AAPG Divisions – energy minerals (EMD), environmental geosciences (DEG) and professionalism (DPA).

Check out the YP and Denver pages at www.aapg.org for details.

Get Involved!

On behalf of the committee we would like to extend a personal invitation to all recent graduates and early career geoscientists to renew their AAPG membership, join us and keep in touch with the ongoing YP-Network events.

The Young Professionals Committee is a group of geoscientists from all industries and academia with a simple mission to:

"Foster a challenging and successful career in the energy business for recent college graduates and early career geoscientists, and build an understanding of the value of a lasting relationship between AAPG and young professional members."

AAPG can offer you a lifetime venue for networking, learning and mentorship on local and international levels. In the midst of challenging times such as these, your network is a powerful tool that can help you navigate your professional career.

To assist, we are creating subcommittees in different local, regional and international communities so that you can stay connected.

Are you interested in helping out? Contact us!

We promise events throughout the year that will keep you in touch with old friends, and help you meet new ones.

We invite you to stay up-to-date on information about our committees and events via:

- ✓ Our Web site, at www.aapg.org/youngpros/.
- ✓ LinkedIn Group – "AAPG Young Professionals."
- ✓ Facebook Group – "AAPG Young Professionals."

The industry realizes that we are the continued driver for its success. So join us and expand your networking realm!

continued on next page

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REGIONS§ions

Industry Support Adds Value to IBA Program

(Editor's note: Regions and Sections is a regular column in the EXPLORER offering news for and about AAPG's six international Regions and six domestic Sections. Contact: Carol McGowen, AAPG's Regions and Sections manager, at 1-918-560-9403; or e-mail to cmcgowen@aapg.org.)

By CAROL MCGOWEN
Regions and Sections Manager

From its beginning in 2007, industry leaders recognized the value of the AAPG Imperial Barrel Award Program and generously supported its intent with their financial sponsorship (see related story, page 59).

Now in its third year, industry sponsorships of IBA support a program that this year expanded to include students from 88 universities worldwide.

IBA's educational and career development features come from the data analysis and prospect presentation exercise, in the form of feedback from industry judges and networking with potential future employers. The program simulates a real-world industry-working environment (i.e. limited data, short study period and an even shorter presentation time).

This year corporate leaders are supporting and helping to increase the program value with more than their money:

✓ IBA's educational value is multiplied many times over by industry mentors who adopt a participating university, giving of their time and skills to coach a team in the finer points of presentation skills. Industry mentors give feedback and serve as a mirror to help improve a team's presentation skills to motivate a deeper level of critical thinking – and to shape a young professional.

✓ Schlumberger Petrel and Halliburton Landmark Geographic generously agreed to donate software to participating IBA teams worldwide. The multiplying effect of this generous deed cannot be overemphasized. Schlumberger donated Petrel 2009 software licenses to nine Africa Region schools and provided free training!

✓ Nigerian-based Fixital donated use of its conference and computer facilities for the Petrel training and added two training instructors.

✓ Bob Stewart, global geoscience recruiting supervisor with ExxonMobil Exploration will offer a short course on Saturday, June 6, following the IBA global finals competition. The course is designed for university faculty advisors to better prepare future teams for the IBA competition. (Stewart's class is limited to 40 participants.)

By the time IBA finals occur, 435 students from 87 universities in 23 countries will be exceedingly more marketable to potential employers. And when professors use IBA as a lab exercise, semester capstone project, or

demonstration project of and entire course, the range of IBA impact grows exponentially.

The 2009 IBA Committee, chaired by Connie Mongold, wishes to express "sincere thanks to the IBA Section and Region coordinators, judges, sponsors, faculty advisors and of course students for your commitment to the energy industry and growing its future work force."

A complete listing of IBA sponsors worldwide will be published in the July EXPLORER. □



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Dr. Muki Mukhopadhyay, President, Global Geoenergy Research Limited of Canada, a World Expert On Heat Flow, Maturation, and Source Rock Geochemistry For Conventional (deepwater) and Unconventional (Shale Gas and Coalbed Methane: defining adsorbed and free gas) Petroleum Resources

Join us at the Post-Convention AAPG Short Course (by Muki & Hantschel) in Denver on June 11th and Learn about Heat Flow, vitrinite reflectance and other, maturation Parameters and 1D/2D/3D PS Modelling

Contact Information

Global Geoenergy Research Limited
1657 Barrington Street, Suite 427 (P.O. Box 9469, Station A, B3J 5S3)
Halifax, Nova Scotia, Canada B3J 2A1; Tel: 902-453-0061; 902-401-0061
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*Patent pending

continued from previous page

We're looking forward to meeting you at the annual convention in Denver. □

(Editor's note: Rigg is chair and Casillas and Punch are members of the AAPG Young Professionals Committee. Rigg is with Anadarko Petroleum, Boulder, Colo.; Casillas is with Anadarko Petroleum, Houston; and Punch is with Shell International E&P, Houston.)

Attention Deepwater Explorers

Global Turbidite Field & Reservoir Database

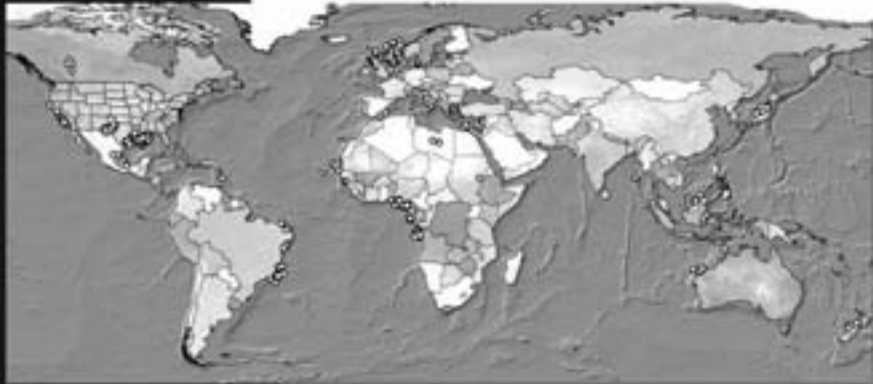
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FOUNDATIONupdate

The AAPG Foundation will have an active presence in Denver for the AAPG Annual Convention and Exhibition, including these events:

✓ Members of the Corporation and Board of Trustees will meet Monday, June 8, immediately following the All-Convention Luncheon (which will feature a talk by the recipient of this year's Weeks Medal recipient T. Boone Pickens).

✓ Campaign co-chairman and team leaders will meet at 8 a.m. on Tuesday, June 9.

✓ Chairmen Lee Backsen and William Fisher will host the annual Chairmen's Reception on Tuesday evening for Trustee Associates, spouses and guests.

Of course, the Foundation will have its usual special area in the AAPG Center where all are welcome to stop by with questions about Foundation activities – or just for a visit. We're looking forward to seeing you in Denver.

* * *

Foundation (General)

Thomas and Jan Barrow

In memory of Richard Storm

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Howard Ross Cramer

Timothy Diggs

Paul H. Dudley Jr.

