AAPG EXPLORER

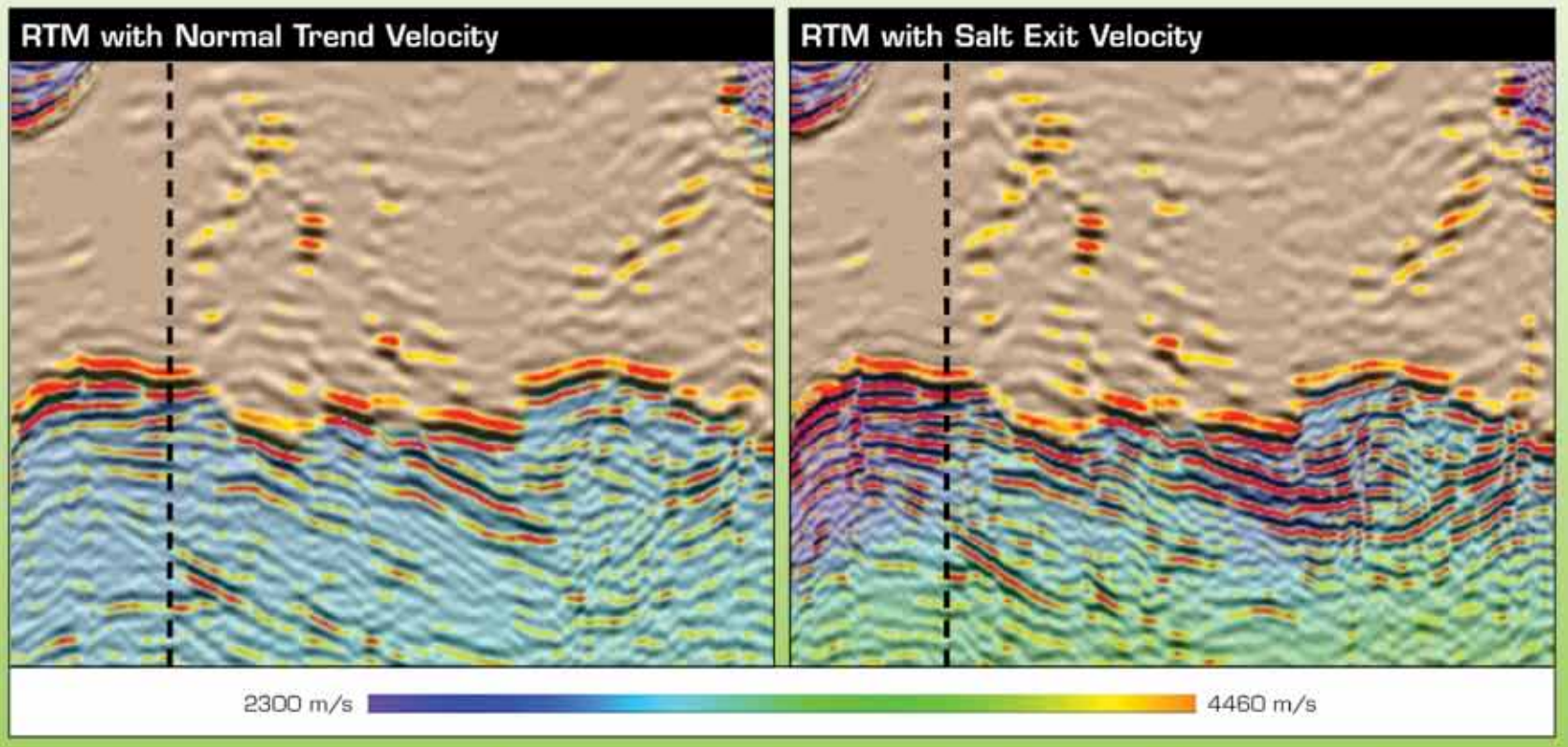
SEPTEMBER 2011

Geology Italian Style

Dramatic Dolomites provide scenic ICE setting

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS AN INTERNATIONAL ORGANIZATION

Safer Drilling with Superior Subsalt Imaging



The benefits of more accurate salt exit velocities are demonstrated clearly on these Gulf of Mexico Green Canyon WAZ results presented by Li et al, EAGE 2011. The salt exit velocity was measured to be within 4% of the actual velocity at well location (black line). Data courtesy of CGGVeritas data library.

Vol. 32, No. 9
SEPTEMBER 2011

AAPG EXPLORER

PRESIDENT'S COLUMN

A Column for You(th)

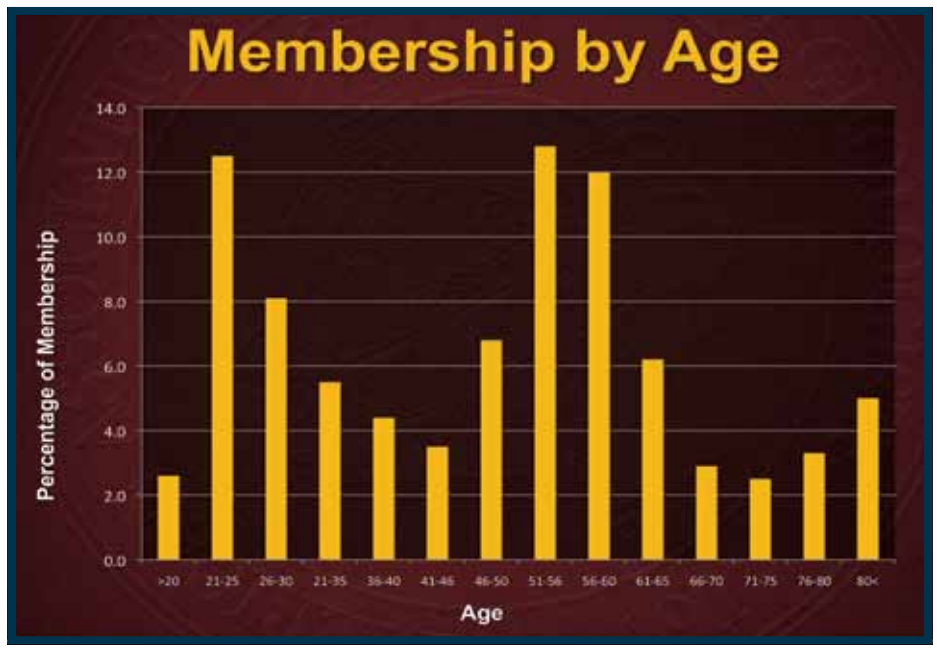
By PAUL WEIMER

This month's column is written specifically for the Student and young professional members of AAPG. If you're older, your take-home message is at the end of the column.


WEIMER

AAPG will be 100 years old in 2017. We'd like to see it continue, but naturally, there are challenges.

One of the most critical challenges is cogently shown in this graph of AAPG membership by age. The central peak, ages 51 to 56, is the largest group, and where I reside. The peak to the left, ages 21-30, is the focus of this column. (And the small increase to the right indicates that the generation that trained my generation (ages >75) is slowly being silenced by the inexorable march of time.)



The peak to the left, ages 21-30, is the focus of this column.

Retaining and growing members like you is crucial to the future success of AAPG. All the programs we offer – services and science – are contingent on welcoming you into our Association. This fact has been recognized in the Strategic Plan, and I'll keep discussing it in subsequent columns.

Let's be frank – you're probably not thinking too far into the future at this point in your career. You have finally graduated (or are about to), and hopefully you're getting paid reasonably well for your efforts. Still, there may be student loans to pay. So you may be wondering ...

Why should you spend money to join professional societies like AAPG? How can it possibly help your career?

About 2,500 years ago, Heraclitus stated that the only constant in life is change. For your careers, this means waves of changes that continuously intersect to form intriguing challenges – and opportunities.

The first wave is the rapid evolution in software and technology (drilling, well completions, stimulation, seismic interpretation and acquisition, and monitoring methods). With every passing year, new tools and techniques let us image the subsurface with details in which previous geoscientists could only dream. As a result, unconventional resources in the United States and Canada are being developed at an astounding rate. Another result is that the boundaries between disciplines – geology, geophysics, engineering – are continuing to blur. We need to rapidly absorb the basics of related fields, as needed.

The second wave is fluctuating business cycles. Worldwide, the oil and gas industry generally runs on business cycles of two or three years. For example, after the significant decrease in commodity prices with the global recession in late 2008, oil prices have

See **President**, next page

Earth Science Week Starts Oct. 9

"Our Ever-Changing Earth" is the theme of Earth Science Week 2011, which is an annual event that promotes scientific understanding of our planet.

A poster promoting activities being held Oct. 9-15 is inserted in U.S. addresses of this issue of the EXPLORER at pages 10-11.

Among the events are three national contests, including:

- Grade K-5 students creating artwork illustrating the various ways air, water, land and living things change over time.
- Essays by grades 6-9 students on how interactions between Earth's systems can change our world over time.
- A photography contest for all students, geologists and the general public, on "A World of Change in My Community" – capturing photo evidence of the long- or short-term changes taking place around our planet, even in neighborhoods.

The ESW program, launched by the American Geological Institute in 1998, encourages a "grass roots" effort for the geosciences community to publicize the event, distribute teaching materials and provide guidance for those interested in participating in ESW.

Earth Science Week is organized annually by AGI with support from the AAPG Foundation, the U.S. Geological Survey, NASA, the U.S. National Park Service, ExxonMobil, ESRI and others.

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TABLE of CONTENTS

REGULAR DEPARTMENTS

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


Photo courtesy of Ron Harris and Darren Johnson

Track drills at work in the Marcellus Shale. See page 12.

ON THE COVER:

A spectacular view of Passo Pordoi from La Terrazza delle Dolomiti – and a great overall view of the Italian Dolomites, the famed mountains of northeast Italy that have captivated geologists, adventurers and tourists for centuries. The mountains are within hours of Milan, site of this year's AAPG International Conference and Exhibition, which will be held Oct. 23-26. There's still time to save money by registering for the meeting online – see page 28. Photo by Joel Sowers.

Vol. 32, No. 9

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Candidate Info Available Online

Biographies and individual information and videos for all AAPG candidates for the 2012-13 Executive Committee is now available online at www.aapg.org.

The material includes each candidate's written response to the question of why they accepted the invitation to stand for public office, plus a brief video statement by each candidate that was filmed at the recent AAPG Leadership Days event in Boulder, Colo.

The president-elect winner will serve in that capacity for one year and will be AAPG president in 2013-14. The vice president-Sections and secretary will serve two-year terms, beginning July 1.

Ballots will be mailed in spring 2012.

The slate is:

President-Elect

❒ **Donald D., Clarke**, geological consultant, Lakewood, Calif.

❒ **Lee Krystinik**, Fossil Creek Resources, Arlington, Texas.

Vice President-Sections

❒ **Thomas E. Ewing**, Frontera Exploration Consultants, San Antonio.

❒ **Kenneth E. Nemeth**, Schlumberger Seismic Reservoir Characterization, Houston.

Treasurer

❒ **Rebecca L. Dodge**, Midwestern State University, Wichita Falls, Texas.

❒ **Deborah K. Sacrey**, Auburn Energy, Houston.

President
from previous page

largely recovered, whereas natural gas prices remain variable. To retain our value as experts, we need to predict what skills will be useful this year, and subsequent years. Statistically speaking, you will likely work for several companies in your career, whether it's a major, an independent, or your own consultancy. (By the way, this is also true for those of you who currently work for National Oil Companies.) Plan accordingly.

Finally, the third wave is you. As you work on different projects, your interests may change. So you may need to learn new skills, and maybe even get a different job, to focus on what interests you.

What does all this mean?

My suggestion is that to ride these waves of change, approach your career as if you one day will work as a consultant. This means you should plan in terms of how you approach your work. Learn as much as you can, stay up on technology, develop good networking abilities, and continue updating your education all the time. When I started my career in 1978, I was told that our half-life in scientific knowledge is eight years. This means that every eight years you have to reinvent yourself, and I think that is still a good rule-of-thumb.

To succeed amidst these waves of change, you'll need resources to call upon, resources that are greater than yourself. Consider professional societies such as AAPG as the only constant in your professional career. You'll need up-to-date scientific knowledge to keep up with and ahead of trends. You'll need to know people who can help you find jobs – and if you're lucky, you'll need to know who to hire.

AAPG is one of our best career resources. At a minimum, AAPG is a kind of professional insurance policy – some years you may use AAPG resources more than others, but the resources will always be there. Or you can take it a step further and become a leader, at the local, national or international level. My observation is that the more you engage the AAPG, the better chance you have for success in your career.

"Statistically speaking, you will likely work for several companies in your career ... plan accordingly."

* * *

Now a message for those of you who are in the >40-year old category on the graph. Pick a colleague who is younger than you, and take him or her to lunch. Talk about how you are riding these waves of change in our profession; and while you're at it, mention how professional societies have helped you. Treat this as a conversation between fellow travelers on the same path, not a monologue from an elder statesperson. As an educator, I am extremely fortunate to work with young geoscientists daily; they are passionate, well-informed, and assimilate large amounts of information quickly. You will learn an incredible amount from them.

It's so simple for you to do this. But the interest you take in others will ultimately form your legacy and help AAPG enormously.

Paul Weimer

Lange given new title

Curtiss Named Next AAPG Executive Director

David Curtiss, former director of the AAPG GEO-DC office, has been named executive director of AAPG and the AAPG Foundation effective Aug. 16, succeeding Rick Fritz, who resigned in April after 11 years at the helm of the Association.

Additionally, the AAPG Executive Committee named AAPG Chief Financial Officer David Lange to the newly created post of deputy executive director for AAPG and the AAPG Foundation. Lange had served as interim executive director since April.

AAPG President Paul Weimer, in making the announcement, said, "The promotion of Curtiss and Lange to these two positions will ensure that AAPG continues to flourish as a professional society as it addresses the diverse and complex needs of its membership."

Curtiss served as director of the AAPG Geoscience and Energy Office in Washington, D.C., since 2008, after serving as deputy director of the office since its inception in 2005.

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

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

He also contributed his geologic expertise to industry-funded petroleum studies in Algeria, Argentina, Azerbaijan, Colombia, Egypt, Kazakhstan, Morocco, Russia, Turkmenistan, Uganda and the United States, plus several global exploration opportunity assessments.

Curtiss first joined EGI in 1995 as a research assistant and was manager of program development when in 2001-02 he served as a Legislative Fellow, serving in the office of U.S. Rep. J.C. Watts (R-Okla.), who also was chairman of the Republican Conference in the U.S. House of Representatives.

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

He is a member of AAPG.

Lange joined AAPG as business director in 2002 and was named AAPG's chief financial officer in 2006, and is responsible for oversight of all financial activities for both the AAPG Association and AAPG Foundation.

Lange manages AAPG's business directorate, which includes accounting, membership, information technology and office services.

Lange received a bachelor's in business administration from Southeast Missouri University and a master's in business administration from the University of Missouri. He previously was vice president of marketing and administration for Mitsubishi International.

He also has held executive management positions at Saddleman Inc. in Logan, Utah, and Purolator Products in Tulsa. He also was a consultant for Welling & Vanderslice, in Tulsa and served as statistics editor for the Oil & Gas Journal.

"We extend our very best wishes to both David Curtiss and David Lange in their new positions," the Executive Committee said in making the announcement. "We are confident that the Association and Foundation are in capable hands that will help lead the future success of the organization."

The current AAPG Executive Committee, in making the announcement, also thanked the Search Committee, which comprised the 2010-11 Executive Committee (David Rensink, Search Committee chair, who was AAPG president for 2010-11; Marvin Brittenham; Alfredo Guzmán; David Hawk; William Houston; Steve Laubach; Jim McGhay; and Paul Weimer, SC vice chair) and William Fisher (AAPG Foundation).