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TOTY: His State Is His Inspiration

By KEN MILAM
EXPLORER Correspondent

Ty Robinson may keep his students down to earth, but recently he sounded like he was walking on air.

The reason for the elation: He had been named AAPG's Earth Science Teacher of the Year.



Robinson

Granted, the Provo (Utah) High School teacher has collected several honors in his 22 years as an educator, but "this is the best one I ever had," he said.

Colleagues who nominated Robinson for the award cited his dedication, originality and enthusiasm.

Robinson in turn cited his fabulous state as part of the reason.

Geologically, "Utah is a fantastic place," he said, with spectacular displays of the earth's mechanisms visible at almost every turn.

"It's a crime *not* to go into the field when you live in a state like Utah," he said.

And to back it up, Robinson takes students on 30-plus field trips each year.

"Next month we're going to trench a fault in a farmer's field," he said, "to measure how faults move.

"We do mass wasting studies ... strike and dip," he added. "It's not high tech, but I like to have class time applied in the field. Geology is a lot of things."

For example, one regular field trip is to a U.S. Synthetic plant, which produces diamonds from diamond dust for drill bits and other uses.

Support for Science

Robinson believes the state's education system is strong in the sciences.

"The state requires earth systems to be taught at the freshman level ... and at least 10 high schools have geology classes," he said.

As a past president of the Utah Science Teachers Association, Robinson is proud of the state's support for science; state law mandates "evolution is to be taught in the Utah education system," he said.

"There's quite a bit of support in Utah," he said. "We teach science, and that's the way it goes. We teach based on scientific evidence – evolution is backed by the best evidence, which I'm glad about," he said.

When "a few state senators tried to sneak intelligent design" into the curriculum, "we beat it – we fought it,"

Robinson said.

"We have a very strong teachers association – we're very lucky in that aspect," he said.

Growing the Next Generation

Robinson's stated goal is to teach so that "students can really enjoy learning.

"Science is all around us," he likes to say. "I want to show them how to reason and use the scientific process ... (as) it applies to real life."

His own favorite? "I love carbonate rocks like crazy," he said.

A highlight is using stratigraphy to teach students "to use logic to date the age of the earth."

Robinson said about 10 of his former students have gone on to pursue degrees and/or careers in science fields.

One female graduate is in the field of environmental geology through the Bureau of Land management, he said. Another, a sophomore at Brigham Young University, is majoring in seismology and a third plans to enter oil exploration after completing a church mission.

Robinson's enthusiasm and talents for teaching impress colleagues as well as students.

Fellow science teacher Ryan Rasmussen, who has worked with Robinson for the eight years Robinson has been at Provo High, said of him, "I do not know a teacher who works harder and longer than Ty. He is constantly working one-on-one with students involving them in a variety of research projects."

Robinson volunteers for various science fair duties and has developed computer-based lessons and graphics that he has shared with other teachers, Rasmussen added.

"Ty helps students see that science research is just as viable a means of getting scholarships to major universities as athletics or any other extra curricular activity," Rasmussen said.

Robinson's principal, Samuel L. Ray, also wrote in support of Robinson's nomination, partly because Robinson has initiated several popular science programs and classes.

Ray cited Concurrent Enrollment Geology, a class emphasizing field studies that allows students to receive credit for the class at Utah Valley University.

"Many of his students have presented their research at professional research symposiums," Ray said, "and have received top awards and scholarships at international science fairs." □

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- Applications for 3-D Seismic: Structure, Stratigraphy, & Fracture Identification
- Horizontal Plays in the Mid-Continent: Geologic Opportunities, Drilling and Completion Techniques
- Fractures & Microfractures: Importance to Resource Plays
- Professional Development for Geoscientists: New Hires to Old Hands, Concepts to Completions
- Mid-Continent Petroleum Systems
- Unconventional Technology in Mature Fields
- Shale and Coalbed Reservoirs in the Mid-Continent
- New Oil and Gas Ventures: Dare-Dream-Do
- Geology of the Mid-Continent

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MEMBERSHIP & certification

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

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

Information included here comes from the AAPG membership department.

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

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

For Active Membership

California

Neher, Kurt Edward, Occidental Oil & Gas, Tupman (L.C. Knauer, S.A. Reid, J.G. Kuespert)

Colorado

Jackson, Benjamin Peter, Credo Petroleum, Denver (P.D. Hess, T.A. Vandeven, D. Sondergaard); Morgan, Paul, Colorado Geological Survey, Denver (reinstatement); Phan, Thuan, Schlumberger, Denver (C.M. Laudon, C. Stahn, G.J. Stefaniak)

Maryland

Hinnov, Linda A., Johns Hopkins University, Baltimore (C. Huang, P. Weimer, A.W. Droxler)

Ohio

Shumway, Martin Richard, MacKenzie Land and Exploration, Worthington (P. MacKenzie, S.P. Zody, J.C. Olds)

Oklahoma

Abouelresh, Mohamed Omar, University of

Oklahoma, Norman (R.M. Slatt, J.D. Pigott, C. Santacruz); Funk, C. Craig, Ryan Petroleum, Oklahoma City (T. Budden, T. Hopps, E. Randolph); Hull, John Trenholm, Anadarko, Oklahoma City (J.M. Forgotson, D.K. Johnson, R.M. Slatt)

Oregon

Erfurt, Anja, RWE and NW Natural, Beaverton (H.J. Meyer, J.A. Thum, M. Klafki)

Texas

Chirico, John P., Weatherford, Midland (J.M. Party, T.F. Gawloski, R.G. Reyes); Covarrubias,

[continued on next page](#)

Certification

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

Petroleum Geologist

Colorado

Donald J. McKenna, Wexford Resources, Denver (reinstatement)

Texas

John E. McCarty, consultant, Midland (J.M. Party, J.A. Schwab, G.D. Hinterlong); Ian A. Thomas, Marathon Oil, Houston (M.C. Barnes, R.W. Nordquist, J. Chen); Francis V. Yakubanski, Weatherford, Midland (J.M. Party, P. Lufholm, S.L. Shaw)

Petroleum Geophysicist

Kansas

Susan E. Nissen, consultant, McLouth (E. Morrison, M.K. Dubois, D.E. Hedke)



UPCOMING REGIONAL WORKSHOPS

6/15-20 **Rocky Mountain:** Futures in Energy Student Training/Internship - Golden, CO. Contact: 303-273-3107

Water/Gas Shutoff and Conformance Control—Knowing What To Do/Where

6/30 **Midcontinent** - Tulsa, OK. Contact: 918-241-5801

7/2 **Rocky Mountain** - Casper, WY. Contact: 303-273-3107

Applied Reservoir Geology for Engineers

7/9 **Texas/SE New Mexico** - Houston, TX. Contact: 512-471-0320

7/21 **Central/Eastern Gulf** - Lafayette, LA. Contact: 225-578-4538

7/28 **Eastern** - Pittsburgh, PA. Contact: 304-293-2867 x5443

7/8 **Rocky Mountain:** Petra Basics - Golden, CO. Contact: 303-273-3107

7/23 **AAPG e-Symposium:** 2 pm - 3D Seismic Profiles of U.S. Shale Plays
<http://blog.aapg.org/learn/?p=169>

7/28 **West Coast:** Introduction to Petroleum Geology - Sacramento, CA.
Contact: 661-635-0557

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

'Full Service' Is Our Name

By VICKI BEIGHLE

AAPG Membership Manager

If you're attending the AAPG Annual Convention and Exhibition in Denver we KNOW you'll have a lot of activities to keep you busy.

But one thing that you should add to your schedule is a visit to the AAPG Center, located in the exhibition hall.

This year our theme is "full service" – as in, what we provide for our members – and the Center's unique 1950s retro motif is reason enough for a visit.

For every \$50 spent at the Bookstore or General Store you'll receive one chance to win prizes in daily drawings.

But that's not all. Once there you can:

- ✓ Pick up your convention abstract CD.
- ✓ Pay your 2009-10 dues.
- ✓ Get information on all member

benefits – including the AAPG Career Center.

✓ Pick up your Active member recognition ribbon.

✓ Check out the latest AAPG education offerings.

✓ Get information on future/upcoming meetings.

✓ Check out PTTC.

✓ Learn what your Section/Region is doing – both in Denver *and* back home.

✓ Visit the GeoCare booth (AAPG insurance provider for our members).

✓ Learn about the AAPG Foundation and its many activities.

✓ Check out the latest digital products from DataPages.

✓ Join one of the Divisions, and/or learn about their membership offerings.

✓ Visit the Student Lounge.

✓ Learn about AAPG's programs for students.

continued from previous page

Edgardo, J.M. Huber Corp., Houston (A.R. Attaway, K.C. Wise, R. Kaczorowski); Dell'Angelo, Lisa Nicole, GeoMechanics International, Houston (R.J. Hill, L.L. Summa, G.P. Eberli); Hasanov, Eldar Tofiq oglu, Reservoir Knowledge, Houston (H.M. Proctor, N. Henry, S. Barrett); Marin, Barbara, Schlumberger, Houston (M. Milner, S.R. Bereskin, M.S. Cameron); Miller, Mark T., Halliburton, Houston (D.J. Quinn, K.D. Stewart, K.T. Lewallen)

Virginia

Whitmeyer, Steven J., James Madison University, Harrisonburg (J.T. Haynes, S.A. Leslie, R.D. Hatcher)

Washington

Sha, Grant Steven, Halliburton Energy

Services, Pullman (J.P. Elliott, T. Perkins, L.W. Evans)

Wyoming

Otteman, Aaron Shane, Wold Oil Properties, Casper (J.R. Steidtmann, R.S. Martinsen, S. Mazzoni)

Angola

Siddiqi, Hissam M., Sonangol Pesquisa & Producao (P&P), Luanda (reinstate)

Austria

Aguilera, Roberto Federico, IIASA (International Institute for Applied Systems Analysis), Laxenburg (R. Aguilera, F.F. Krause, J. Tilton)

See [Membership](#), page 69







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READERS' forum

Wyoming's Contribution

I take exception to the statement in the article, "Colorado 'Hot Rocks' Enticing" (May EXPLORER), wherein it was stated: "No one has developed anything like that in the United States yet, mainly because they've been looking in crystalline rocks versus sedimentary rocks, so far."

Here at Teapot Dome in east-central Wyoming we have been generating electricity for eight months using a binary geothermal power plant, extracting the heat energy from oilfield produced water from sedimentary rocks.

The Pennsylvanian/Permian Tensleep Sandstone at 5,500 feet depth in our field produces about 40,000 BWPD at 200 degrees F. Our thermal gradient is 55 degrees C/km – very comparable to the Raton Basin data shown in your article.

We believe this proof-of-concept project has effectively shown the widespread potential to utilize oilfield produced waste water for beneficial-use geothermal power generation, enabling some old stripper fields to extend their life substantially.

Our demonstration project was mentioned in the August 2007 EXPLORER and also was featured in the April 2009 RMAG Outcrop – and our staff has made presentations about this facility at several geothermal conferences over the past two-three years.

Tom Anderson
Casper, Wyo.

(Editor's note: Anderson is chief scientist of the Rocky Mountain Oilfield Testing Center.)

Editor's note: Letters to the editor should include your name and address and should be mailed to Readers' Forum, c/o AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101, or fax (918) 560-2636; or e-mail to forum@aapg.org. Letters may be edited or held due to space restrictions.

Salary Survey Questions

I would like to comment on the annual AAPG salary survey.

First, I would really like to know where these figures are coming from. I live in West Virginia, and the normal entry level geologist job entering the work force is estimated around \$35,000-\$38,000 a year. I would be curious to see where this survey has taken place, and how it would compare to those salaries of the same experienced people in the Appalachian Basin.

I assume these figures are based on oil and gas geologist and not coal geologists, who probably make much less.

Tim McGrady
Griffithsville, W.Va.

(Editor's note: This year's salary survey results can be found on page 6. The accompanying article provides some information on the survey's scope and intent.)

GEO-DC Town Halls

Regarding the May Washington Watch column: Kudos to Mike Party for arranging this event (a town hall meeting in Midland, Texas, sponsored by the Division of Professional Affairs), which gave our members an opportunity to hear from GEO-DC director David Curtiss, whose management of GEO-DC is bringing lots of favorable recognition to

the Association.

Similar town hall meetings will be a priority in our quest to integrate our members into the GEO-DC mission of bringing science, technology and education to policy makers.

Patrick J.F. Gratton
Dallas

Whistling Past The Graveyard

Can you feel the fear of future crude oil shortages creeping back into the markets? I can.

Or maybe it's just those corrupt, dastardly major oil companies and scheming vile traders manipulating those crude prices again. It just couldn't possibly be true, that the global recession (brought on by real crooks inside and outside of government) masked the emerging 2008 peak oil plateau, and that any future, significant crude oil demand increases (think BRIC) will push crude prices way past where they were in 2008.

Could it possibly be true, that the continued steep decline of the old, super-giant oil fields around the world (check out Mexico's Cantarell Field), combined with all the usual suspects – dictators like Hugo Chavez, limited access to National Oil Company acreage, a completely naive, dangerously anti-oil crowd, the super-fantasy of green alternatives actually providing for and running the world's automobiles, trucks, trains, planes and

ships, etc. – will put the world in real jeopardy per adequate crude supplies?

Crude oil is different from natural gas. The two commodities are just not connected anymore. One is global, difficult and expensive to find and produce. The other is regional, abundant and readily available.

Look for \$300+/bbl oil by 2015 – maybe sooner.

Bradford R. Schmalfuss
Houston

Metrics, Etc.

Further to the comment concerning grammar in the February Readers' Forum, something that your editor and writers should avoid is the use of et cetera and etc. Both of these items are meaningless and indicate that the writer does not know what else to write or does not want to make a complete list.

If the writer does not know or care to continue, how can the reader be expected to complete the listing?

Often et cetera and etc. are preceded by the words "such as" and "for example" – both terms indicating a complete list will not follow and thus making et cetera and etc. unnecessary.