CURTISS

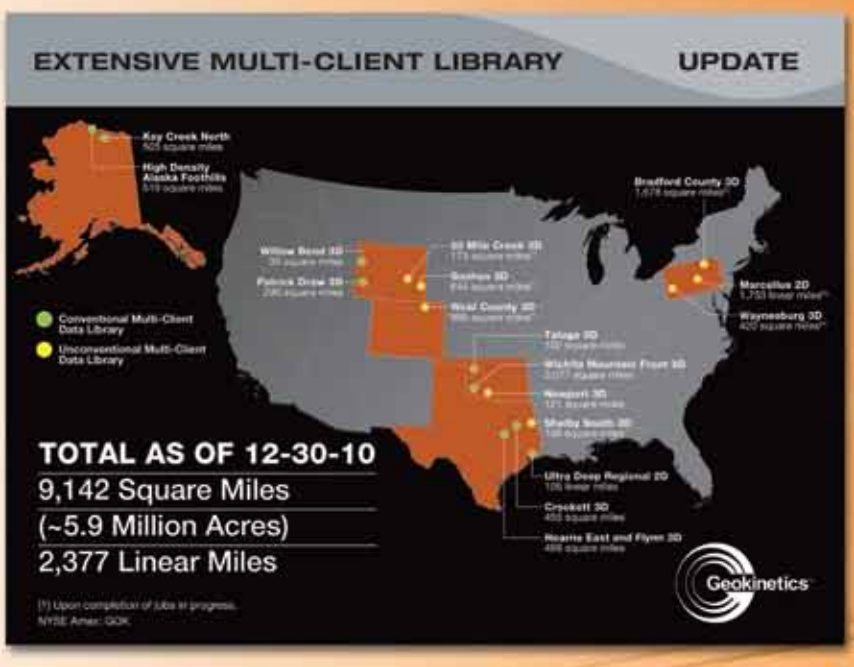
> **"We are confident that the Association and Foundation are in capable hands that will help lead the future success of the organization."**

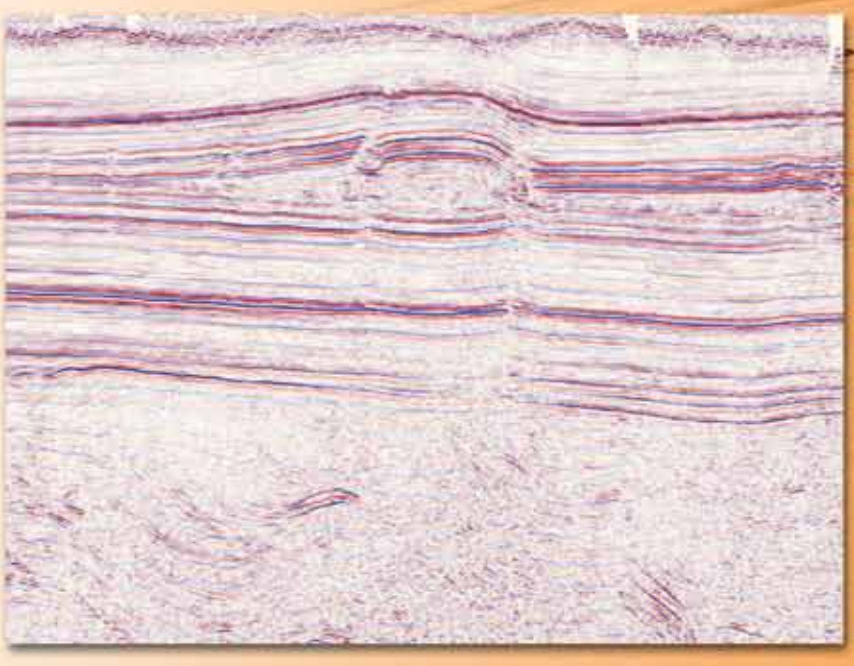

LANGE

Past AAPG Executive Directors

J. Elmer Thomas 1917-19
Charles E. Decker 1919-26
J.P.D. Hull 1926-52
Robert H. Dott 1952-63
Norman Smith 1963-72
Fred A. Dix 1972-96
Lyle Baie 1996-99
Rick Fritz 1999-2011

KNOWLEDGE





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GEOPHYSICAL REVIEW

Case study to be presented in Milan

3-D Helped Get View of Marcellus Area

By LOUISE S. DURHAM, EXPLORER Correspondent

Action in the geographically widespread Devonian-age Marcellus shale natural gas play in the northeastern United States – despite challenges ranging from financial to technological concerns – continues at an intense pace.

More than 130 rigs are actively drilling there, according to Ron Harris, senior geophysical adviser at Anadarko Petroleum Corporation. The majority of these wells are horizontal with lateral legs ranging between one and two kilometers.

Stimulation via hydraulic fracturing is *de rigueur* to enable the dense shale to give up gas in commercial amounts.

Like any play – shales in particular – the Marcellus harbors its share of challenges to keep the geoscientists and operators hard at work far beyond the so-called "bankers' hours."

Harris summarized a few of these challenges:

- Identifying shale "sweet spots," which represent areas of higher productivity that are driven by several petrophysical properties such as porosity, permeability, brittleness and total organic content.

- Optimizing well designs and geosteering through detailed, seismically derived structure maps that identify subsurface features like fold axis, faulting and collapse associated with salt dissolution.

- Optimizing the stimulation program by understanding the variances in rock properties within the shale zone and the areal distribution of Young's Modulus, Poisson's Ratio and local stress regimes.

Undeterred, Anadarko opted to be proactive and meet these challenges head-on.

To do so, the company invested about $3.5 million to fund a proprietary 67 square-kilometer, wide-azimuth, multi-component 3-D seismic survey.

Photos courtesy of Ron Harris and Darren Johnson

Track drills used for shot hole drilling in the Marcellus Shale.

> **"By acquiring this (seismic) early on, we could determine how we place our laterals as well as the length we want to drill them."**

The survey was recorded on the company's Sproul State Forest property in central Pennsylvania to determine the effectiveness of modern 3-D/3C seismic data in extracting certain rock properties from the Marcellus shale.

The shale within the study area is about 60 meters thick and occurs at a depth of 2.6 kilometers.

Getting a Good Handle

The seismic survey was recorded and processed by CGG Veritas and processed once again by ION's GX Technology group, which performed data integration as well.

The month-long survey occurred in 2009, when Anadarko already had one vertical well drilled on this property and was busy implementing frack jobs on two laterals.

"These were the first wells we drilled and completed in the Marcellus, which has more structural complexity than most shales in the United States," Harris said.

"The geologist doing the steering must be highly proactive to keep the bit in zone while geosteering," he continued, "as there's so much structural deformation and folding due to the considerable orogenic activity that has occurred in this part of North America.

"By acquiring this (seismic) information early on, we could determine how we place our laterals as well as the length we want to drill them," he said.

"We've now drilled a third lateral, and it's the best so far," he continued. "It agrees with some of the predictive rock properties from the seismic data, such as properties that show an increase in the total organic content, the presence of a larger number of fractures and better brittleness.

"What's unique about this project, which recorded both P waves and shear waves, is we've been able to get a better handle on things like Poisson's Ratio – the measure of how this rock is going to deform in one axis relative to another – and Young's Modulus, which is a measure of the rock's elasticity," Harris noted.

"It's been a good project for us at the beginning of our program," he added, "so we can see what kind of challenges we would have, both structurally and from rock physics."

Harris noted that the company might drill perhaps five to 10 additional wells to test the predictions made off of the survey.

AAPG member John Tinnin, with GX Technology in Houston, will present the paper "North American Case Study Demonstrates the Ability of 3-D/3C Seismic Data to Predict the Petrophysical Properties of Shale" at the upcoming AAPG International Conference and Exhibition in Milan.

Tinnin's paper will be given at 4:50 p.m. Monday, Oct. 24, as part of the AAPG/EMD technical session on "Shale Dynamics: Rock Properties to Hydrocarbon Generation."

His co-author is Ron Harris, with Anadarko Petroleum Corp., also in Houston.

Anadarko Petroleum drilled in Pennsylvania's Sproul State Forest to determine the effectiveness of modern 3-D/3C seismic data in extracting certain rock properties from the Marcellus shale.

Geophysical crews in the staging area, waiting for recording equipment to be deployed via helicopter.

GEOPHYSICAL REVIEW

Cable vs. cableless

Nodal Seismic Passes Frigid Siberia Tests

By LOUISE S. DURHAM, EXPLORER Correspondent

Seismic data acquisition on land has a reputation for being a challenging undertaking, especially for crews working with the long-popular cable acquisition systems.

Survey locales vary considerably, including jungles, mountainous terrain and specific environmentally protected areas. Who wants to lug copious amounts of heavy cables and equipment into such places?

Once there, deploying this type of instrumentation is a whole other problem, as it's known to create a major footprint – sometimes a damaging one.

Frequent troubleshooting required with these cable systems is probably the most outstanding problem. This can require crew members to make numerous time-consuming return trips into the area, enlarging the footprint and decreasing productivity, which equates to considerable added expense.

Consequently, companies large and small are increasingly looking to cable-free nodal systems as the preferred technology. Among the many advantages they offer is a total lack of the need for troubleshooting. This translates into faster shooting, increased productivity and lower cost overall, along with decreased potential for those sometimes-disastrous health, safety and environmental incidents.

Several nodal seismic systems are available carrying varying designations, such as cableless, cable-free, no cable.

Photos courtesy of FairfieldNodal

Putting cableless technology to the test: Old Russian military truck – carrying 206 ZLand seismic nodes and five people – sits behind a node buried up to the neck at the Russkoye oilfield.

These include FairfieldNodal ZLand®, INOVA FireFly®, Sercel UNITE and OYO GSR.

Still, this industry has long been known for its cautious pace in adopting new technology, and nodal seismic systems are no different. Even today, after several years of node availability, the oft-expressed demand from potential clients is "prove it, and do so on my turf."

"Clients want a demo set in their own backyard to be convinced to use it," said Keith Matthews, systems division sales director at FairfieldNodal. "Then they'll believe it."

This is particularly understandable when working across the frigid region of Siberia, where the company recently arranged two field demos using ZLand, which has the distinction of having absolutely no cables of any kind.

For comparison purposes under Arctic conditions, the nodal implementations were performed alongside a 428 cable system, which is commonly used by the companies in the region.

First Steps in Boguchany

The initial demo occurred in Boguchany in the Krasnoyarski region in central Siberia. It was conducted by Boguchanskaya Geophysical Expedition (BGE), a division of Geotech Holding, Russia.

A total of 202 nodes continuously recorded seismic data for four-plus days in snow-covered forests where temperatures dropped as low as -22 C.

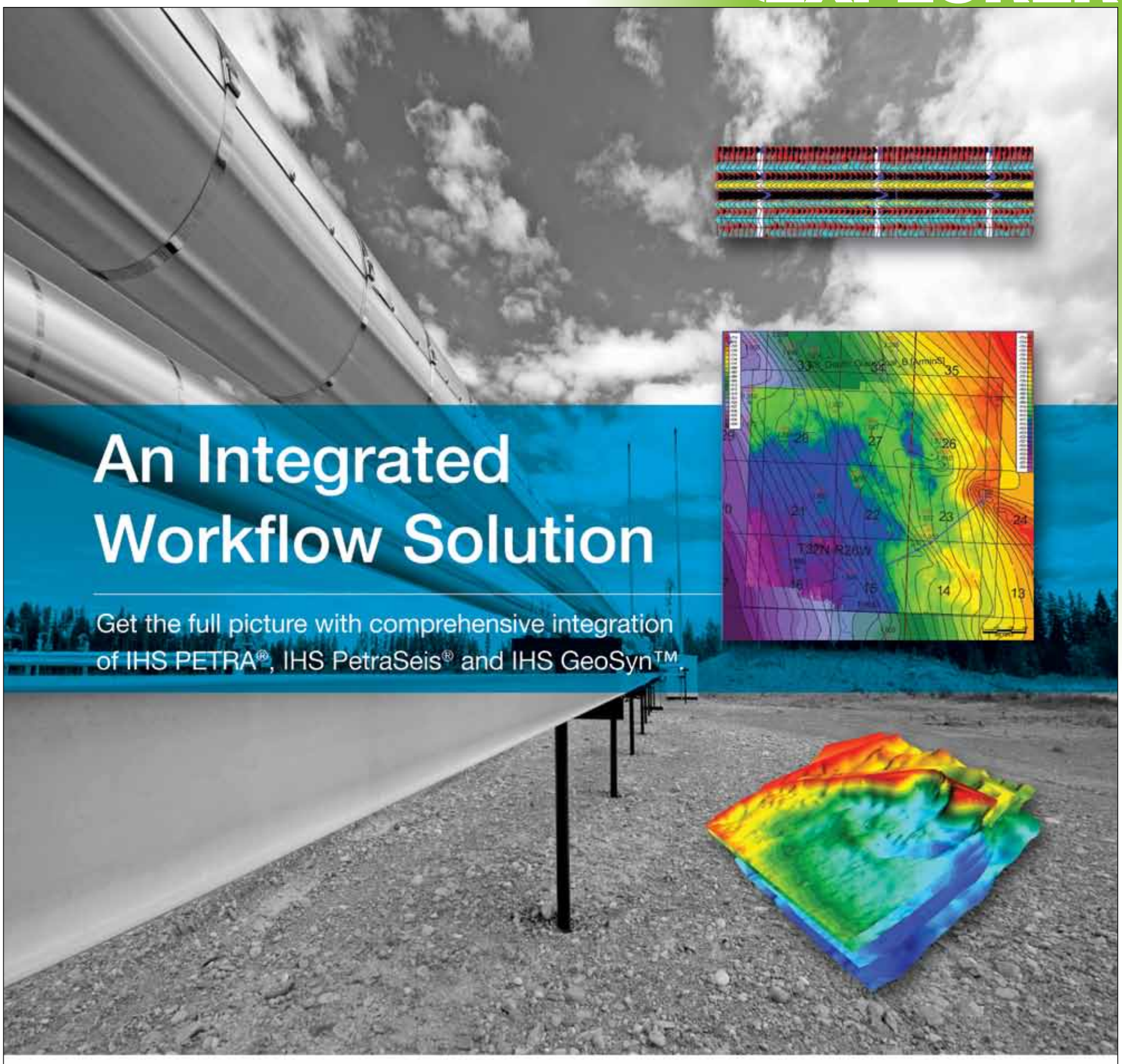
Enclosed in a high impact case, these small, self-contained battery-equipped autonomous units tip the weight scale at 4.8 pounds; they measure six inches high, five inches in diameter and have a five-inch ground-coupling spike.

At Boguchany, the nodes worked with an electromagnetic impulse energy source (KEM-4), proving that the combination could dramatically increase production in densely forested areas under extreme temperature conditions.

The nodes were spaced 50 meters apart on a 2-D line, alongside a 428-cable layout. Trees reached as high as 17 meters, and the snow was as much as 80 centimeters deep. Even though buried 10-to-50 centimeters in the snow, the nodes all functioned perfectly.

Rapid deployment, superior coupling in the snow and high quality data

See **Nodes**, page 16



When these three solutions seamlessly connect, geological and seismic workflows are streamlined with easy-to-interpret data and modeling tools. This integrated bundle allows you to access, view and manipulate information within the same project; create multidimensional seismic models and synthetics; improve workflow collaboration; and deliver comprehensive proposals for new prospects. Get to the field faster with seismic, well, production, log and economic data at your fingertips.

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‘Nodes Are the 21st Century’

Clearly, the two Russian projects involving nodal seismic systems was a giant effort undertaken to help prove the merits of a relatively new technology.

When you’re on a roll, it pays to keep going – and the demos were followed up by a seminar focused on land nodes.

The seminar, which was sponsored by FairfieldNodal, was held in St. Petersburg, Russia, June 23-24. The event was organized and managed by SEVMORGEO, which focuses on seismic data acquisition and processing. SEVMORGEO helped to organize the demo program.

The get-together attracted 65 attendees representing a wide range of locales and companies, including Integra, Geotech, Rosneft, SOCAR AZ, IOT and TNK-BP. The audience members represented Houston, Moscow, Delhi, Sakhalin, Baku AZ, Kazakhstan, among many others.

The interest and enthusiasm were palpable, according to Keith Matthews, systems division sales director at FairfieldNodal.

The speaker’s roster included a few Russians who presented their thoughts on nodal technology and its value to industry.

“Peter Zelenko, field operations manager, went so far as to say ‘this is the way to get us out of the 20th century and into the 21st,’” Matthews said. “He exclaimed that ‘nodes are the 21st century.’”

This line of thought was echoed by Steve Mitchell, vice president of systems and division manager at FairfieldNodal, in his closing remarks at the seminar.

“What you are seeing is the future of seismic,” Mitchell emphasized. “We must think toward the future, not toward the past.

“Technology has allowed us to do so many more things and economically place so many more receivers on the ground,” he noted. “As an industry we need to utilize that technology and move forward via unique thoughts and ideas; without cables, this can be done.”

– LOUISE S. DURHAM

Nodes
from page 14

prompted BGE chief geophysicist Victor Bogdan to sum up the results succinctly:

“It is amazing how similar the seismic records are from the land nodal system with single phone receiver versus cable system with 12 geophones per string …” he said.

“This system is a must for difficult areas such as mountains, heavy forest, rivers and other remote locations,” added Ivan Korbaleev, acquisition manager and impulse energy source expert.

On To Russkoye

The successful Boguchany program was followed by the demo at the Russkoye oilfield in western Siberia. The data acquisition there was performed by a division of “Yamalgeophysica-Vostok,” OAO “Integra Geophysica.”

The heavy oil Russkoye field reportedly is one of the largest fields in Russia. Integra’s client there is TNK-BP.

During the eight-day Russkoye demo, the lowest daily air temperatures ranged between -1.2 C and -22.5 C.

For this program, 206 nodes were deployed adjacent to cable geophone strings, and each node was located next to the Station Marker. The 2-D land line was 5,125 meters long, crossing roads, a river and frozen lake in a flat tundra environment.

Over the course of the five-day shoot, ZLand and 428 XL recorded 3,083 shot points.

“During deployment, two Russian operators started up each node using the nodal land system’s Hand Held Terminals and under our supervision,” said Krassimir Nikov, regional sales manager for Russia, CIS & EU at FairfieldNodal. “The operators stamped each node as forcefully as possible into the snow.

“No one walked the line or checked the status of the nodes during the survey,” he noted. “All nodes recorded seismic data during this five-day period with no mechanical or electronic failures.

“For pick-up, two young Russian operators with no specialized training for retrieval performed the entire procedure,” Nikov said. “On each station, they located the node by the Station Marker, but removal of the nodes was challenging because they had ice contact with the surrounding snow; the operators gave them a solid kick to remove them.

“Because all nodes were buried under the snow, they had excellent coupling, except for one found by the road in a horizontal position, apparently moved by a vehicle,” he noted.

The next step entailed transferring all of the data to the recorder in SEG-D format. The data were then formatted in SEGY. FairfieldNodal didn’t have the right to processs the data from ZLand and the 428 system; consequently, the data processing of the two sets was performed by two independent Russian companies – Crew 33 (Alexander Volovnikov) and IGSS, Moscow (Tatyana Grechishnikova).