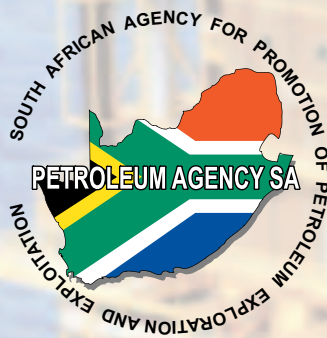
Also in the February Readers' Forum, the writer is right on track in saying the AAPG should adopt the metric, or international system, for units of volume.

AAPG could be a pioneer in helping Americans switch to the metric system of measurements. We cannot stay as being unique in terms of measurements and yet call ourselves an international organization.

Sidney Rieb
Chiang Mai, Thailand

REPUBLIC OF SOUTH AFRICA 2009 OFFSHORE LICENCE ROUND

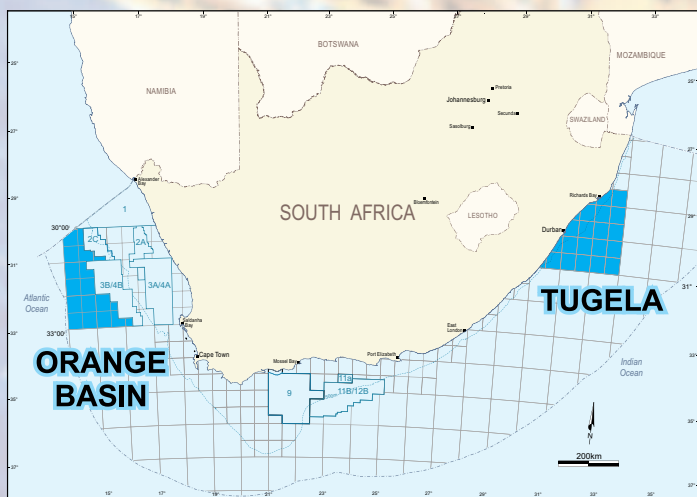
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For further information on the Licence Round and terms see our website:

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Visit the Agency exhibition Booth at the AAPG in Denver no: #IP2146

wwwUpdate

Addressing Web Matters Directly

By JANET BRISTER
AAPG Web Site Editor

Where do you live? Where do you work? Where do you want to eat? What do all of these places have in common? Addresses.

On the earth AAPG is located at Lat 36:8:29.745 N and Lon. 95:59:18.719 W. Geocoders and map readers would have no difficulty finding it.

Let's say you wanted to ship a package to AAPG; send it to 1444 S. Boulder Ave. in Tulsa, Okla., for the street address, or P.O. Box 979 for the postal address.

All of these addresses point to the same location – and I can even point you to my department or my office at that location: My office is on the fourth floor in the communications department. My subdomain, if you will, is AAPG Communications.

AAPG's domain name (address) is aapg.org, and there are several subdomains (departments/floors) within it.

Knowing a little bit about the AAPG subdomains may help you quickly navigate to certain areas of our Web site, bypassing the AAPG home page and eliminating one more click.

The subdomains served up at AAPG include the Divisions, student membership, the Bookstore and AAPG's Foundation.

Science details such as the online BULLETIN and its archives and Search and Discovery are separate domains from aapg.org.

And This Matters ... Why?

The content of each of our subdomains is focused to that area's information and data.

✓ AAPG Foundation members simply go to foundation.aapg.org to make a contribution, read about the different ways they can designate those contributions, learn what programs the AAPGF supports and the latest news and updates on the Foundation's activities.

✓ The Divisions each have their sites. To get there you simply put that division's initials before the aapg.org domain. For example, emd.aapg.org takes you to the Energy Mineral Division's Web site, where you can read about the different commodities that EMD follows or other member information. EMD members have exclusive access to their newsletters, annual reports and more in-depth information on the commodities.

At dpa.aapg.org you can find the AAPG statements on world-impact issues as well as the testimonies that members of AAPG have brought to U.S. government. The Division of Professional Affairs posts the current issue of its newsletter *The Correlator* for the public to read while archival copies are available only to their membership.

Also, through their site DPA members may follow legislative action on both the state and federal level.

The Division of Environmental Geosciences is preparing to expand deg.aapg.org. Details about DEG activities and access to its science journal, *Environmental Geoscience*, originate here.

✓ Through bookstore.aapg.org members not only purchase books and publications of the AAPG but they register for courses, field seminars and workshops. Maps and digital publications also are available.

✓ The students.aapg.org subdomain is focused on all things related to the

See [wwwUpdate](#), page 68

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THE PETROLEUM INSTITUTE ABU DHABI, UNITED ARAB EMIRATES

Institution: The Petroleum Institute (PI) in Abu Dhabi, United Arab Emirates was created in 2001 with the goal of establishing itself as a recognized institution in education and research in areas of significance to the oil and gas and the broader energy industries. The PI's sponsors include the Abu Dhabi National Oil Company and four major other international oil companies, namely BP, Shell, Jodco, and Total. The Institute is affiliated with and has collaborative programs in place with the Colorado School of Mines, the University of Maryland at College Park, the University of Minnesota, and Leoben and Linz Universities (Austria). For more information, please refer to the PI website: www.pi.ac.ae.

FACULTY POSITIONS - PETROLEUM GEOSCIENCES

The Petroleum Geosciences Department at the PI is seeking applications for the following positions:

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Professor, Associate Professor, Assistant Professor
Research Associate**

Program faculty will be expected to teach undergraduate and graduate courses, develop an active research program, and to engage in professional and institutional service activities. Opportunities to interact with PI industrial stakeholders and other local industries will be a key feature in the development of a research program.

Interested candidates should submit all materials online:

www.pi.ac.ae/jobs

Review of applications will begin immediately and will continue until successful candidates are selected. Only short-listed applicants will be notified.

Inmemory

Clyde A. Brooke Jr., 86
Picayune, Miss., March 21, 2009
Creighton A. Burk (LF '54)
Austin, Texas
Leland B. Culligan, 88
Lafayette, La., March 6, 2009
Richard F. Dyhrman (AC '75)
Puyallup, Wash.
Charles M. Forney, 88
Corpus Christi, Texas
June 1, 2008
Charles F. Hajek, 82
Grand Junction, Colo.
March 17, 2009
Boyd R. Haley, 86
Little Rock, Ark., March 12, 2009
* William B. Heroy Jr., 90
Durham, N.C., Sept. 25, 2005
John H. Howard (EM '62)
Katy, Texas

Charles V. Lee, 85
Fort Collins, Colo., April 22, 2009
Allen B. Scouler, 92
Soldotna, Alaska, Jan. 25, 2009
Saul B. Suslick, 58
Campinas, Brazil, April 11, 2009
Cleveland M. Welsh, 79
Oklahoma City, March 12, 2009

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

wwwUpdate from page 67

student members of AAPG. Grant information and student expo opportunities are listed, as well as information on starting a student chapter and locating chapters of the AAPG.

✓ The newest addition to AAPG subdomains is blog.aapg.org. Currently four blogs are posted here: Learn!; GEO-DC; Student Outlook and Web.

Learn! focuses on education activities and opportunities.

GEO-DC expands the Washington Watch column of the EXPLORER and addresses issues in the U.S. capitol.

Student Outlook replaces the newsletter of the same name that was written quarterly to the student members

of AAPG. Now announcements and conversations start there.

Last, but certainly not least, Web is where we expand on the information in this **wwwUpdate** column.

Blogs are a great place to offer feedback and make requests. Currently on blog.aapg.org/Web we are discussing social networking tools and how they are being used – and how they might matter to AAPG.

Also, all of these sites are just a click away on the pull down menu on the home page.

All of these subdomains are searched any time you use the Google search tool on the AAPG home page.

Better yet, once you find it just bookmark it. Either way, you'll find what you need quickly.

Good browsing! ☐

Imperial College London

Department of Earth Science and Engineering



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ENERGY & GEOSCIENCE INSTITUTE

The EGI Chair in Petroleum Geoscience

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Applications are invited from outstanding individuals for a Chair in Petroleum Geoscience at Imperial College London in the Department of Earth Science and Engineering.

A new senior research appointment in petroleum geoscience is offered in the Department of Earth Science and Engineering that is part of the Royal School of Mines and the Faculty of Engineering at Imperial College London, UK. The position is sponsored by the Energy & Geoscience Institute (EGI) at the University of Utah, Salt Lake City, as part of the EGI/IC Research Alliance.

We are seeking an enthusiastic earth scientist/petroleum geoscientist with proven experience in research, preferably with an established publications record. The position could include any branch of the petroleum geoscience, including structural geology, petroleum systems, basin analysis, reservoir sedimentology, sequence stratigraphy, 3D seismic interpretation and/or reservoir characterization/modeling. An established record in developing and managing petroleum industry-funded research projects would be advantageous.

The successful candidate will be the Director of the EGI/IC Research Alliance and based primarily at Imperial College in London. However, the position will involve establishing collaborative research links between EGI and IC, which will include time spent at EGI in Salt Lake City.

The level of the appointment will be subject to qualifications and experience, but will be at the Imperial College London Professor Level (minimum salary £66,150 pa).

Our preferred method of application is online via our website: <http://www3.imperial.ac.uk/employment> (select "Job Search"). Please complete and upload an application form as directed and submit any other relevant supporting documents such as your full CV. Please quote reference number: **EN20090077**.

Alternatively, you may e-mail your application and CV to: Maria Monteiro at m.monteiro@imperial.ac.uk, telephone: +44 (0)20 7594 5498.

Further details of departmental research activities may be found at <http://www3.imperial.ac.uk/earthscienceandengineering>

Informal enquiries may be directed to the Head of the Petroleum Geoscience and Engineering Section at IC, Professor Howard Johnson, email: h.d.johnson@imperial.ac.uk

Closing date: 31 October 2009 or until appointment is filled.

Committed to equality and valuing diversity. We are also an Athena Silver SWAN Award winner and a Stonewall Diversity Champion.

www3.imperial.ac.uk/employment

Membership

from page 65

Brazil

Martins-Neto, Marcelo, Vale E&P, Rio de Janeiro (F.L. Fernandes, S.P. Rostirolla, P.H. Van Der Ven); Fernandes, Flavio Luis, Vale E&P, Niteroi (S.R. Mercio, N.C. Azambuja Filho, S.P. Rostirolla)

Brunei Darussalam

Onyeije, Raphael Uche, BAEC (seconded to BSP), Kuala Belait (A.E. Chukwu, M. Al-Lawati, A. Sylvester VI)

Canada

Allen, David Peter, Alberta Clipper Energy, Calgary (D.R. Taylor, H.A. Wishart, D. Marion); Bull, Dean J., Vigilant Exploration, Calgary (E.T. Beattie, B.A. Cheadle, C.F. Bass)

France

Dauphin, Lena, GDF-SUEZ, Saint-Denis La Plaine (J. Barde, E. du Fornel, M. Violla)

India

Bhattacharya, Hiral Suvra, Oil & Natural Gas Corp., Mehsana (A. Garg, N.K. Handa, A.K. Dey)

Korea

Kang, Il-Mo, Korea National Oil Corp., Anyang Gyeonggi-Do (G.H. Lee, I. Cho, K. Choi)

Kuwait

Abu-Hebail, Hanan Salem, Kuwait Oil Co.,

Ahmadi (S.S. Thakur, G.A. Al-Sahlan, H.B. Al-Qallaf)

New Zealand

Bothwell, Thomas Edward, OMV NZ, Wellington (T.M. Allan, R.M. Constable, C.R. Mills)

Nigeria

Adeniyi, Esther Oluwatoyin, Energy & Mineral Resources Limited, Lagos (A.A. Adesida, E. Enu, V.F. Agbe-Davies)

Oman

Mohammed Ghulam, Uzma Mohiuddin, consultant, Muscat (G.A. Forbes, R.A. Penney, J.F. Aitken)

Pakistan

Malik, Tayyab, LMKR, Islamabad (S. Khairi, M. Nizamuddin, S.U. Siddiqui)

Saudi Arabia

Al-Ramadan, Khalid A., King Fahd University of Petroleum & Minerals, Dhahran (A. M. Afifi, A.M. Al-Beajji, J.W. Tucker); El-Taher, Yehia Ahmed, Halliburton, AL Khobar (T.F. El Azhary, A.N. El-Barkooky, M.H. Metwalli)

Suriname

Poeketi, Nohar Misanto, Staatsolie Maatschappij Suriname N.V., Paramaribo (J.M. Armentrout, P.N. Eisner, G.U. Fong)

United Arab Emirates

Iqbal, Asif, Occidental Petroleum, Abu Dhabi (J.A. Klotz, J. Rush, W.D. Raatz)

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POSITION AVAILABLE

U.S. Geological Survey (USGS) Position Available Research Geologist

The USGS, Central Energy Resources Science Center, is soliciting interest from qualified individuals for a Research Energy Geologist position in Lakewood, Colorado. Successful applicants will have qualifying education and expertise in one or more of the following: stratigraphy, sedimentology, structural geology, or basin evolution. He/she will conduct fundamental geologic research to evaluate and characterize the geologic framework, occurrence, and environmental impacts of geologic energy resources, with emphasis on conventional and unconventional oil and gas, coal, and uranium. Candidates must be able to work as part of a multidisciplinary team of geologists, geochemists, geophysicists, and engineers. Excellent skills in writing and oral presentation of scientific findings are also required.

Applications (resume and application questions) for this vacancy must be received on-line via USAJOBS BEFORE midnight Eastern Time (Washington, D.C. time) on the closing date of this announcement. If you fail to submit a complete on-line resume, you will not be considered for this position. Requests for extensions will not be granted. If applying on-line poses a hardship for you, please speak to someone in the Servicing Personnel Office listed on the announcement PRIOR TO THE CLOSING DATE. Transcripts must also be received by the closing date of the announcement. For assistance and questions contact the Office of Human Resources at 303-236-9586 or hdorsey@usgs.gov.

Effective, June 1, 2009 USAJOBS can be accessed at <http://www.usajobs.opm.gov>. Announcement number is CR-2009-0351. This is a full time permanent position (Research Geologist, GS-1350-12/13) with a salary range of \$72,465-\$112,025 depending upon qualifications. The closing date is June 30, 2009. U.S. Citizenship is required. USGS is an Equal Opportunity Employer.