One hundred percent of all seismic data were recovered from each node in both demos.

At Russkoye, the demo proved that even when the nodes are located next to a strong noise generator, the data quality can be improved significantly by noise

See **Siberia**, page 20

Photo courtesy of Anadarko Petroleum

Seismic crews bury the geophones – semi-permanently – for the Salt Creek 4-D program.

4-D: Fine interval resolution

'Time Lapse Seismic' Tracks CO_2 Flood

By DIANE FREEMAN, EXPLORER Correspondent

There may be many reasons for the success geoscientists recently reported at Salt Creek, Wyo. – but a big one was the result of data collected from a 4-D seismic survey, which revealed fine interval resolution as well as identified flow patterns that cannot be seen from well data alone.

That's the report of Houston geophysicist John O'Brien, a geophysical adviser and team leader at Anadarko Petroleum Corp., who earlier this year discussed the findings at the annual 3-D Seismic Symposium in Denver.

There, O'Brien presented a time-lapse study that monitored a CO_2 flood with fine time steps in Salt Creek, a mature oilfield located in Wyoming's Powder River Basin.

The first well was drilled there in 1908. Since then the field has been produced under primary production, waterflood and, most recently, a tertiary CO_2 flood.

"At Salt Creek, it was a shallow reservoir, and a lot of oil wells had been drilled there over the years," he said. "There was a small injection pattern and really tight well spacing."

All of which made the 4-D seismic survey results of note: Features were consistent from survey to survey and also resulted in fine interval resolution.

"We're convinced we're seeing strong time lapse responses associated with CO_2," he said.

The study also resulted in more details and higher confidence in observations and interpretation. By characterizing fluid flow in the reservoir, the team was able to see flow patterns that cannot be seen from well data alone, he said.

Study Details

The baseline study was acquired in March 2008, O'Brien explained. Then CO_2 was injected and five surveys were conducted, with the final one completed in July 2009.

"We wanted to progressively watch it move over time and used multiple monitors," he said. "We're all trying to get the most out of our seismic data as possible.

"How can we improve the time lapse seismic on reservoirs?" he asked. "We took multiple flash shots so we could see the fluid flow in the reservoir."

To manage the CO_2 flood, a time-lapse seismic program was designed over a portion of the field, and a semi-permanent monitoring system with geophones was set up at a shallow depth.

The CO_2 flood was designed with a small injector pattern of 20 acres. The separation between wells in a pattern was 600 to 700 feet, requiring high spatial resolution for time-lapse monitoring on the scale of the interwell spacing, he said.

The CO_2 was expected to advance rapidly over these distances, calling for short time periods between monitor surveys.

For the program, geophones were deployed to a depth of 18 inches. Once deployed, the geophones remained in place for the complete monitoring program.

"Then five monitor surveys were recorded at intervals of approximately three months," he said. "Each survey was recorded in approximately four days."

The survey imaged 45 contiguous injection patterns consisting of a central injection well for each surrounded by four production wells covering about 20 acres.

"We were looking for high quality seismic data at a fairly shallow target," O'Brien said.

Observations

With multiple images recorded at different times, the team was able to observe the initial flood at each injector, follow it as it expanded over time and characterize it spatially.

See **4-D**, page 20

Node deployment on the Boguchany line in Siberia.

Siberia
from page 16

attenuation processing as shown by the IGSS processing.

Also, the GPS inside the equipment functioned with no problems despite the snow and trees. It was locked on eight satellites.

Being There

The two Siberian demonstrations could help convince the industry of the reliability and high productivity of nodal seismic data acquisition, even in extreme weather conditions. The capability of the nodes to record data continuously for many successive days without any manual monitoring is highly attractive in this and other environments.

"The land node operations have a lot in common with playing a smart chess game," said Yuri Zaitsev, director of BGE, which implemented the Boguchany survey. "It gives you freedom in choosing the winning moves, freedom in any energy source combinations, freedom in placing the nodes anywhere onshore, freedom in increasing drastically (the) production."

It could be argued that the effort expended to implement the actual field activity pales somewhat when considering what was required to set up this entire program.

FairfieldNodal shipped 1.75 tons of equipment via air to St. Petersburg, where it was unloaded onto a truck to travel to the Boguchany site and then to Russkoye field before returning to St. Petersburg for the air trip back to Houston.

The truck transported the equipment 3,000 kilometers across Russia in the middle of Siberia in mid-winter in a time span of five days.

But even the best drivers are subject to the mechanical "whims" of a vehicle, and the truck experienced a breakdown.

"Renting another truck in middle Siberia is not that simple – they don't take American Express," Matthews quipped. "It was cash only, so we had cash transferred to the middle of Russia. It was quite an adventure."

4-D
from page 18

"Data can be acquired repeatedly in a very efficient manner," O'Brien said. "We also can evaluate the consistency of trends observed on multiple surveys and assess the level of confidence in our observations."

This design led to a true time lapse monitoring of progressive changes in the reservoir rather than the common practice of a couple or a limited number of surveys taken over a longer time period to obtain a before-and-after comparison, he said.

Indeed, if there was only a baseline and a final study recorded 16 months later, "we could identify areas with higher or lower sweep efficiency, but would not gain the same insights into the mechanisms driving these differences," he said.

O'Brien noted the study's results showed a breakthrough at some wells with the CO_2 produced, but not at all of them.

"There is a significant amount of variability," he said. "The pattern response was not uniform and there were differences from pattern to pattern.

"Injected fluids do not flow predominantly in a radial direction from injector to adjacent producers," he concluded. "Instead, time-lapse imaging demonstrates a significant degree of asymmetry indicating a strong flow component in the up-dip direction with lesser sweep in the strike and down-dip directions, most likely related to CO_2 buoyancy."

He said fluid flow cannot be characterized as a symmetric five-spot pattern that serves as a unit cell to describe the flood.

"We now recognize the relationships between adjacent patterns and fluid flow across pattern boundaries," he said.

Name the gas industry birthplace

Fredonia, N.Y.?

By KEN MILAM, EXPLORER Correspondent

Quick history quiz:

Q: *Where and when was the natural gas industry born?*

A: If you said Titusville, Pa., in 1859, when Colonel Edwin Drake drilled his famous oil and gas well, most people in the industry agree.

Q: *What town was the first on the globe to be lighted by commercially drilled, produced and delivered natural gas?*

A: Fredonia, N.Y., about a 90-minute drive from Titusville.

Q: *When?*

A: 1825.

Wait a minute ... 1825? 1859?

AAPG member Gary Lash thinks pioneering individuals and their successes at Fredonia deserve more than a historical footnote – and the village should be recognized as the birthplace of the natural gas industry.

Lash is director of the Shale Research Institute and a member of the geology department at the State University of New York, College at Fredonia, and he and his wife, Eileen, have researched historical and contemporary newspaper accounts and believe Fredonia has been unfairly overshadowed by Titusville.

Gas seeps in the area were well known to natives and settlers. William Aaron Hart, a tinsmith, drilled a well 27 feet into a slate formation in 1825, hoping to tap the gas beneath the surface. He succeeded and soon began piping gas to the village, metering and selling it to local businesses for lighting, according to newspaper accounts of the day, Lash said.

Hart's achievements haven't been totally overlooked by the industry.

The Natural Gas Supply Association, on a history section on its website at naturalgas.org, says Hart is regarded by many as the "father of natural gas." Expanding on Hart's work, the Fredonia Gas Light Company was eventually formed, becoming the first American natural gas company.

Still, the NGSA site says, "… Most in the industry characterize (Drake's Titusville) well as the beginning of the natural gas industry in America."

The Lashes contend Hart's accomplishments deserve more recognition.

Birth of an Industry?

They also suggest another forgotten Fredonian, Preston Barmore, a young relative of Hart's by marriage, deserves to be called the first petroleum engineer.

Born in 1831, 26-year-old Barmore recruited investors and in 1857 drilled two gas wells on Canadaway Creek, less than a mile downstream from Hart's historic well where production apparently was less than satisfactory.

> **Two months before the Drake well hit, most of the village's stores, businesses and street corners were illuminated by gas.**

The Lashes say Barmore, a then-recent graduate of Fredonia Academy, the forerunner of SUNY College at Fredonia, "appears to have understood the importance of fractures (joints) as conduits of gas through the shale."

The area's geology had been described in at least one major report before this. Barmore lowered an eight-pound charge of gunpowder 122 feet into one well. He then dropped a red-hot iron down a slender, tin tube. The resulting explosion resulted in a substantially greater flow of gas.

This attempt to artificially induce fractures was history's first documented frack job, the Lashes say.

A second blast at a greater depth collapsed the well, indicating a "deep" source of the gas.

"It is important to recall that Barmore was carrying out his experiments more than a year before Colonel Drake drilled his well in Titusville," Lash said, adding that "the level of scientific thinking exceeded that of Titusville."

An inscribed boulder marking the general area where Hart drilled his well was

See **Origins**, page 24

Titusville Earns Love, Too

By BARRY FRIEDMAN, EXPLORER Correspondent

It is approximately 80 miles between Titusville, Pa., and Fredonia, N.Y. – and while nobody is suggesting the rivalry between these two cities is on par with, say, the competition between the Red Sox and the Yankees, the origins of the petroleum industry is becoming a bone (a well?) of contention.

The problem: Both say the profession began with them.

Titusville is home to the Drake Well Museum; Fredonia simply wants some love.

"We really do believe that Fredonia's part in the establishment of the natural gas industry has been overlooked, perhaps partly a consequence of its relatively close proximity to Titusville," says AAPG member Gary Lash, who is director of the Shale Research Institute and teaches geosciences at SUNY-Fredonia – and who is taking this slight a bit personally.

He has no doubt that the industry should look more north if it wants to find its DNA.

"I believe the natural gas industry (both upstream and downstream sides) was started in Fredonia, N.Y., with the drilling of a gas well along Canadaway Creek," he avers.

"The initial event was William A. Hart's 1826 decision to kick down a well on Canadaway Creek in downtown Fredonia," Lash said. "He was able to use the gas to illuminate some nearby businesses."

Further, he adds, it was Preston Barmore, who Lash calls "the first petroleum engineer," who decided to induce artificial fractures in rock that was not yielding gas in 1857.

"He knew that gas flowed through fractures that he and others had observed

See **Disputes**, page 24

The past is the key to the future

To understand the prediction and distribution of resources it can be useful to turn the principals of uniformitarianism on their head. Imagine if you could restore geological data and interpretations to their palinspastic position and see their geological context at the time of deposition. Imagine if you could identify prospective trends in this context and then restore them to their present day configuration…

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Origins
from page 22

dedicated by the DAR about 100 years after the event, and remains in place today, Lash said. The village of Fredonia adopted an image of a five-burner seal as its official town emblem when it was incorporated in 1829.

"It is intriguing that as industry moves rapidly to the burgeoning shale plays in the country, the industry was initiated as a gas shale play in the first half of the 19th century," Lash said.

Unparalleled

Hart's source rock was the Upper Devonian Dunkirk black shale, he said.

About three years ago a gas well was drilled on the SUNY Fredonia campus, and the county is the most heavily drilled in New York state, Lash said.

"One can argue over the date that the first gas well was drilled (gas had been recovered from salt brine wells in West Virginia a decade earlier than the well drilled in Fredonia); however, we contend that the industry started in Fredonia," Lash said.

"By industry, I mean the drilling of wells, collection of gas in a central location (a gasometer in the middle of the village), delivery of gas to various locations (homes, businesses, street lights), metering of the gas (by the way, gas sold for $4 per cubic feet in Fredonia in 1858) and the chartering of the Fredonia Natural Gas Co.," he added.

Accounts from the time in the local newspaper, the Fredonia Censor, show that by June 1859, two months before the Drake well would come in, most stores and businesses in the village as well as several street corners were illuminated by gas.

In the years following Preston Barmore's success along Canadaway Creek in Fredonia, natural gas exploration in western New York targeted deeper units, notably the Silurian Medina sandstone. The Devonian black shale units, including the Dunkirk, Rhinestreet and Marcellus shales, were largely ignored
until relatively recently, Lash said.

Lash sums up with a quote from a Dr. Michael, a scientist involved in natural exploration in western New York from its beginning, describing the commercial use of natural gas in Fredonia. He called it:

"An instance unparalleled on the face of the earth."

Disputes
from page 22

in shale exposed along nearby Canadaway Creek that flows through downtown Fredonia," Lash said. "Barmore reasoned that the low flow of gas exhibited by his newly drilled well along Canadaway Creek reflected the poorly fractured nature of the rock; thus, he decided to induce artificial fractures by using seven pounds of gunpowder in his 120-foot-deep well. And it worked."

And Lash said this was done a year before Edwin Drake's well in Titusville came in.

On the Other Hand …

For its part, Barbara Zolli, director of the Drake Well Museum in Titusville (which bills itself as "Birthplace of the Oil Industry") says, "I'm puzzled by Gary Lash's proposition. We always acknowledge that it began in Fredonia, N.Y."

She wonders, though, if the hard feelings and misconception comes from something as simple as language.

"Could the confusion come from our claim that the petroleum industry started here?" she asks. "I know that many people use that term to be all-encompassing, but I have heard from friends in the natural gas industry that they usually prefer to be identified separately and not lumped together."

Lash's response?

"Our goal has been to simply offer some historical perspective on the beginnings of the natural gas industry (similar to what has been done for the historic events that took place in and around Titusville). It really has nothing to go with being 'identified separately' from Titusville.

"Moreover," he says of Fredonia, "the town used the natural gas to light street lamps and to provide illumination for some businesses before the advent of oil extraction in the Titusville area."

Lash wants to make it clear, though, his efforts are not an attempt to minimize what Drake accomplished or marginalize the importance his work in Pennsylvania.

"I don't believe that Titusville has gained too much credit," he said. "Rather, Fredonia should receive more recognition for its role as the birthplace for the natural gas industry."

Eileen Lash, Gary's wife, is as passionate as her husband – perhaps more – about Fredonia and its place in geological history.

"He (Gary) holds his breath every time I open my mouth," she said.

"Our view is that it isn't so much a matter of two towns fighting as it is Fredonia gaining some measure of recognition, especially as natural gas appears on the verge of seeing natural gas play a larger role in our energy policy."

Lash, who is the assistant director of the SUNY Fredonia Shale Research Institute, says she knows just enough geology to "be dangerous," but believes Fredonia has always suffered from an identity crisis.

"I guess Gary and I want people to understand the role that Fredonia had in establishment of the natural gas industry," she said. "In other words, we want people to come to know William Hart and Preston Barmore in the same light that they know Edwin Drake – and recognize Preston Barmore as the Father of Petroleum Engineering."

One more thing: The Lashes want you to know that this August, Fredonia celebrated the 186th anniversary of the first lights being turned on by natural gas.

This too: Titusville this year is celebrating its 152nd.

Les Nutt, borehole seismic marketing manager for WesternGeco GeoSolutions in Houston, will present the paper "Recent Developments in 3-D VSP Acquisition and Processing" at this year's AAPG Mid-Continent Section meeting, which is set for Oct. 1-4 in Oklahoma City. Nutt's paper will be presented at 9 a.m. Monday, Oct. 3.

3-D can be acquisition challenge

Key to Successful VSP Is Planning

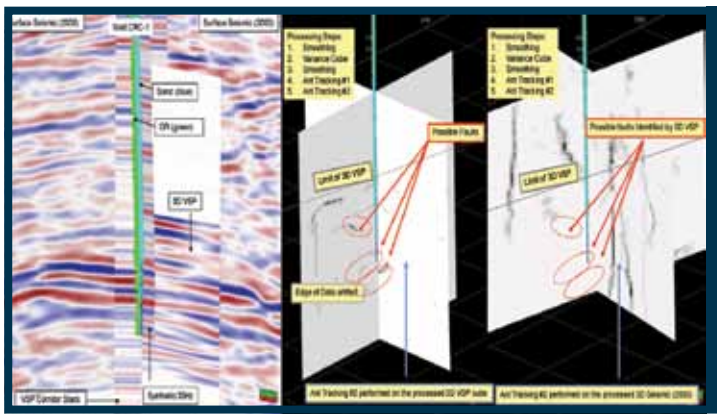
By KEN MILAM, EXPLORER Correspondent

If three-dimensional vertical seismic profiling sounds complex to geologists, well, that's because it is – but don't be deterred.

The process has proven its value for several decades and continues to deliver in the right conditions.

But the key to success lies in planning – and perhaps even in deciding whether or not to perform a VSP survey – according to Les Nutt, borehole seismic marketing manager for WesternGeco GeoSolutions in Houston.

"Many (proposed surveys) are not done," the victims of simple logistics or economics, Nutt said.



Left: A four-way well tie using synthetic, a VSP corridor stack, 3-D VSP and 3-D SS images. Right: The fault interpretation results done in Petrel using 3-D VSP, which allows indentification of possible reservoir faults.

Graphic courtesy of Schlumberger

The recent introduction of very long array tools – often more than 100 levels – plus better sources and source control and advances in imaging techniques have helped make 3-D VSP a valuable asset in complex geological environments, such super-deep wells like those in the Gulf of Mexico, Nutt said.

On the other hand, in the Middle East the emphasis is more on refining the resolution and getting clearer images of targets identified in old surveys, he said.

Repeating a survey adds a fourth dimension – time – making VSP a useful method in reservoir monitoring, particularly helpful in fields such as carbon sequestration, he said.

Routine applications for 3-D VSP have included imaging and characterizing clastic reservoirs under various complex overburdens, including shallow gas clouds, salt, carbonates and for reservoirs of generally low acoustic impedance contrast.

In deep, sub-salt wells in the Gulf of Mexico, "any sort of image is an improvement," Nutt said.

In Middle Eastern fields, the technique is applied to enhance the resolution of subsurface images for continuing exploitation and horizontal attacks, he said.

Downhole geophones are used to hone interpretations from old surface seismic, helping companies direct new drilling closer to the best targets, Nutt said.

In the 1990s, a tool might have only five levels, and would be moved during the survey to provide perspective from additional levels, he said.

Today's arrays let companies complete complex surveys in one pass, greatly reducing lost drilling time.

With downtime costs ranging up to $1 million per day, the quicker the survey the better, he said.

The new, longer arrays "were built to address that issue," he said.

Challenges to Tackle

Three-D VSP acquisition remains, however, a logistical challenge.

It is, Nutt says in his Mid-Continent abstract, a tool that requires creative thinking for choice of source and source deployment and is bound by the operational constraints of drilling the well and the placement of a suitable receiver array.

Three-D ray trace modeling of the often complex subsurface is necessary to understand the subsurface coverage for any given acquisition geometry – and the subsurface coverage can often be adversely affected, particularly on land by surface conditions. It is usually not enough to simply perform ray trace modeling.

To understand and illustrate the challenges for 3-D VSP imaging in complex geological settings, Nutt and his team used the SEG Advanced Modeling (SEAM) Phase I velocity model for 3-D VSP finite difference synthetic data generation and imaging.

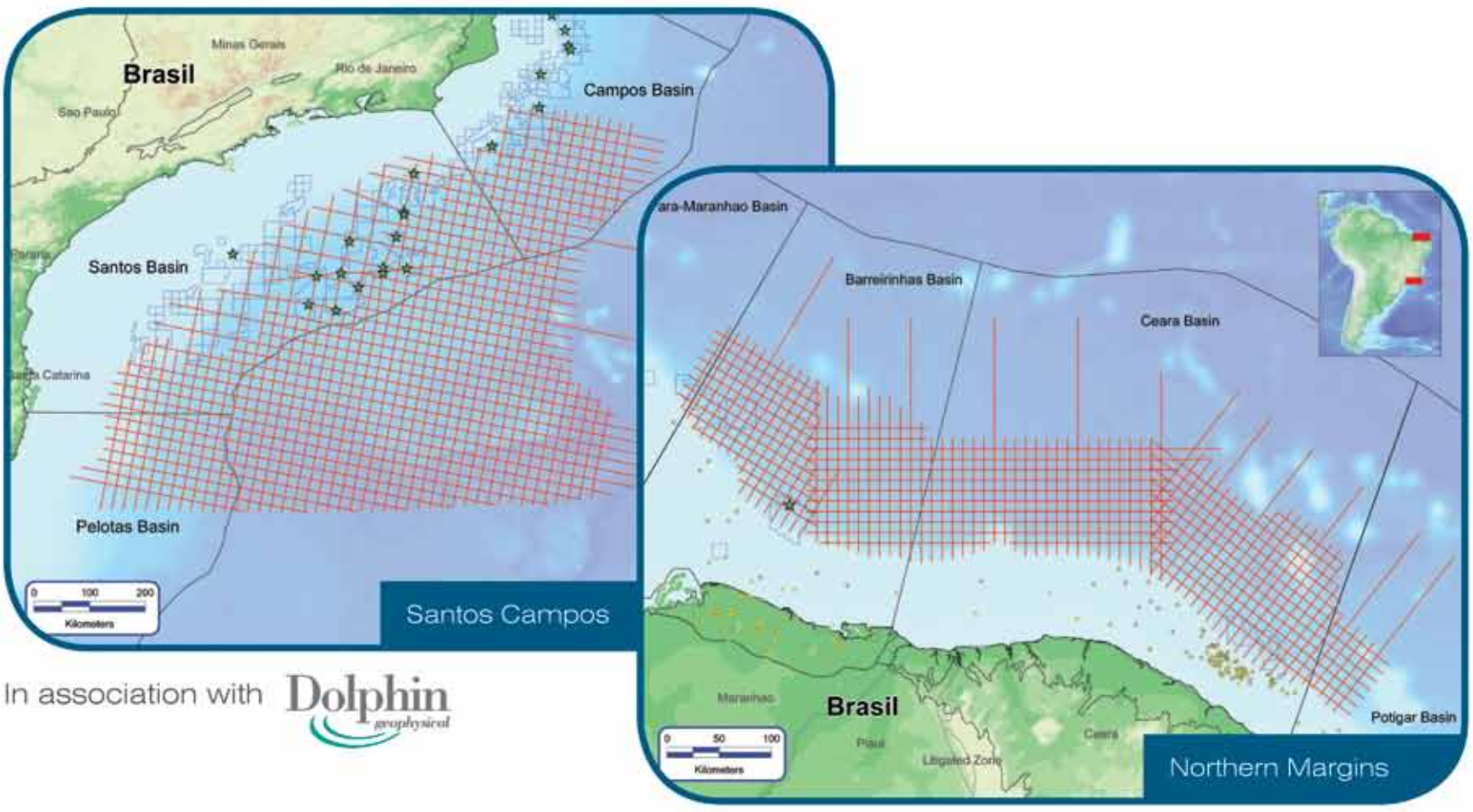
The SEAM model simulates a complex

See **3-D VSP**, page 28

New Acquisition

Solving the exploration puzzle...

Offshore Brazil



In association with Dolphin geophysical

Spectrum is planning two extensive, long-offset 2D Multi-Client surveys in Brazilian waters which are set to commence in October 2011.

The first two phases of the acquisition programs are planned to include 36,000 kilometers of new high quality seismic data in two exciting areas, the Santos Campos basins and the Northern Margins. The Multi-Client data will be acquired with the aim to better define deepwater prospectivity for upcoming license rounds. This data will be acquired and processed in different tranches to enable timely delivery.

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Last Chance Looms for Milan Pre-Registration Discounts

Online registration is available for this year's AAPG International Conference and Exhibition (ICE) – and the final deadline for registration discounts is coming fast.

Registering on or before Sept. 21 results in savings from onsite prices – in some cases of more than $100.

This year's conference will be held Oct. 23-26 in Milan, Italy.

Also available online are housing details and complete information on this year's technical program, which is built on the theme "Following Da Vinci's Footsteps to Future Energy Resources: Innovations From Outcrops to Assets."

ICE also will feature a large exhibition hall, featuring the latest in technologies, produces and services for geosciences.

General chair Jonathan Craig said the meeting will celebrate and aspire to the creative vision and spirit of innovation historically associated with Milan and the region – and the technical program is specifically designed for international audiences.

Technical program co-chair Pablo Flores, for example, pointed specifically to a session on Europe, North Africa and the Balkans that will feature the fields and petroleum systems of the Italian Peninsula, Sicily and the Adriatic Sea as being "particularly relevant" for European petroleum geology.

Flores also noted the papers on the Levant Basin, one of the Region's current hot areas of exploration, as well as a number of presentations dealing with unconventional resources.

Other "highly anticipated presentations," according to Flores and co-chair Keith Gerdes, include:

- Talks on carbonate giants of the world.
- Papers on the Brazilian and West African subsalt reservoirs and rifted margin exploration.
- A special focus on east Africa and Middle East geology and exploration.
- A look at the Levantine Basin.

The conference also will feature a number of special events, including:

- A plenary session based on the general theme of creativity in exploration.
- Three forums, centering on "The Business of Energy – Keys to Profitability," "New Technology Directions in Exploration and Production" and "Professional Issues for Professional Geologists."
- Special luncheons and lunchtime lectures.

To register or for more ICE details go online to aapg.org/milan2011.

3-D VSP

from page 26

geological environment; the model includes complex salt, grottoes, salt welds, sub-seismic resolution stratigraphic details and even an overturned set of sediments.

"For optimum survey design we recommend an iterative flow of ray trace modeling, 3-D finite difference synthetic data generation and imaging," Nutt said.

With recent advances in tool and source technology the acquisition time for 3-D VSPs has been significantly reduced.

"In complex geological environments," Nutt said, "better model building and calibration methods and more accurate imaging algorithms such as RTM will lead to successful 3-D VSP surveys."

Time for 4-D

Carbon sequestration is another area where VSP – especially in 4-D – can be useful, Nutt said.

Here, the goal is not enhancing data. Goals may include showing seismic changes over time or monitoring fluid fronts, he said.

Coal-fired power plants that inject carbon underground to sequester it need to track such information, he said.

Smaller targets, land ownership and other issues can make surface surveys less attractive, he said.

VSP leaves a much smaller surface footprint, he said.

Recent projects in this area have been undertaken in cooperation with national energy departments in the United States and Australia, Nutt said.

For an effective 4-D survey, "You have to try and repeat the same shot," perhaps a year later, Nutt said.

In some cases, a geophone array may be left downhole from the earlier survey.

The most crucial steps are the earliest – identifying a need, modeling, then designing a project, Nutt said.

New or additional data expected from the coverage may not justify the survey's cost. Logistics may make other projects unfeasible. Uncemented casing, for example, prevent effective coupling between the geophones and the formation, Nutt said.

Because VSP usually is performed in the most complex areas, processing results can take weeks.

"Processing time is shrinking ... it takes a lot of computing power," he said.

"VSP is not a generic solution to all seismic problems, but the industry is moving this way," he said. "There is a lot of investment by the service industry."

DL tours start in September

Ten Lecturers Set for New Speaking Season

By VERN STEFANIC, EXPLORER Managing Editor

AAPG's prestigious Distinguished Lecturer program, which offers audiences a chance to hear the latest in geoscience research, understanding and practical applications, kicks-off its new season with three speaking tours planned for September.

This year's DL program offers 10 speakers for North American tours, including this year's AAPG Ethics Lecturer.

The roster also includes AAPG Elected Editor **Stephen E. Laubach** – one of the three speakers who will offer talks in September.

Laubach will tour eastern North America cities Sept. 12-23, and western North America cities April 2-13. His lecture is "Structural Diagenesis, Resource Plays, The Highlands of Scotland and Curriculum Development."

The international DL slate has yet to be announced.

AAPG's Distinguished Lecture program, funded largely by the AAPG Foundation, is the Association's flagship initiative for spreading the latest in science, technology and professional information.

North America speakers typically take two tours during the season, one going to eastern locales and one to western locales. Each tour typically lasts about two weeks.

Last year's season featured eight domestic lecturers, and despite a season featuring many weather-related travel issues, still was able to make 77 talks to 8,255 people.

This year's roster – featuring experts from both the industry and academic worlds – once again will include talks that vary widely in subject content, from seismic detection of faults and fractures, to structural diagenesis related to the Highlands of Scotland, to climate models, to a provocative look at causes of mass extinctions on earth.

Some of the tours carry specific Foundation-funded purpose. This year they include:

❒ The J. Ben Carsey lecture, an annual domestic tour provided by contributions for J. Ben Carsey Jr., of Houston, in honor of his father, who served as AAPG president in 1967-68.

This year's Carsey lecturer is **Matthew J. Telfer**, of Border to Border Exploration, Austin, Texas. His first tour, of western North America cities, is Sept. 12-23; he will tour eastern North America Jan. 16-27.

Telfer's lecture is "Energy Trends of the Future."

❒ The Hass-Pratt Distinguished Lecturer, a domestic tour provided by contributions from the late Merrill W. Haas, in honor of famed geologist (and Haas' mentor) Wallace Pratt. The funding is granted for a lecture of an applied nature dealing with the exploration and discovery history of a field, or a subject having economic implications.

This year's Haas-Pratt speaker is **Dale A. Leckie**, chief geologist at Nexen Inc., Calgary, Canada, who previously served as a DL speaker in 1996.

Leckie will tour western North American cities from Sept. 26-Oct. 7, and eastern locales April 9-20. He offers two lectures:

- Anatomy of an Unconformity and Its Earliest Overlying Fill – The Basinwide Sub-Cretaceous Unconformity of Western Canada.
- A Multidisciplinary Approach to Understanding the Geology of the Athabasca Oil Sands – Second Largest Hydrocarbon Resource on Earth.

❒ The Allan P. Bennison Lecturer, which is an international speaker who makes a U.S. tour, funded by contributions from the late Allan Bennison, a long-time Tulsa geologist.

This year's Bennison lecturer is **Paul Wright**, principal consultant carbonate specialist at the BG Group, Cardiff, Wales. He will tour western North America Nov. 14-18, and eastern North America March 5-9.

He offers three lectures:

- Burial Corrosion as a Major Porosity

See **Lecturers**, page 32

More Petro. Less Physics.

Gas-in-Place Log Analysis traditionally requires:

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- ❑ LWD/wireline operations
- ❑ Data processing & corrections
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- ❑ Capillary pressure / presumptions
- ❑ Reservoir identification threshold
- ❑ Crossover and gas effect
- ❑ ΔlogR calculations
- ❑ $V_{shale,}$ $V_{clay,}$ $V_{organic/TOC, etc.}$
- ❑ Porosity calculations
- ❑ Modeling of multiple porosities
- ❑ Saturation model assumptions
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- ❑ LWD/wireline operations
- ❑ Reservoir interval threshold
- ❑ Crossover and gas effect
- ❑ ΔlogR calculations
- ❑ ± Porosity calculations, modeling
- ❑ Organic matter porosity model
- ❑ ± Image log runs and processing
- ❑ ± High-temperature correction(s)
- ❑ ± Fracture occurrence analysis
- ❑ ± Interpretation of fracture quality
- ❑ Wellsite coring & sampling
- ❑ Vitrinite microscopy
- ❑ ± RockEval, Leco TOC analyses
- ❑ ± Ion milling sample prep
- ❑ ± Advanced electron microscopy
- ❑ ± Interpreted pore character
- ❑ Simple, 1-D or full basin modeling
- ❑ Thermal maturity assessment
- ❑ ± Microseismic imaging program
- ❑ ± Thermal arrays & acquisition
- ❑ ± Anisotropy model, processing
- ❑ ± Imaged vs. inferred fractures
- ❑ ± Borehole strain data collection
- ❑ ± Rock strength model(s)
- ❑ ± Geomechanical modeling
- ❑ ± Inferred fracture density
- ❑ Modeled fracture probability

Now you can simply use this:

- ❑ Pore Type Log™

- **Know in advance** full-scale hydrocarbon recovery and pore-system trends controlling resource productivity.
- **Find** fractures, sweet spots with accuracy.
- **Know how dry**, how wet, or how liquid your hydrocarbons will be.

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DL Program: From Modest Roots to Global Impact

AAPG's Distinguished Lecture program was established in 1941 – it is the Association's oldest program and, arguably, most prestigious, annually reaching more than 300 groups around the world.

Distinguished Lecturers are unpaid volunteers who are recognized experts in their respective fields of industry and/or academia. Each speaker typically makes a two- or three-week tour to specific regions.

The program is funded largely by the AAPG Foundation.

To offset some of the travel expenses, however, host groups are responsible for sharing tour costs. Each sponsoring organization is responsible for local lodging, meals and local transportation while the lecturer is in their city.


GILES


MARTINSEN

The program has grown from a modest touring slate – and a $1,000 budget for the entire program – into a global science outreach that touches all continents.

The list of domestic DL speakers can be found on the AAPG website, along with their biographies and lecture abstracts.

The list of 2011-12 international Distinguished Lecturers is being finalized and will be announced in the next EXPLORER as well as on the DL website.

The new Distinguished Lecture Committee co-chairs are **Katherine Giles**, with New Mexico State University, Las Cruces, N.M.; and **Ole Martinsen**, with Statoil ASA in Bergen, Norway, and the 2011 winner of the AAPG Robert R. Berg Outstanding Research Award.

Both have been AAPG Distinguished Lecturers.

For more information about tours or to request a lecturer, contact Karen J. Dotts in the AAPG education department, at kdotts@aapg.org.

Lecturers
from page 30

Forming Process in Carbonates.

- Paleokarstic Reservoirs: Misconceptions and Paradoxes.
- How Do Shallow Water Limestones Really Accumulate?

Other Foundation-funded North America lecturers this season include:

❒ **Satinder Chopra**, with Arcis Corp., Calgary, Canada, and a frequent contributor to the EXPLORER's Geophysical Corner, is this year's AAPG/SEG Joint Lecturer. His tours are Oct. 3-7 (western North America) and Oct. 31-Nov. 4 (eastern North America).

His lecture is "Seismic Detection of Faults and Fractures."

❒ **Rodney H. Graham**, research associate, Cambridge, England. His tours will be Oct. 17-28 (eastern North America) and March 19-30 (western North America), and he offers two lectures:

- Exploration in Fold and Thrust Belts – A Personal Perspective.
- The French Alps – Classic Geology Re-Interpreted in the Light of Passive Margin Geology and Allocthonous Salt Tectonics.

❒ **Joe H.S. Macquaker**, associate professor in petroleum geology, Memorial University of Newfoundland, St. John's, Canada. His tours will be Oct. 3-14 (eastern North America) and Feb. 13-24 (western North America).

His lecture is "Are Shales Really That Dull? Shining Light Into Dark Places and the Effects of Opening Pandora's Box."

❒ **Joellen Russell**, professor, department of geosciences, University of Arizona, Tucson, Ariz. Her tours will be Nov. 7-11 and March 12-16 (eastern North America), and Jan. 3-13 (western North America), and she offers two lectures:

- The Once and Future Battles of Thor and the Midgard Serpent: The Antarctic Circumpolar Current and Glacial/Interglacial Climate.
- Orographic uplift as Global Thermostat: Orography, Winds and the Water Vapor Feedback in Climate Models.