POSITION WANTED

Seeks Work

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By Dr. Krishna Persad et al

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Ads are at the rate of \$2.90 per word, minimum charge of \$60. And, for an additional \$50, your ad can appear on the classified section on the AAPG web site. Your ad can reach more people than ever before.

Just write out your ad and send it to us. We will call you with the word count and cost. You can then arrange prepayment. Ads received by the first of the month will appear in the subsequent edition.

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ENERGY & GEOSCIENCE INSTITUTE



– RESPONSIBILITIES –

Lead geochemical research programs, relevant to energy and environmental disciplines. The main responsibilities are to develop and obtain funding for petroleum geochemistry research programs and ensure that creative, relevant and practical geochemical work is carried out for these applied energy research projects. This would include managing a modern and well equipped laboratory facility and some staff, as well as developing laboratory and field-based research programs utilizing existing and new equipment to complement analytical and numerical work. Presentations to research sponsors are required, as well as preparing and teaching short courses.

– QUALIFICATIONS –

The successful candidate will require a Ph.D. in Geochemistry or a related discipline. Strong laboratory, analytical and communication skills are essential. A solid publication record is required. Domestic and international travel will be required periodically.

– PREFERENCES –

Industry experience is preferred, but is not essential.

– TO APPLY –

www.hr.utah.edu Job posting #36084

www.egi.utah.edu

Assistant or Associate Professor in Hydrocarbon Geoscience



GEOLOGY & GEOPHYSICS DEPARTMENT AND ENERGY & GEOSCIENCE INSTITUTE, UNIVERSITY OF UTAH



The Geology and Geophysics (GG) Department and the Energy & Geoscience Institute (EGI) at the University of Utah invite applications for a tenure-track faculty position in GG at the Assistant or Associate Professor level. The successful candidate will bring expertise in hydrocarbon energy research and will develop a strong, externally funded and internationally recognized research program involving students and industry. Teaching responsibilities will include development of new undergraduate- and graduate-level courses and integration with existing courses in GG's Petroleum Industry Career Path. The appointee will participate in collaborative efforts between GG and EGI. The GG Department and EGI share thriving research and academic programs in petroleum geology and geophysics and allied areas of the geosciences, including EGI's Corporate Associate program. The position will have offices at both organizations, and communication and leadership skills as well as teamwork experience are important. We also offer state-of-the-art facilities including the new Frederick A. Sutton Building. More information can be found online at www.earth.utah.edu and www.egi.utah.edu.

The area of specialization is open but possibilities include geologic interpretation of geophysical data, new methodologies for subsurface imaging, petrophysics, rock fracture mechanics, reservoir characterization and engineering, multiphase fluid flow, and geostatistical modeling. Multiple opportunities for collaboration and funding exist, including capitalizing on emerging interest in unconventional resources.

Candidates must have a completed Ph.D. at the time of appointment and a strong record of research and publication. Applications are being accepted now, and their review will continue until the position is filled. Applicants should submit an application letter indicating research, teaching and programmatic interests and agenda, curriculum vitae, and names and contact information of three professional references to:

Chairs of the Hydrocarbon Geoscience Search Committee
Geology and Geophysics Dept., University of Utah
115 South 1460 East, FASB 383
Salt Lake City, UT 84112

Complete applications may also be sent in PDF format by email to Kristin.Christensen@utah.edu.

Questions can be addressed to [Cari Johnson \(Cari.Johnson@utah.edu\)](mailto:Cari.Johnson@utah.edu) or [Ray Levey \(RLevey@egi.utah.edu\)](mailto:Ray.Levy@egi.utah.edu).

The University of Utah is an equal opportunity/affirmative action employer, encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees. The University of Utah values candidates who have experience working in settings with students from diverse backgrounds, and possess a strong commitment to improving access to higher education for historically underrepresented students.

www.earth.utah.edu

www.egi.utah.edu

DIRECTOR'Scorner

There Are Good Reasons to be Bullish

By RICK FRITZ

Clarence Darrow once said, "History repeats itself; that is what is wrong with history!"

At the joint GSA-GCAGS meeting in Houston last fall AAPG held the largest job fair in our history of joint meetings with SEG. Over 400 students attended, and all were excited about the myriad of opportunities in our industry. Many companies exhibited at the meeting looking for new employees.

As I dined with some of the students, I was very impressed with the talent and energy of the group. I was very pleased that the work force initiatives by industry, institutions and associations were starting to bear fruit with a group of excellent new graduates.

Of course, it is the promise of good well-paying jobs that is the main driver – nevertheless, I know that the leadership and committees of AAPG have worked hard to promote our profession and ask more students into the industry.

* * *

While some of the students were discussing the competition for jobs, a cold chill of déjà vu went down my spine as I thought about what would happen if there were another downturn the industry experienced several years after I graduated.

In the mid-1980s the huge demand for entry-level geoscientists and engineers dropped precipitously. AAPG's membership had grown to over 45,000, but it fell abruptly with the



Fritz

dropping price of oil.

Then I realized that the situation today is quite different than when I was a rookie geologist with Exxon in the early '80s. There are at least three key factors that are different from the industry downturn in the '80s that promise a good near-term future.

✓ One of the key factors is no matter the current price of the oil and gas there is still a critical future shortage of geoscientists and engineers.

The U.S. Department of Labor estimates that roughly one-half of the technical work force will reach retirement age in the next 10-15 years. Industry projections for the personnel required to complete major projects still show a shortage – especially once the economy recovers.

✓ Economic recovery is second.

One of the primary differences from the bust of the mid-'80s is the growing economies of China and India, along with the economies of developing countries. Already there are signs that these economic engines are recovering – especially in China. This will once again drive demand for oil and gas and related jobs.

✓ The third is the focus on unconventional resources and alternative

energy around the world.

In the United States shale gas is a huge resource whose development causes the employment of thousands of geoscientists and engineers. And unconventional plays are not drivers just in North America, as many companies seek to develop these plays with new technology in the many basins of the world.

Geoscientists also have a role to play in alternative energy and environmental applications such as carbon sequestration.

* * *

Of course, with any positives there are negatives. In the United States the primary negatives are potential changes in tax laws and regulations. A decrease in the depletion allowance or loss of intangible drilling tax credits could significantly reduce the number of wells drilled – especially by independents – and reduce related jobs.

Nevertheless, AAPG is still bullish on the potential of our profession and the future opportunities for students. To that end, we believe it is especially important to support students and young professionals through this downturn.

One of our first steps in this effort was to collect information.

For this, we developed an informal survey through the AAPG Student Chapters faculty advisers and we conducted a formal poll of women in the work place. In addition, we have polled numerous companies concerning their

work force plans. Many of those findings will be revealed and discussed at the AAPG Annual Convention and Exhibition in Denver (see related story, page 52).

The universities indicated most of their students still had job offers but activity was slowing and some students were opting to stay in school longer. Many of the corporations indicated they had slowed down in hiring, but most geoscience jobs were stable with only a few companies experiencing layoffs.

Our next step is to make sure we continue support of young geoscientists through AAPG programs. These programs include leadership training, career support, Grants-in-Aid, travel grants and one of our newest programs – the Imperial Barrel Award (IBA).

As you are reading this column the IBA finals are being held in Denver (see related story, page 59). Ten teams of students from around the world will compete. Their enthusiasm is absolutely contagious, and it is with that enthusiasm that they will in turn teach us and transform our industry with new ideas and hard work.

The future is still great for our profession – and AAPG will do everything possible to support our members in their search for opportunity. □

Step forward, offer perspectives, expertise

Share the Facts About Energy

By REBECCA DODGE
DEG President

In this, my farewell column, I want to thank the people who have made my service as president of the Division of Environmental Geosciences (DEG) so rewarding.

A list of names would be too long, so I will try to cover my bases in categories.

✓ My fellow officers have worked hard to move us forward and expand our membership; those who have agreed to run for office for the coming year also have my gratitude.

✓ Our advisers from across the country, and from the few Regions for whom we have advisers, have given valuable advice and direction.

✓ The Region presidents who are working right now to help DEG find an adviser for every Region will make our Advisory Council even stronger.

✓ Those who have worked to produce the *Environmental Geosciences* journal have produced an outstanding set of issues – thanks to the top-level editors, all of the associate editors and, of course, all who have submitted articles for publication. Keep them coming!

✓ Committee chairs have been responsive, helping to bring DEG sessions and short courses to the



Dodge

upcoming Denver convention and for the New Orleans convention next year. We even have a head start on the Houston convention – we already have four sessions set for 2011.

✓ Finally, many thanks to the AAPG headquarters staff for helping to upgrade our Web site; for keeping us on track and at least close to meeting deadlines; for their support in convention planning; and for the many other ways in which they support our efforts.

* * *

The DEG was established in 1992, when "the House of Delegates of the Association indicated support for the concept that basic environmental issues be addressed from a geological point of view, thereby transferring the profession's understanding of geological, geochemical, geophysical and hydrogeological principles and methodologies to the solutions of environmental problems."

It seems that basic environmental issues are often divorced from scientific reasoning of any kind, at least in the popular media. U.S. President Obama has vowed to bring science into the



an audience. I highly recommend that you read the new April 2009 American Petroleum Institute publication "Energizing America: Facts for Addressing Energy Policy" (<http://www.api.org/aboutoilgas/>).

Share these facts about energy – I spent an entire lecture on this material in my Environmental Science class last week.

* * *

I hope to see many of you in Denver, and I hope that you choose to attend our sessions, which include:

✓ Imagining a Carbon Constrained World: EOR Using Anthropogenic CO₂ and Other Options.

✓ Near-Surface Geophysical Applications for Environmental Solutions, Groundwater and Site Remediation.

✓ Carbon Dioxide Capture and Geologic Sequestration.

✓ Our Energy Forum (held jointly with DPA and EMD).

We also are offering the forum concerning Global Climate Change – Anticipating a Carbon Constrained Future: Implications for the Fossil Fuel Industry (DEG/AAPG/GCCC), and our luncheon speaker will address the Cooperative Aquifer Restoration Project, Fort Peck Indian Reservation – a Multi-Agency Success Story (see related story, page 42). □

forefront of environmental issues, and we need to vigorously step forward and offer our perspectives and our expertise.

We need to gain recognition for the fact that the petroleum industry is investing billions in developing new energy technologies and carbon mitigation technologies, as well as in energy efficiency, advanced technology vehicles and non-hydrocarbon fuels – far more than is being invested by the federal government.

All this at the same time our industry is taxed at a far higher rate than other industries, while our earnings are in line with the average of U.S. manufacturing industries!

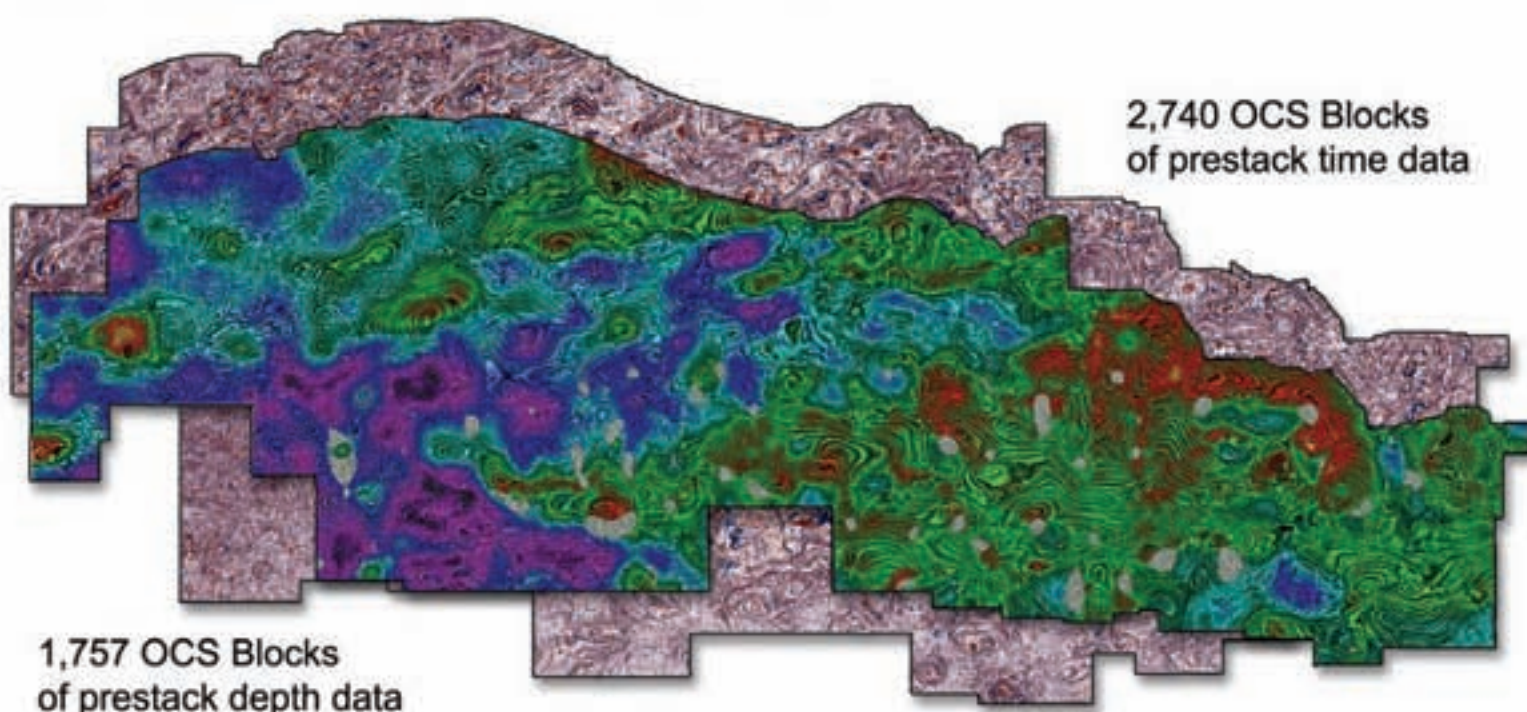
Getting these messages out should be a priority for anyone who has access to

Some risks are unavoidable.