❒ **Peter Ward**, professor in the departments of biology and earth and space sciences at the University of Washington, Seattle, and a prolific writer for both fields. His tours will be Feb. 27-March 2 (eastern North America) and March 5-9 (western North America).

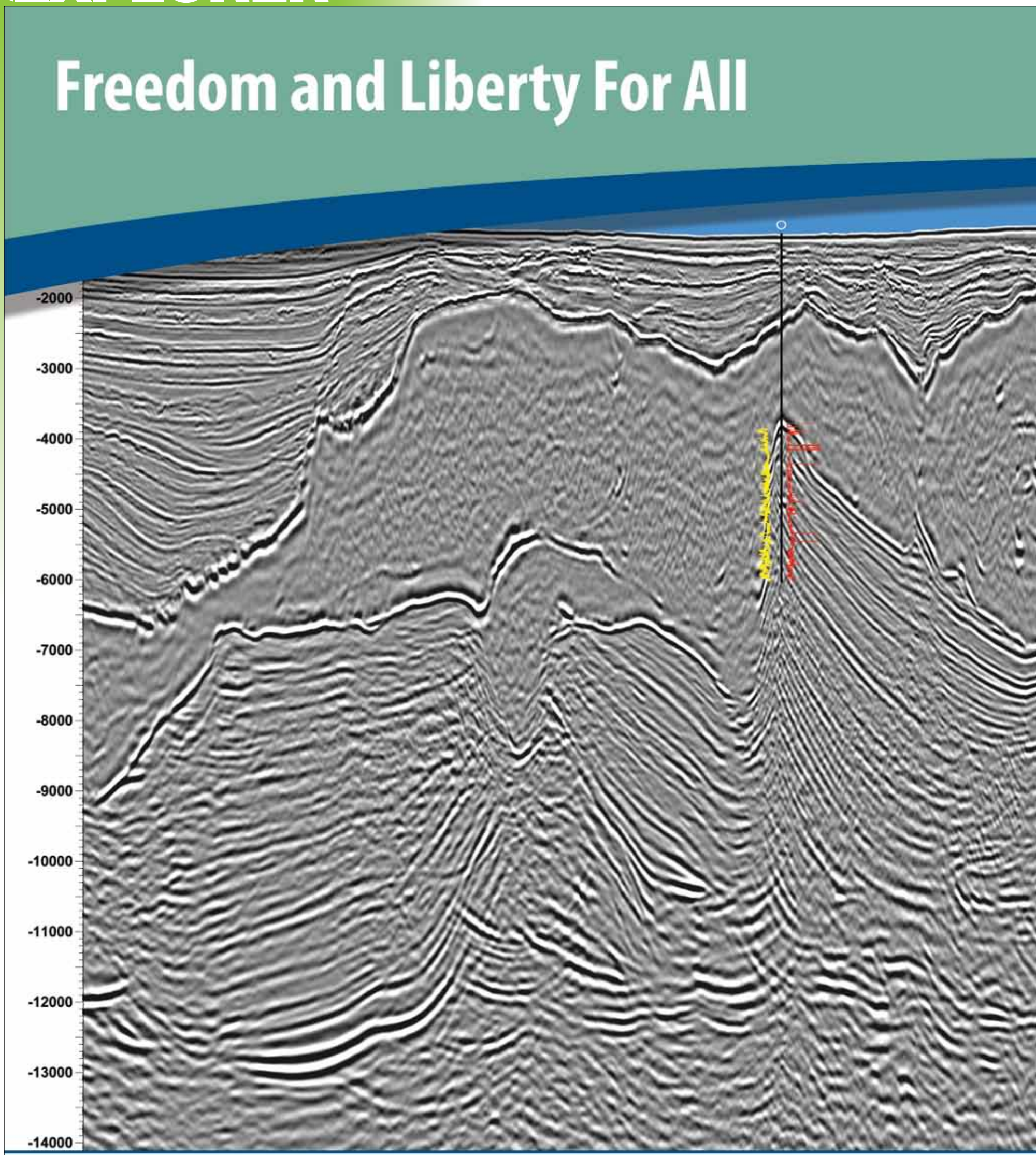
Ward's lecture is untitled at this time, but it will present a new context for mass extinctions on earth – focusing on non-extraterrestrial causes.

This year's AAPG Ethics Lecturer is **W.C. "Rusty" Riese**, retired geoscientist based in Houston, and a past vice president of AAPG. He is available to groups on an on-going basis as requested.

His lecture is "Oil Spills, Ethics and Society: How They Intersect and Where the Responsibilities Reside" (see July EXPLORER).

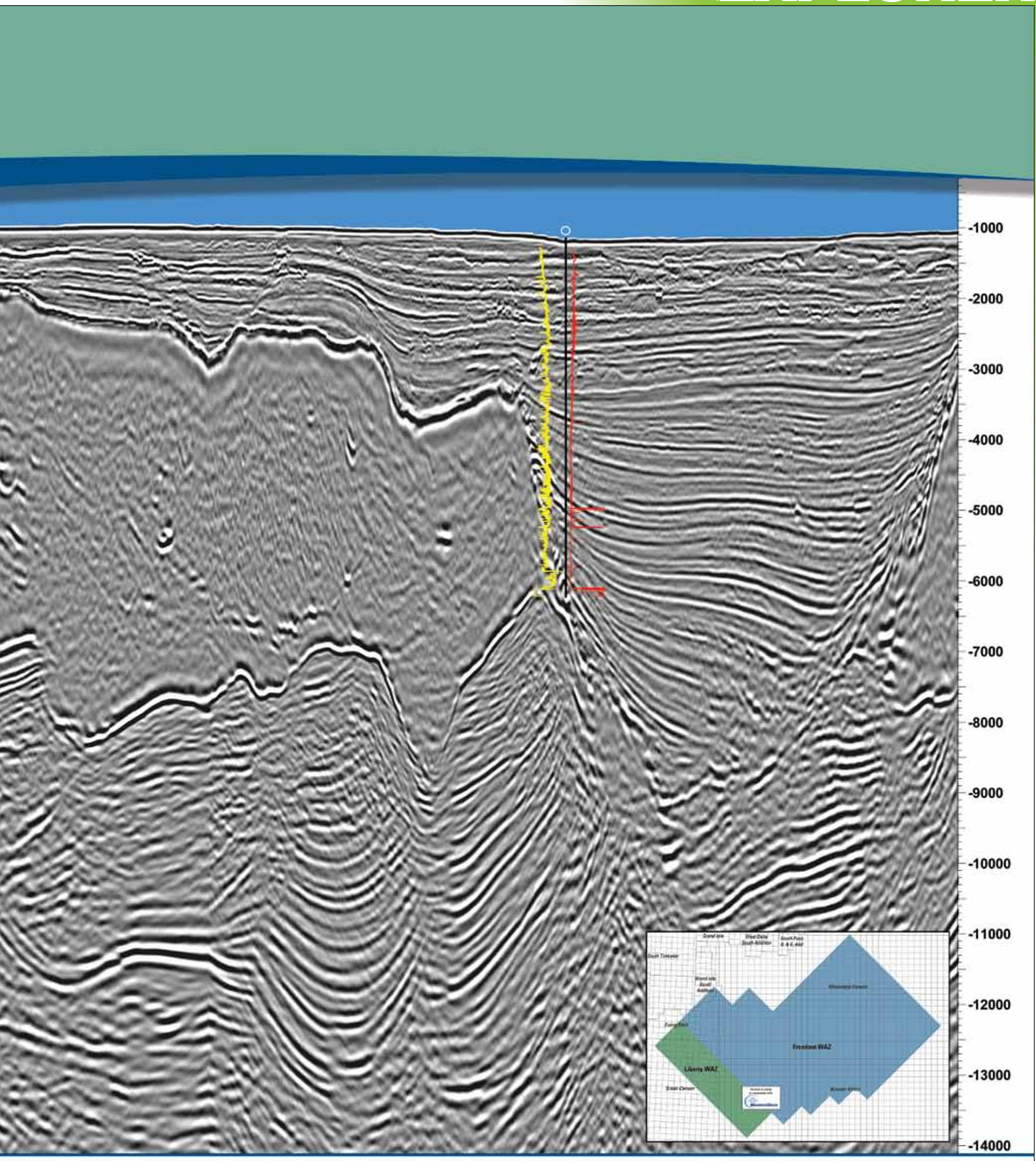
For abstract details and more tour and program information go to the AAPG website, at aapg.org/education/dist_lect/index.cfm.

Freedom and Liberty For All



TGS has completed the Freedom WAZ survey, with many outstanding subsalt imaging products available. The project comprises 714 blocks and includes the following features:

- Tied to best available well data (220 wells)
- True azimuth 3D SRME
- Tomography
- Anisotropic PSDM
  - Kirchhoff
  - WEM
  - RTM



Update notes remarkable changes

Louisiana Field Studies Volume Revived

By LOUISE S. DURHAM, EXPLORER Correspondent

In times past, many in the geologic community eagerly awaited each new volume of "Oil & Gas Fields of South Louisiana," assembled and published by the New Orleans Geological Society (NOGS).

The Society produced and published 10 of these volumes between 1960 and 1987.

Unfortunately, the effort then hit a wall when it became difficult to find an individual to assume the immense job of spearheading the projects. There's one heckuva lot of time and work involved in soliciting fields to include, ensuring that drafting meets a consistent standard, editing the field write-ups, coordinating the publishing and more.

Now for the good news.

It's back.

Oil & Gas Fields of South Louisiana 2010 is now available in a variety of formats: CD, B&W hard copy and color.

The hardcopy version of the new study tallies 318 pages. Field information includes geology, geophysics, maps, cross sections, logs, stratigraphy and paleontology. Seismic lines are included in some instances.

The idea for a new publication was presented to the NOGS board in 2005 but failed to take on wings.

What Happened?

In December 2009, AAPG and NOGS member Carlo Christina convened a meeting of the NOGS Board and past presidents to discuss approaches to re-energize the Society.

He proposed that the oil and gas field project was the appropriate path to take.

Christina and fellow AAPG and NOGS member Charles Corona volunteered to serve as co-chairmen of the sizeable undertaking; a steering committee was formed by early January 2010.

Deciding which of the almost innumerable fields to zero in on in this longtime producing region was task number one.

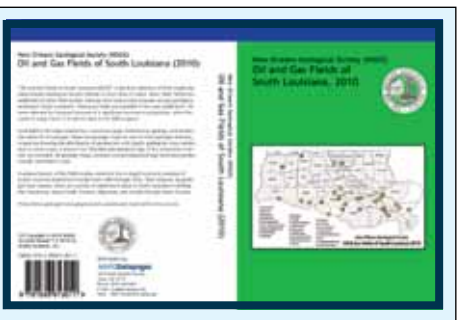
"The committee decided to target the top oil and gas producing fields, with an emphasis on their recent production history," Christina said. "Some of these top fields had been discovered since the last NOGS volume had been published.

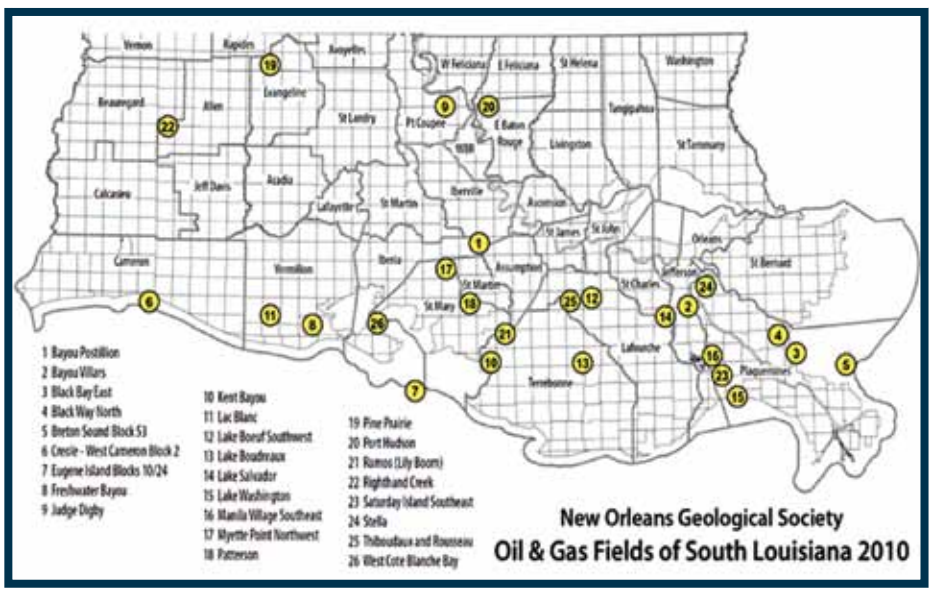
"However, it was recognized quite early in the process that many of the

See **Louisiana**, page 38

"Oil & Gas Fields of South Louisiana," a new book assembled and published by the New Orleans Geological Society, is available through the AAPG Bookstore for $85.

The book also can be purchased through the New Orleans Geological Society. Go to www.nogs.org for more information.






CHRISTINA


CORONA

Louisiana
from page 36

now-top producers were actually old fields that had been in steep decline or had even gone off production," he continued. "Recent activities had rejuvenated these fields.

"The theme of the volume is, 'What happened?'" Christina noted.

Forty fields were targeted up front for this in-depth exploration-economics analysis. Geologists associated with the fields were asked to contribute studies.

"We eventually found contributors for 26 fields," Corona said. "Once submitted, the process of editing and proofreading ensued, and all authors were asked for their final approval before the field studies were published."


PICOU

"If you own a field and think there's potential there, reading these field studies may well give you some insight on what to do."

The Big Picture

One of the notable features of the new publication is the fields all are producing via conventional production methods, according to NOGS and AAPG Honorary member Ed Picou, who serves on the steering committee for the project.

In other words, it documents that good things are happening in the oil patch in addition to the ubiquitous, often headline-making unconventional shale plays.

The new publication includes an extensive exploration update dubbed South Louisiana Exploration Results (1988-2010), penned by AAPG and NOGS member Paul Lawless.

"Paul has done an excellent job of capturing the drilling activity in the area during this time period," Picou said. "His analysis, trend by trend, is easy to read, and it's chock-full of information for anyone or company thinking of exploring in south Louisiana.

"It stresses failures as well as successes," he added.

Picou noted that it was primarily 3-D seismic that catapulted the increased production in the fields included in the study.

For example, Freshwater Bayou Field in Vermilion Parish was discovered in 1942 by Union Oil Company and Louisiana Land & Exploration. Cumulative production through 1993 was 133 Bcf and 1.36 MMbo.

In 1993, a deeper pool test in the existing field yielded a high profile gas discovery tabbed Freshwater Bayou (Deep), according to Kevin McMichael, who contributed the field study to the NOGS effort.

A proprietary 3-D program was shot in 1994 to acquire a more accurate structural interpretation and locate additional take-points for efficient reservoir depletion. Shallower reservoirs were eventually developed also, with seven additional wells drilled to accomplish full field development.

Cumulative production from the deep accumulation currently exceeds 585 Bcf and 7.9 MMb condensate.

"If you own a field and think there's potential there," Picou said, "reading these field studies may well give you some insight on what to do."

Louisiana Book Taps 26 Fields

It's a good day in the patch.

The New Orleans Geological Society has produced another "Oil & Gas Fields of South Louisiana" publication, following a more than 20-year hiatus owing to the difficulty of recruiting someone to take on this Arduous task.

The new 2010 volume, which is available through the AAPG Bookstore, is number 11 in the series that was ongoing between 1960 and 1987.

You can choose from three formats: CD, B&W hard copy or color hard copy.

The new edition includes 26 fields, ranging in age from Upper Miocene through the Cretaceous-age Tuscaloosa, and including:

- ✓ Bayou Postillion
- ✓ Bayou Villars
- ✓ Black Bay Complex (Black Bay East – Northern Block; Black Bay North – Eastern Extension)
- ✓ Breton Sound Block 53
- ✓ Creole – West Cameron Block 2
- ✓ Eugene Island Blocks 10/24
- ✓ Freshwater Bayou
- ✓ Judge Digby
- ✓ Kent Bayou (Etouffee)
- ✓ Lac Blanc (Lake Bœuf Southwest)
- ✓ Lake Boudreaux
- ✓ Lake Salvador
- ✓ Lake Washington
- ✓ Manila Village Southeast
- ✓ Myette Point Northwest
- ✓ Patterson
- ✓ Pine Prairie
- ✓ Port Hudson
- ✓ Ramos (Lily Boom)
- ✓ Righthand Creek
- ✓ Saturday Island Southeast
- ✓ Stella
- ✓ Thibodaux and Rousseau
- ✓ West Cote Blanche Bay

The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month's column deals with seafloor geomechanics.

Deep Thinking: 4C Proves Value on Seafloor

By BOB HARDAGE

Marine 4C seismic technology was developed to assist hydrocarbon exploration and development – but 4C data have important marine engineering applications that have not been exploited.


HARDAGE

The data discussed here illustrate how 4C data can be used to define geomechanical properties of a seafloor where engineers need to install production facilities.