Others are just stupid.

Exploring for hydrocarbons without using the best possible seismic data is an example of the second kind of risk.



**Exploration is a risky business.
Never try it without the best data.**

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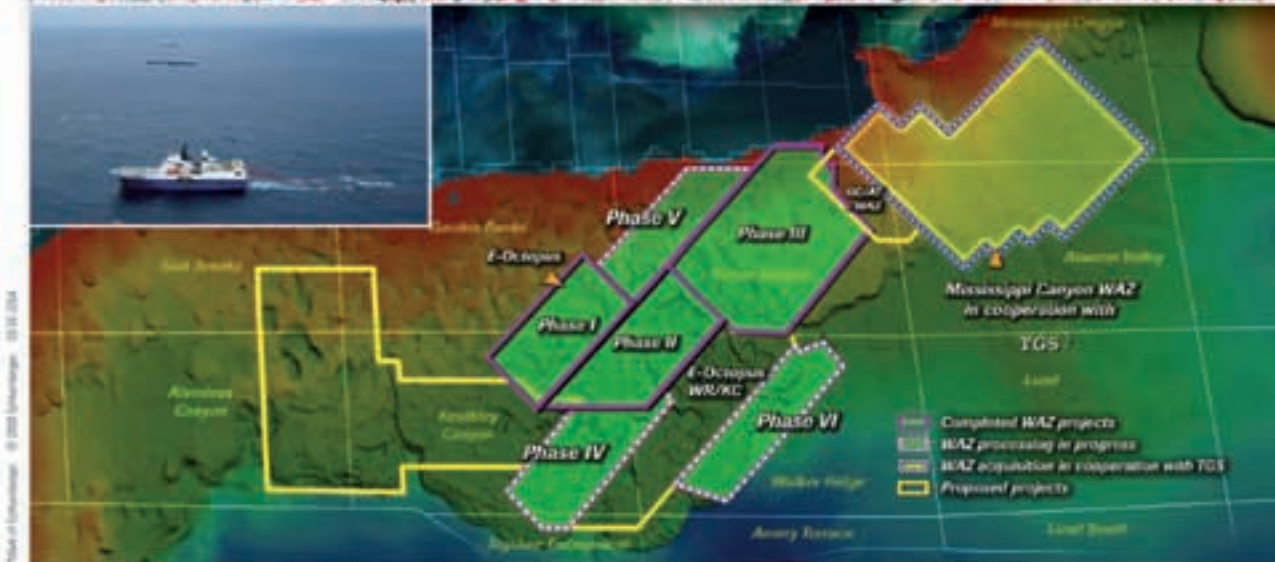
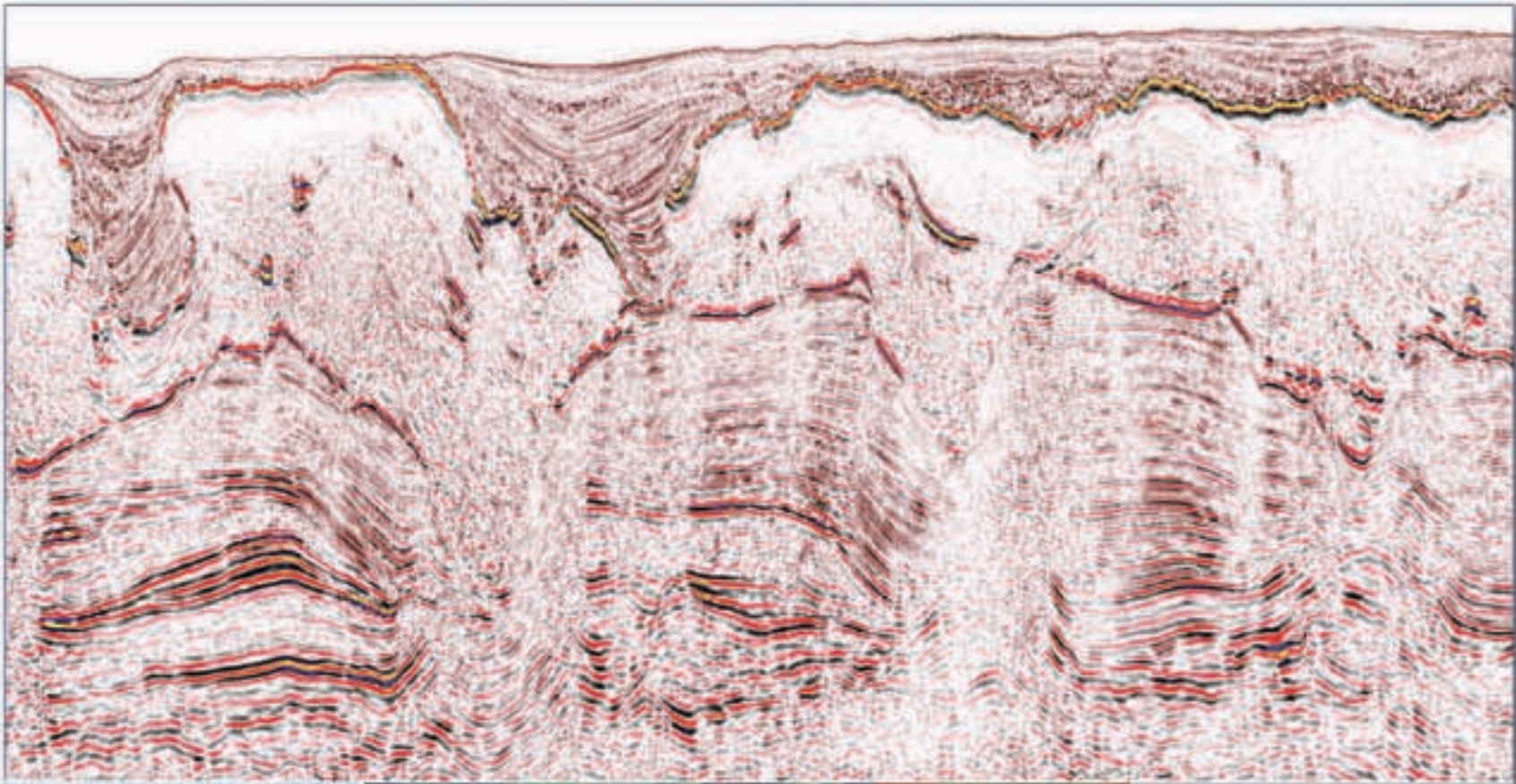
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E-Octopus Wide-Azimuth Survey



WesternGeco E-Octopus wide-azimuth surveys, and our wide-azimuth cooperation with TGS in Mississippi Canyon, utilize industry-leading Q-Marine® technology, survey design, and advanced processing, to provide greatly improved confidence in imaging beneath complex salt formations.

E-Octopus III - Final product available now.

E-Octopus IV - Salt Body 1 available now.

E-Octopus V - Sediment flood available now.

E-Octopus VI - Preliminary fast-track volume available now.

To learn more about wide-azimuth and our new acquisition projects, call +1 713 689 1000.

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