Emphasis is placed here on determining bulk moduli and shear moduli of seafloor sediment. Bulk modulus, K, for a homogeneous medium is given by the equation:

$$K = [(V_P)^2 - (4/3)(V_S)^2]$$

Shear modulus, μ, for the same homogeneous material is defined by:

$$\mu = (V_S)^2.$$

In these expressions, V_P and V_S are, respectively, P-wave and S-wave velocities in seafloor sediment, and is the bulk density of a sediment sample.

* * *

Figure 1 presents shallow data windows of compressional (P-P) and converted-shear (P-SV) profiles across an area of 4C/3D data acquisition. Data analysis will be confined to the layer extending from the seafloor (labeled WB) to horizon H4 shown on the profiles.

Procedures used by the seismic data processor caused the water bottom interface WB to not be imaged on the P-SV profile.

The profile crosses a gas-invaded zone centered on crossline coordinate 200. P-P horizons H1 through H4 are interpreted to be depth-equivalent surface to P-SV horizons H1 through H4.

For simplicity, the bulk density term in the two equations above is assumed to have a constant value of 1.8 gm/cm^3 across the data analysis space.

Figure 2 displays seismic-derived V_P velocities and calculated bulk moduli across the shallowest seafloor layer (WB to H4), and seismic-derived V_S velocities and shear moduli values calculated for the layer are shown on figure 3.

Each elastic constant is shown as a 3-D surface and also in plan view. The position of the example profile (figure 1) is marked across each 3-D surface and illustrates the relationship between the gas-invaded zone seen on the P-P image and a normal fault that extends across much of the image area in the vicinity of crossline coordinate 200.

These figures show there is a one-to-one relationship between V_P and bulk modulus, and between V_S and shear modulus, for these high-porosity, near-seafloor, unconsolidated sediments.

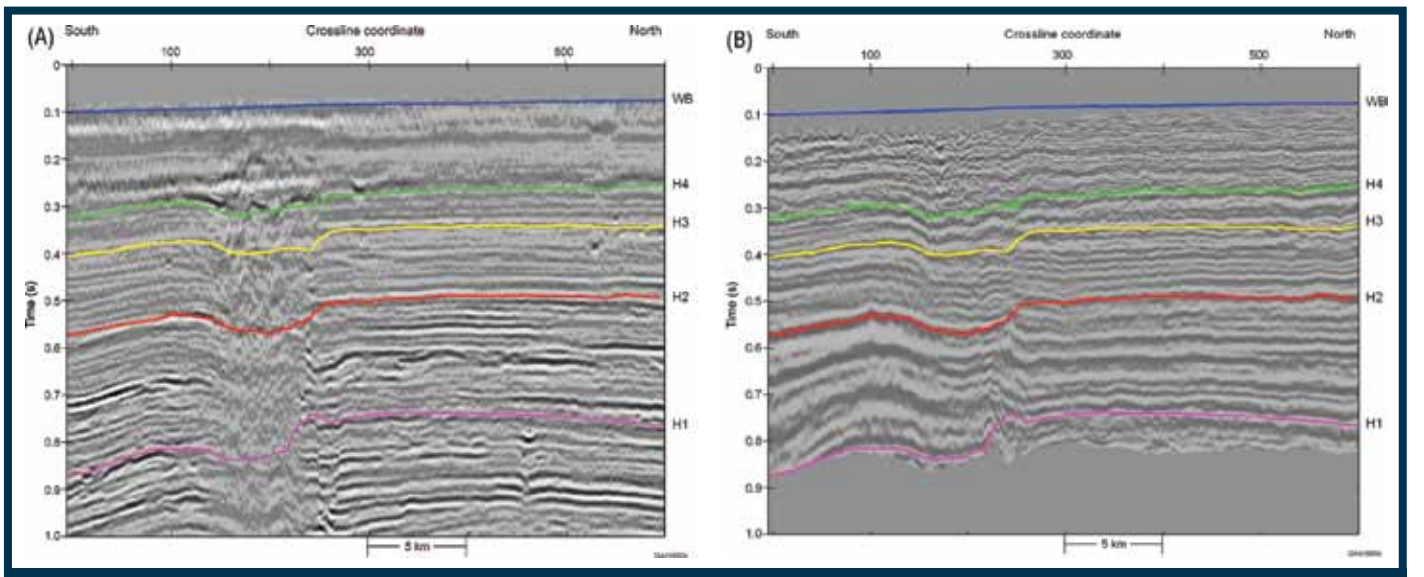


Figure 1 – (a) P-P profile and (b) P-SV profile traversing a 4C/3-D data-acquisition area in the Gulf of Mexico. Geomechanical properties will be evaluated across the layer bounded by the seafloor (horizon WB) and interpreted horizon H4. The P-SV data are time warped to P-P image-time coordinates.

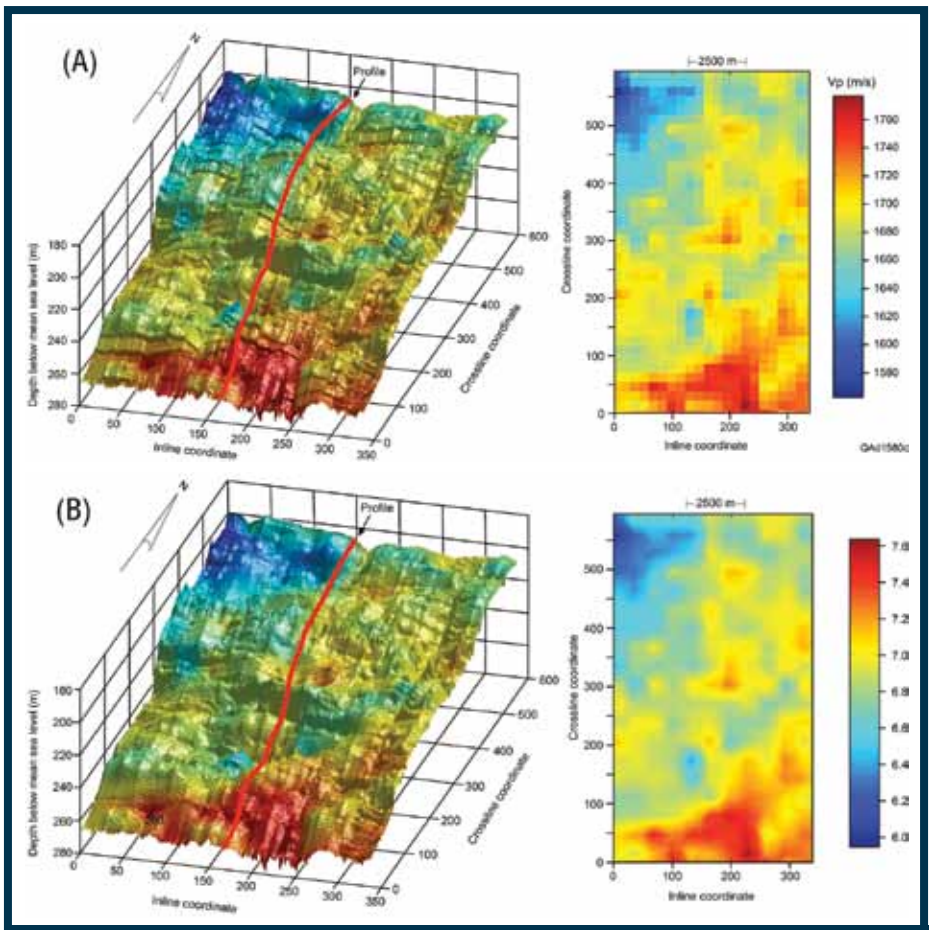


Figure 2 – (a) Seismic V_P interval velocity across seafloor layer WB to H4. (b) Seismic derived bulk modulus for the layer. Note the one-to-one relationship between V_P and bulk modulus.

Referring to equation 2, it is no surprise that V_S and μ have a one-to-one correlation. The one-to-one relationship between V_P and K is caused by the fact V_P is much larger than V_S within this shallowest seafloor layer.

In areas having hard seafloor sediment and for deeper layers where the V_P/V_S ratio has values appropriate for consolidated rocks, the V_S term of equation 1 will be significant, and there will not be such a close correlation between K and V_P.

The multicomponent seismic data application illustrated by this example can be done more rigorously by implementing a data-point by data-point inversion to create thin V_P and V_S layers that provide greater detail about zones of mechanical weakness.

* * *

The intent of this example is only to document that even simple velocity analyses of 4C data allow weak and strong areas to be recognized across a seafloor.

Of the two elastic moduli that are considered, shear modulus is particularly important for understanding where seafloor slumping is likely to occur.

Without 4C data, it is difficult to estimate shear moduli across large seafloor areas and to identify areas where seafloor slumping may be expected.

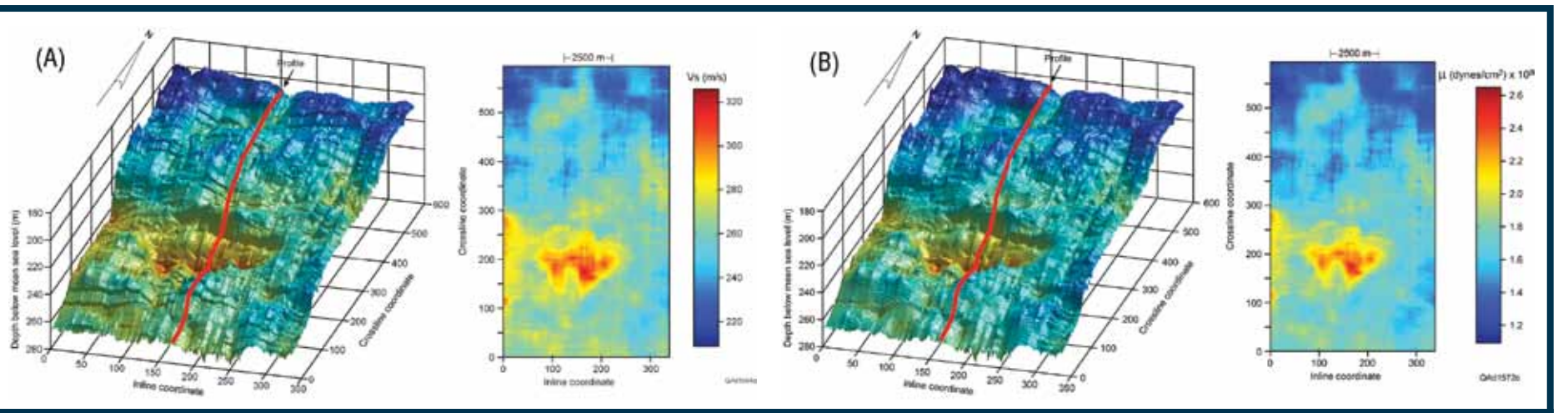


Figure 3 – (a) Seismic V_S interval velocity across seafloor layer WB to H4. (b) Seismic derived shear modulus for the layer. Note the one-to-one relationship between V_S and shear modulus.

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.

WASHINGTONWATCH

Profession Has a Lot at Stake in Budget Battle

By DAVID CURTISS, GEO-DC Director

Sitting at his Oval Office desk on Aug. 2, President Obama signed into law the compromise agreed to by the House of Representatives and Senate to lift the nation's debt ceiling and trim federal spending.

It was the end to a spectacle that had veteran political pundit Charlie Cook shaking his head.

"Right now, we are at a very, very low point – the worst I've seen since I moved to Washington in September 1972," Cook wrote in his July 29 column for *National Journal*. "Never in my memory have both parties and both ends of Pennsylvania Avenue appeared as dysfunctional as they do today. The stakes are so high and the performance is so utterly disappointing."


CURTISS

The oil and natural gas industry can make a significant contribution both to economic growth and jobs.

The American people seem to agree.

According to an Aug. 3 poll taken by Scott Rasmussen, only 22 percent of those adults polled approved of the compromise, probably because 58 percent did not believe it would result in any significant reduction in government spending.

And the next day he reported that 62 percent of American voters want to "replace the entire Congress."

* * *

But the election is more than a year off, and the job is not yet finished.

As legislators return from their August recess, they need to identify spending cuts over 10 years that equal $1.2 trillion. The specific proposal will be developed by a 12-person bipartisan, bicameral "super committee." And if the proposal passes committee, it will be subject to an up-or-down vote in both the House and the Senate.

Failure to pass a bill by Nov. 23 sets into motion a series of deep and painful cuts in discretionary, entitlement and defense spending that do not appeal to either party. Therein is strong incentive to develop and pass a consensus proposal.

Meanwhile, at the other end of Pennsylvania Avenue, weak economic growth and persistently high unemployment numbers have the president focused on job creation.

The oil and natural gas industry can make a significant contribution both to economic growth and jobs, as highlighted in a recent study by IHS Global Insight.

The role of U.S. independent oil and natural gas producers continues to grow. According to the study, independents:

- Drill nearly 94 percent of the wells in the United States.
- They operate most of the nation's marginal wells.
- Onshore they produce 65 percent of the nation's natural gas and nearly 45 percent of crude oil supplies.

In the study IHS assessed and forecasted "direct contributions of the onshore independents; indirect contributions from their supplier networks; and those contributions induced via spending of income by the direct and indirect employees" through 2020.

The study assessed upstream and mid- and downstream activities separately.

They found that upstream activities alone represented 2.1 million jobs in 2010, which equates to 1.6 percent of total U.S. jobs. And by 2020 jobs attributable to upstream activities were expected to grow to 2.6 million jobs, or 1.8 percent of U.S. jobs.

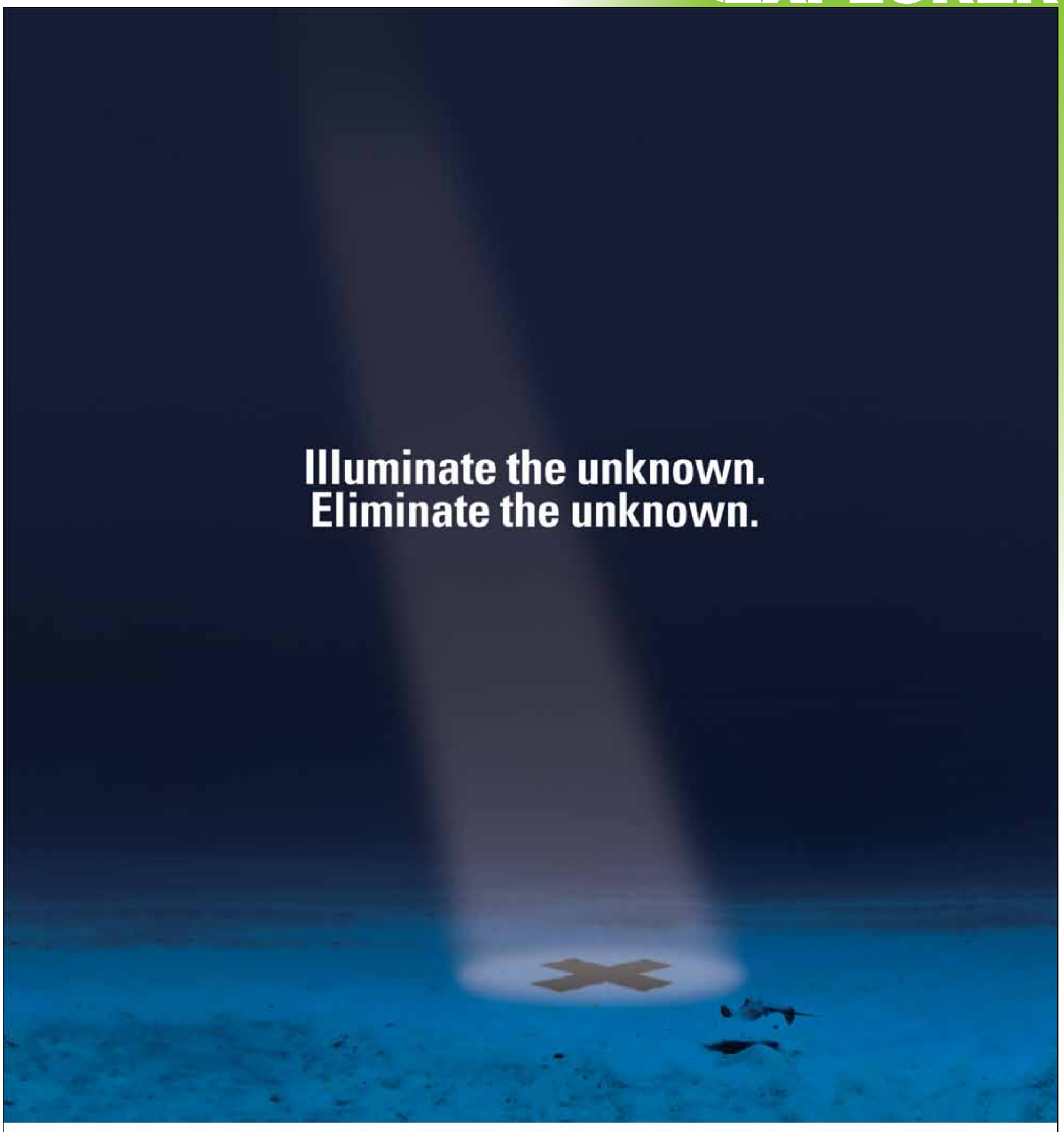
The economic contribution to the nation's Gross Domestic Product of upstream activities was $321 billion in 2010, and projected to be $467 billion in 2020. And this economic activity generated $69 billion in federal, state and local tax and royalty income in 2010 and $102 billion in 2020.

And as the Independent Petroleum Association of America explains in its 2009 Profile of Independent Producers, the firms engaged in this economic activity are the epitome of small business:

"[t]he median firm has been in business for 26 years and has median gross revenues of $7,851,000 and median net taxable income of $1,242,315. In addition, the median independent employs 11 full-time and three part-time employees."

But in order to realize the job gains and economic contribution of onshore oil and gas activities, lawmakers have to make wise policy choices.

See **Conundrum**, page 44



Deadline Near for Long Beach Abstracts

Abstracts continue to be accepted online for the 2012 AAPG Annual Convention and Exhibition (ACE), which will be held April 22-25 in Long Beach, Calif. – but the deadline for submissions arrives this month.

The deadline for submitting abstracts in Sept. 22.

The ACE theme is "Directing the Future of E&P – Starring Creative Ideas and New Technology," and the technical program will comprise 11 themes:

- Active Oil and Gas Fields: Development and Production – A look at state-of-the-art production, development geoscience and multidisciplinary studies.
- Emerging Frontiers – Recent discoveries, emerging exploration plays and technological breakthroughs.
- Siliclastics Reservoirs: Exploration and Characterization – Current trends and concepts of siliciclastic reservoir deposition and characterization.
- Carbonates and Evaporites: Exploration and Characterization – Current knowledge and research into carbonate reservoirs and evaporates.
- Unconventional Resources – Where we are and what's ahead for unconventional resources.
- Basin Analysis and Petroleum Systems – Concepts and ideas that cover the broader aspects of basin-scale petroleum systems and geo-histories.

- Alternative Energy – Exploration and use of energy outside conventional and unconventional oil and gas resources.
- Environmental and Energy Research – The relationship between environment and energy.
- Structural Geology and Neotectonics – State-of-the-art thinking and research into structural geology and tectonics.
- Geophysics and Seismology – Technology and recent advances in geophysics.
- Geoscience Principles and Applications – A focus on the application of various principles and technologies in natural resource E&P.
- AAPG and SEPM Student Poster sessions.

To submit an abstract, or for more information, go to aapg.org/longbeach2012.

Exhibition and sposorship opportunities also are available online.

Conundrum

from page 42

* * *

And that brings us back to Congress.

Two areas that we are watching as deliberation on federal spending begins are the Department of Energy's oil and natural gas technology R&D programs and suggested revisions to the tax code for oil and natural gas operators.

Terminating research programs and removing tax preferences could jeopardize the jobs and economic boost provided by domestic oil and natural gas development.

The FY2012 Energy and Water Appropriations bill that passed the House in July preserves the natural gas technologies program, although the bulk of the funding is to be used for methane hydrates research. Senate appropriators have yet to pass their bill through committee. These programs have regularly faced opposition from both Republican and Democrat administrations, and yet Congress has repeatedly restored the funding.

DOE's oil and natural gas technology development programs, together with the ultra-deepwater and unconventional resources program, provide essential technology development for independent oil and natural gas producers.

They also support the academic research community and fund graduate students – our future work force.

A recent study by Bloomberg Government looked at the impact on independents of repealing the three largest oil and gas tax preferences: expensing of intangible drilling costs, the domestic manufacturing tax deduction and percentage depletion.

Bloomberg found that the repeal would have minimal impact on the five large "majors" – but it would have reduced 2010 drilling activity, and thereby economic activity, of independents in the United States by more than 1,500 wells.

It also would disproportionately affect natural gas activity, because the United States gets more natural gas from domestic supplies than it does crude oil.

There are other policies, such as access to public lands, which are important to a comprehensive approach to energy and the economy. But R&D spending and tax preferences related to oil and natural gas face heavy scrutiny.

And GEO-DC will be monitoring and reporting as Congress and the president confront the nation's daunting fiscal and economic challenges in the months ahead.

"ProTracks" is a new ongoing feature of the EXPLORER, offering news and information pertinent to getting started or getting better in your career.

PROTRACKS

Next Step? A Good Résumé Is the Key to Open Doors

By COURTNEY CHADNEY, EXPLORER Correspondent

For this doctor, attendance is suggested but no appointment is necessary.

Students preparing for the professional world will get a chance to visit the "résumé doctor" at the upcoming AAPG/SEG Student Expo, Sept. 8-9, at the George R. Brown Convention Center in Houston, Texas.


NELSON

The "résumé doctor," Elizabeth Nelson of Kelly Scientific Resources, specializes in offering suggestions on how to cure any résumé. For the upcoming expo, she will be meeting with prospective young professionals one-on-one and will be looking to help with tips on how to rearrange sections, format, correct typos, avoid grammatical mistakes and make recommendations on what to include or leave out on their résumés.

Since the résumé is usually a "potential employers first impression of the applicant," she said, "it is very critical to get it right. Without a great résumé, there is little chance for an interview."

But what makes a good résumé?

"Employers want to see internships or research in the field, references from professors, high GPAs, at least a two-year commitment and an eagerness to learn," Nelson said.

The last of the two can be implied in the objective at the beginning of the résumé, or spoken during the interview.

Even if an applicant has all of the above, the way in which an applicant chooses to show it can be as equally important. And what once worked for your parents – or perhaps even an older sibling – may not work today.

"I have found that the functional résumé format, which is often used by older professionals, is not appropriate for new grads," Nelson said.

Nelson recommends instead, for the applicant to format their résumé in the following way:

- Objective.
- Education (including thesis, if appropriate).
- Selected Coursework.
- Field Camp Experience (if relevant).
- Skills.
- Chronological Work Experience.
- Awards and Associations.

If a student has publications, these should be included on a separate page.

Nelson emphasized that the "Objective," usually left out or lazily written, is one of the most critical parts of the résumé.

"One thing young professionals can do to stand out is to include something in the Objective that indicates he or she has something to offer the employer," Nelson said, "and not the other way around."

Some basic tips to keep in mind when writing the objective is to keep it a single sentence, not too narrowly focused, and to show how the employer will benefit from hiring the applicant.

> **"... The functional résumé format, which is often used by older professionals, is not appropriate for new grads."**

Specific Examples

Nelson offered this as an example of a bad Objective:

"Seeking exciting position in exploration geology, which will give me a chance to learn new skills and provide me with professional development."

Notice how the Objective is too narrow, Nelson observed, and does not explain what the applicant can offer the employer. Also, it seems to imply that this applicant is an individual in it for his or her own gain, and that their employment will be short-term.

Nelson also included a better Objective:

"Seeking a position with an oil and gas or oilfield service company, which will allow me to contribute my skills toward the achievement of my employer's goals, while enabling me to learn and grow within the company."

This one is broader, she said; the

Continued on next page

Fall Student Expo Starts Sept. 8

Company representatives and geoscience students will be networking together this month at the annual AAPG-SEG Student Expo, set Sept. 8-9 at the George R. Brown Convention Center in Houston.

Organizers are hoping the trend toward larger crowds and increased networking opportunities continue with this year's Expo. Last year's fall event was the largest to date, with 385 attendees plus representatives from 28 companies.

The Student Expo is designed to link geosciences students with industry recruiters. Students benefit from networking, sharing their résumé, presenting their research and having the opportunity to meet with several potential employers.

Companies get a cost-effective way to recruit from a diverse and talented student population.

Activities at the two-day event include:

- Job interviews.
- Open poster sessions on geology and geophysics.
- Company-sponsored Icebreaker reception.
- Field trip and short course option.

Students should submit their résumés and poster abstracts by Aug. 29.

To register or for more information on the program and travel grants that are available, go to students.aapg.org/expo/index.cfm.

Jill Geologist

OBJECTIVE
As a current graduate, I am seeking a position in the oil and gas industry that will allow me to contribute my skills toward the achievement of my employer's goals, while enabling me to learn and grow within the company.

EDUCATION
Bachelor of Science, Geology (May 2011)
Real Fancy University

Selected courses completed in major:
- Physical geology
- Mineralogy
- Petrography
- Historical geology
- Optical mineralogy
- Geologic field methods
- Structural geology
- Stratigraphy
- Introduction to geophysics
- Geophysical prospecting
- Sequence stratigraphy
- Field camp/Colorado, Utah

SKILLS Computer skills:
UNIX systems, PC Windows (Word, PowerPoint, Excel, Internet), some programming in VB

EMPLOYMENT
5/2008 – 8/2008 Student co-op - Mega Oil Company
- Learned interpretation techniques of deepwater seismic data.

5/2007 – 8/2007 Local Public Library, Springfield
Librarian Assistant
- Reshelved books.
- Checked out books.
- Performed basic customer service.

AWARDS
Outstanding Sophomore Award (academic excellence award)
Mega Oil Company Scholarship 2008-2010
Estwing Award (academic achievement, excellence in field geology) 2008-2009

MEMBERSHIPS
Currently a student member in the American Association of Petroleum Geologists (AAPG)
Local Geological Society (LGS)

REFERENCES
Provided upon request

Not all résumés are equal: This is an example of an effective way to present yourself.

Continued from previous page

applicant demonstrates he wants to better the employer with his or her skills, and implies he or she is a team player that hopes to be with the company long term.

Following the Objective, the Education section should be short. High School education should not be included. The G.P.A. should only be included if it is a 3.0 or higher. The applicant's thesis topic also can be listed here, if it is relevant to the job he or she is applying for.

If the applicant has not yet graduated, their expected graduation should be listed.

For the Coursework section, only courses that would be relevant to the job should be listed. That same rule applies for the Skills part of the résumé.

List relevant lab and computer skills, including programs and software used. The applicant can stand out here by showing that he or she has experience with some of the same lab or computer equipment that might be used in their future profession.

Nelson said a common mistake most students make when compiling this portion of their résumé is to forget to include their field camp experience.

"I can't tell how many times I have suggested this and the person says, 'Oh, I didn't think of that,'" she commented.

Nelson also explained how, in her opinion, nine times out of 10, the field camp experience is usually something the employer would be excited to hear about.

It is "often what the candidate has in common with the hiring manager," she said.

Small Things, Big Deals

Nelson advises that in the Work Experience section, the dates should always be listed in the left hand margin. The company's name and location should be included, and work title and job duties should be listed. Job duties, however, should be bulleted and should be briefly described using action words.

It also is important to remember that during your interview, the applicant will most likely be asked about the content provided on their résumé. "Only put skills and work experiences that you can intelligently talk about," Nelson said.

At the end of the résumé the applicant should also always note references are available on request – but it never hurts to include a separate sheet with references, listing three references with their names, company name, address and phone number. Professional references, like professors or former employers, are always preferred.

Other important things to remember:

- Typically, résumés should avoid ornate fonts and be Word or PDF files.

"Use Microsoft sans serif fonts, like Arial or Helvetica," Nelson said.

- Keep the font size between 10 and 14; no smaller and no bigger.
- Italics and underlining can cause problems, Nelson explained, so "use bold type or all capital letters to emphasize words or phrases instead." Fancy graphics should also be avoided, like shadows or 3-D effects on bullets.
- Do not include a picture.

Also, avoid using the narrative style instead of bullet points; mixing fonts; using the first person "I"; or putting work experience like retail or other non-relevant job history before education and skills.

Finally, remember that entry-level résumés should be kept to one page – and the résumé style or content should not be compromised if this page length cannot be achieved.

For more information on how you can see the résumé doctor at the upcoming AAPG/SEG Student Expo, visit www.studentexpo.info.

HISTORICAL HIGHLIGHTS

Creative Thinking Led to Mahakam Success

By BERNARD C. DUVAL

Despite the fact that exploration in the Mahakam Delta started more than 40 years ago, with large discoveries made in the mid-1970s, plans are being considered to develop and redevelop several gas fields of the area.

Total is the operator of the Mahakam Production Sharing Contract, with Inpex of Japan as partners, each with a 50 percent interest. These new projects will allow Pertamina, the national company, and the co-venturers to keep delivering most of the feedstock to the Bontang liquefied natural gas plant at the present level of 2.6 billion cubic feet per day.

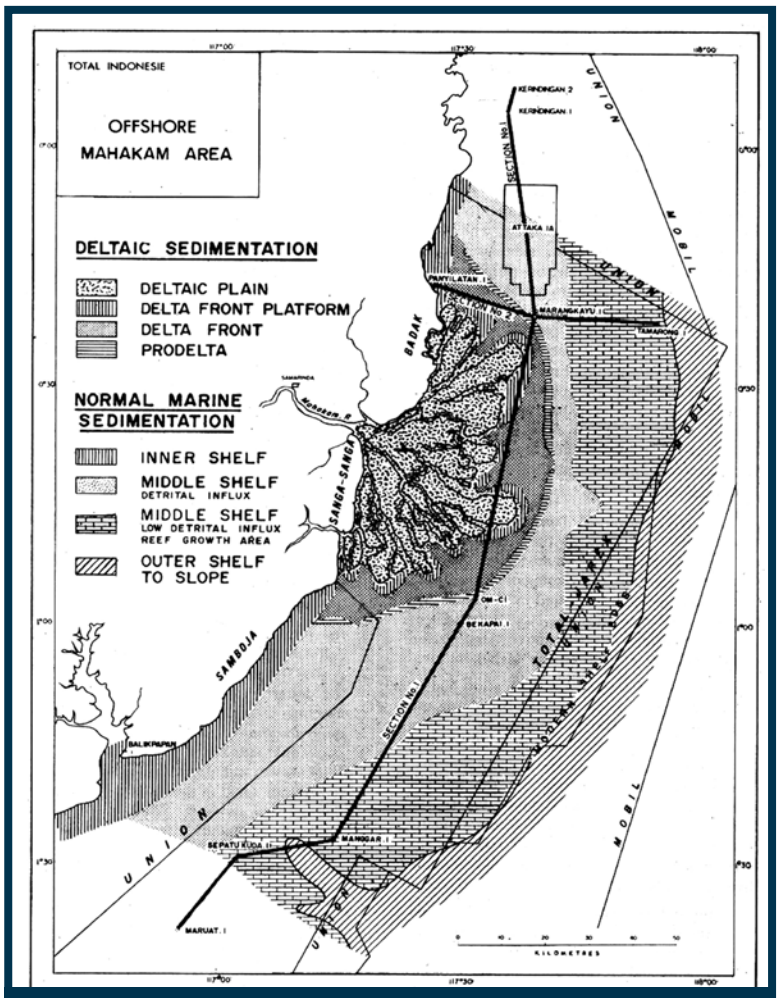
In fact, the success, which is far from complete, has developed through successive phases, involving several teams of explorers.

It sends, we think, important messages about the "discovery process," illustrating the combination of "hard" and "soft" skills needed in our profession to ensure success.

Only one well had been drilled on the Mahakam block by the Japanese operator (then named Japex Indonesia) when a farmout offer was made to Total in 1970, convincing Pierre Germes, a dynamic vice president for Total, to progress.

The Kutei Basin, located in the East of Kalimantan (the Indonesian part of the island of Borneo), is one of the oldest oil provinces of the world, with the first discovery made in 1897! It contains the delta of the Mahakam River, where no

Continued on next page



Depositional environments in the Mahakam area. All offshore wells drilled until 1973 are located on the two cross-lines.

AAPG Honorary Member Bernard C. Duval spent most of his career with Total, with overseas assignments in Libya, Venezuela and Canada. He has been senior vice president of exploration for Total and is now associate professor at the IFP School of France, and an international consultant. He also served a season as the AAPG Foundation's Allan Bennison Distinguished Lecturer.

DUVAL

Main fields of the Mahakam Delta province (oil in green, gas in red).

Continued from previous page

activity took place until World War II, when Indonesia opened the country to PSCs and related investments by foreign companies.

The farmout agreement was successfully concluded in Tokyo during the summer of 1970 (B.C. Duval and J. Picard were the French negotiators, with J.B. Keller for the operating agreement).

Perseverance: Two Giants at Stake

A simple idea at the time was that the thick tertiary sediments of the delta would provide the ingredients of future discoveries toward the almost unexplored coastal area, and also that the tectonics of narrow, elongated, steep anticlines, which provided traps for the existing onshore fields, would evolve into simpler and larger structures – conditions more in line with the economics of offshore operations.

Furthermore, the first offshore oil discovery at Attaka (by Union Oil and Japex) was in progress that same summer.

An active seismic program followed immediately, under a team led by P. Magnier and comprising, among others, J. Gérard and R. Elie. Six wells were drilled, all dry except one, with gas. However gas was not a desired commodity at that time and no follow-up was considered.

One last-chance-well remained in the 1972 budget before the irremediable relinquishment, and the critical question of its location had to be addressed.

The team's attention was then focused on the first well drilled before the farmout was effective. J. Gérard's seismic interpretation showed clearly that a significant updip part of the structure remained untested.

The proposal to make the last attempt on this target met with strong opposition from the head office, which was reluctant to the disputable idea of once again drilling a "dry" structure. However the plan received a committed support from C. de Lapparent, regional manager for southeast Asia, and was finally approved.

The Bekapai well was drilled and tested at rates of some 20,000 bopd – a major discovery allowing to re-open the whole strategy in the area.

While appraisal plans were being made, the attention turned to the block's onshore part, where the only existing seismic had been shot along the meandering rivers, showing nothing below one second – and, if any, an eastward monoclinal configuration.

The area in question was just south and on trend with the Badak gas field, recently found by Huffington. A more adapted regular seismic coverage was proposed over a marshy mangrove terrain where operations could be carried out only by foot under extreme conditions.

Again, the team could convince C. de Lapparent during a visit to support this expensive program.

Our French contractor CGG met the challenge brilliantly and carried out the campaign. The processing was made in Singapore, and the sections were quickly sent to Jakarta for interpretation.

A westward reversal was immediately identified below two seconds and a magnificent anticline, on trend with Badak, mapped by M. Lavieuville, a CGG geophysicist (later with Total).

A 300-meter, multi-pay hydrocarbon column was found with the first well, this one billion barrel Handil Field, together with Bekapai, definitely establishing the bright future of the Mahakam Delta PSC, with production in excess of 200,000 bopd.

The important phase of appraisal and development was thereafter supervised by M. de Matharel and J-M. Fonck, and another oil and gas discovery was made on Tambora.

See **Mahakam**, next page

Historical Highlights is an ongoing EXPLORER series that celebrates the "eureka" moments of petroleum geology, the rise of key concepts, the discoveries that made a difference, the perseverance and ingenuity of our colleagues – and/or their luck! – through stories that emphasize the anecdotes, the good yarns and the human interest side of our E&P profession.

If you have such a story – and who doesn't? – and you'd like to share it with your fellow AAPG members, contact Hans Krause at historical.highlights@yahoo.com.

Steps to Success

One can find in the Mahakam story the main ingredients for success in exploration – which makes it a good case history for educational purpose (and is indeed used as such by the author of this article).

To summarize, the main drivers of the "Discovery Process" as exemplified in the Mahakam Delta are:

- The need to take a regional perspective, constantly requestioning the petroleum system and field model (e.g. getting out of the structural paradigm: Peciko, Tunu, Stupa).
- Out-of-the-box thinking with a relativistic view of past "dry" wells and a creative "what if" approach (e.g. Bekapai dilemma).
- Well-focused application of technological advances (e.g. Tunu's new 3-D).

And on the "soft skill" side:

- Tenacity and the power of conviction (e.g. Bekapai, Handil).
- A fundamental optimism and "calculated" vision that the improbable can – and does – happen.
- A strong team spirit – the numerous names quoted in this article bear witness to a continuous passing of the torch between successive groups of explorers.
- A proactive management that really wants to drill exploration wells!

– BERNARD DUVAL

Early steps in the process: Seismic crew at work in the swamp.

Mahakam

from previous page

Proactive Strategy and Innovation

The next step in exploration took place in the early 1980s, with M. Bordenave, J-F. Mugniot and B. Loiret. During that period major gas discoveries were made – particularly Tunu, located along the Attaka-Bekapai structural trend – but it was not before some time later that gas definitely would become a priority, driven by the rapidly expanding regional gas market.

The subtle structural relief of the remaining objectives made appraisal difficult, and drilling from well to well had to be relied upon to complete the picture.

During that period, as more well data became available, critical progress also was made regarding seismic sequence interpretation and the stratigraphic framework of the area, paving the way to a better understanding of the petroleum geology.

Then in the mid-1980s came the confirmation of a strong gas demand – and with rapidly declining oil production, the future of Total's Indonesian operations had to be seriously reconsidered. It was clear that such a future depended mostly on exploration and finding new stratigraphic targets for lack of prominent undrilled structures.

A special group of explorers was established (G. Choppin de Janvry, Y. Grosjean, J-L. Piazza, B. Loiret, called "The Three Musketeers" from the famous French novel, who were actually four ...) in order to facilitate and organize the upcoming programs. With a synthetic mindset approach they updated the regional model of petroleum system – and came up with a prospect based on the possible shaling-out of the main producing sands of the area over a subtle nose well exposed to the main kitchen, updip from a gas well (Peciko-1) drilled by the previous team.

The new well (NW Peciko-1) turned out to be a major discovery (about 6 Tcf), and pressure studies indicated a strong hydrodynamic trapping component linked to overpressures in the adjacent prograding slope shales of the delta.

The new model – established by Y. Grosjean and applied in turn to Tunu, thus complementing the stratigraphic trapping conditions – helped improve exploration efficiency and increase reserves dramatically: more Bcf/well, optimized locations, downdip extensions etc. (M. Léo, S. Haddad, P. Zaugg)

One possible obstacle to commerciality, however, was still the nature of the reservoirs – numerous very thin sands (a few meters maximum), composed in great part of mouth bars, but their continuity and connectivity could be sustained by field observations made by the regretted G. Allen, and long duration tests, before starting full-scale development.

The interest turned also to the "external" trend, where 3-D helped define several small relief fault-associated closures near the shelf margin (Sisi Nubi fields).

They have been part of another development, which is still in progress today.

There's Always a Future

The successful development of the two giant gas fields continues to this day, through successive phases of infill drilling with progressively diminishing spacing.

Several additional developments are in progress at this time, including the "Tunu shallow" project, which could bring significant additional reserves. Shallow gas sands had been bypassed by most previous wells because the cluster setup only allowed a wide-sparse control of the subsurface at these depths (with involvement of P. Zaugg, R. Groot, N. Langevin, L. Boisse, F. Bertini and B. Mathis).

The related accumulations could be perfectly identified thanks to a recent successful heavy 3-D program (2008-09) by CGGVeritas on swamp and shallow water.

A footnote: The Peciko model was successfully applied again in the late 1990s to a prospect named Stupa (T. Rosaz, J-C. Heidman), located in the smaller delta of the South Mahakam – which together with other small fields, will soon be tied to an existing platform.

(Author's note: Many thanks to P. Magnier, J. Gérard, Y. Grosjean, J-F. Mugniot and P. Zaugg for their help in piecing together the sequence of events.)

FOUNDATIONUPDATE

Foundation, Association Differentiated

BY NATALIE ADAMS, AAPG Foundation Manager

AAPG, as defined by the Internal Revenue Code, is a 501(c)6, and the AAPG Foundation is a 501(c)3.

There is a clear delineation between these two types of organizations, and it's important for our constituents to know the difference. So, here's a quick refresher course:

Contributions to AAPG are not tax-deductible, but contributions to the Foundation are.

The brief reason why is that the Foundation supports the general public, whereas the support of the Association goes to its members. The Foundation was created to lend support to the Association insomuch that its support benefits the general public.

Clearly, the purposes between the two groups seem very similar, but the differences are there. Many of the services that the Association offers are fundable by the Foundation, but those that strictly serve or benefit the AAPG members are not.

If you have any questions about a contribution that you are considering making, please call the Foundation to discuss.

The **purposes of AAPG** as stated in the constitution are:

- To advance the science of geology, especially as it relates to petroleum, natural gas, other subsurface fluids and mineral resources.
- To promote the technology of exploring for, finding and producing these materials in an economically and environmentally sound manner.
- To foster the spirit of scientific research throughout its membership.
- To disseminate information relating to the geology and the associated technology of petroleum, natural gas, other subsurface fluids and mineral resources.
- To inspire and maintain a high standard of professional conduct on the part of its members.
- To provide the public with means to recognize adequately trained and professionally responsible geologists.
- To advance the professional well-being of its members.

The **purposes and objectives of the AAPG Foundation** as stated in the bylaws are:

- To establish a permanent entity to conduct educational, charitable and scientific activities related to or allied with the field of geology.
- To make contributions to any organization described in Section 501(c)3 of the Internal Revenue Code of 1954, with the exception of organizations testing for public safety.
- To conduct research – both directly and through the promotion, assistance, encouragement, support and furtherance of studies and research – in the field of geology and in sciences related thereto.
- To disseminate information relating to geology and related fields through lectures, seminars, publications, educational courses, teaching aids and by other means and materials.
- To carry on programs of continuing education in geology and related studies.
- To assist in career guidance to persons interested in the field of geology or related fields.
- To assist public and private schools (elementary and secondary) and colleges, universities and technical schools in teaching and education in the field of geology and related fields.
- To provide scholarships, prizes, awards, gifts, educational loans and other kinds of support to assist or reward persons engaged in the study of and/or pursuit of the science of geology or related fields.
- To establish fellowships or "chairs" in colleges and universities in order to further education and knowledge in the field of geology and related fields.
- To work with and support (including contributions from the corporation) other organizations with similar objectives that are in themselves tax-exempt educational or scientific organizations under the Internal Revenue Code.
- To support activities of other organizations with financial assistance so long as the activity supported is one in which the corporation, as an organization described in Section 501(c)3 of the Internal Revenue Code of 1954, may engage and the financial assistance is so utilized.

The AAPG Foundation annual report is available online at the Foundation website.

* * *

In other news, **Stephen Laubach**, AAPG's current Elected Editor, has joined the Foundation Trustee Associates.

He is a senior research scientist at the University of Texas Jackson School of Geosciences in Austin, Texas.

Also, the 34th annual Trustee Associates meeting will be held Sept. 7-11 in Lake Tahoe, Calif., under the theme of "Reaching New Heights."

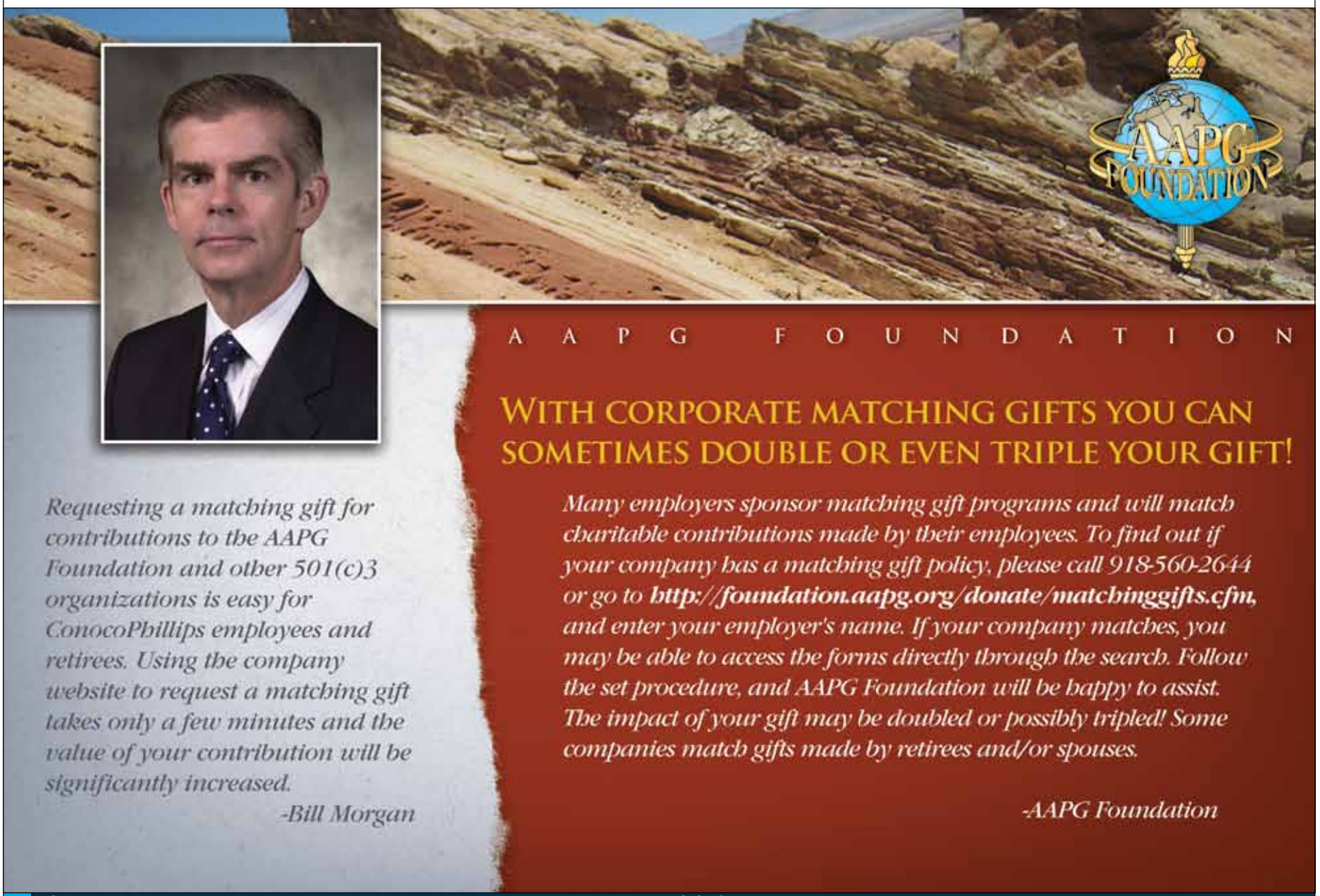
For information on the event or on joining the Trustee Associates, visit foundation.aapg.org/trusteeassociates.cfm.

* * *

Our "Meeting Challenges … Assuring Success" finance campaign has raised $34,974,136 as of early August, and will continue through 2011 with a goal of raising $35 million.

For those who are yet to pay their AAPG dues, this message: Please consider adding a contribution to the AAPG Foundation in your payment.

Or perhaps you are committed to supporting the Foundation's mission through a bequest or other planned gift. Either way, you can donate or get additional information online at foundation.aapg.org; or you can call with questions or credit card donations to 1-888-945-2274, ext. 644.



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The names that appear here are of those who have made donations to the AAPG Foundation in the past month – predominately through adding some additional monies on their annual dues statement.

To these people, and to those who have generously made donations in the past, we sincerely thank you.

With your gifts, the AAPG Foundation will continue its stewardship for the betterment of the science and the profession of petroleum geology.

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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. For Canadian Region news, contact: Carol McGowen, AAPG's Regions and Sections manager, at 1-918-560-9403; or e-mail to cmcgowen@aapg.org. This month's column is written by Ross Clark, vice president of Kallisto Energy, Calgary, Canada.

Canada: Robust Resource-Wise, Frail Market-Wise

By ROSS CLARK, AAPG Canada Region President

While energy demand in the developed world seems somewhat stabilized, energy demand from emerging economies in the Asia Pacific Region increases year after year.

All forms of energy will be needed to fuel this economic growth, from oil sands to oil and gas liquids, which are found abundantly in the western Canadian sedimentary basin.

And in eastern Canadian provinces of New Brunswick and Quebec, companies like Junex, Southwestern Energy and Apache are evaluating frontier basins for unconventional resource potential.

Despite Canada's abundant conventional oil and gas resources, unconventional resources dominate the country's total reserves estimates.

Ranked the second largest country in the world by area, Canada is the third largest producer of natural gas and sixth largest producer of crude oil. With the abundant supply of new energy sources that are now possible to exploit via horizontal drilling and multi-stage fracking completion techniques, it's not surprising that Canada is one of the few developed nations that is a net exporter of energy.

The reserves associated with the Athabasca oil sands alone make Canada the country with the world's second largest oil resource base (178.1 bbl, EIA 2010). Adding to this, Canada's energy potential from developed and emerging unconventional gas resources continues to expand due to large capital expenditures for both drilling and land acquisition.

Combine these unconventional gas resources with the ever-growing investment in light oil produced from tight unconventional projects, and Canada will remain a net exporter of energy into the foreseeable future.

Graphic courtesy of Apache Corp.

Artist's rendering of the proposed Kitimat LNG facility in British Columbia, Canada.

Abundant resources, however, do not necessarily guarantee optimal market conditions.

As was the case prior to the construction of the Northern Border Pipeline to export Canadian gas to Chicago and the greater North American market in 1998, Canada's hydrocarbon resources are becoming stranded by reduced demand and significant price discounts resulting from the recently saturated U.S. market.

Canadian Unconventional Activity

A quick look at activity across the spectrum of Canadian resource plays shows an industry engaged in managing and exploiting the abundant oil and gas remaining to be produced and found.

In a recent announcement Imperial Oil stated that the first phase of its multi-billion-dollar Kearl oil sands project in northeast Alberta is expected to start-up in late 2012. When completed, production is projected to reach upwards of 110,000 barrels of bitumen per day from 5.5 billion barrels of established reserves (ERCB, 2011).

On the land sale front, the province of Alberta has taken in lease payments exceeding $2 billion CAD in the first seven months of 2011 – revenue largely generated from leasing mineral rights in the Devonian Duvernay shale.

For example, Talisman Energy spent $510 million CAD in June for Duvernay shale gas rights, bringing its total Canadian land holdings to 360,000 acres.

Early movers have begun de-risking the play, having drilled a few horizontal multi-stage fractured wells in the Kaybob area of north central Alberta. Initial results of two-five mmcfg/d and 75 bbls/Mcf of natural gas liquids demonstrate the potential of this play. Reports indicate Talisman will begin testing the play before the end of the year (DOB, July 29, 2011).

Resource plays are continuing to mature, with light oil and liquids-rich gas being on the forefront. While gas prices are low, the economics for liquid products are more favorable. All resource plays in Western Canada are now producing about 1 mmboed, 80 percent of which is gas.

Current resource plays span intervals from Cretaceous to Devonian in age:

- Cretaceous – There are six basic Cretaceous resource plays in western Canada, with average production over 550,000 boepd, approximately 80 percent

See **Kitimat**, page 56

UPCOMING EDUCATION SCHEDULE

Field Seminars

Sedimentology and Sequence Stratigraphic Response of Paralic Deposits to Changes in Accommodation — **Sept 22 - 29**
Grand Junction, Colorado

Fundamentals of Wrench Tectonics — **Sept 26 – Oct 1, 2011**
Istanbul, Turkey

Complex Carbonates Reservoirs: Sedimentation and Tectonic Processes — **Oct 9 – 15, 2011**
Begins in Naples, Ends in Rome, Italy

Short Courses

Fracture and Geomechanical Characterization of Hydrocarbon Reservoirs — **Oct 22 – 23, 2011**
Milan Italy, with AAPG International Conference and Exhibition

The Application of Geomechanics in International Shale Plays — **Oct 22 – 23, 2011**
Milan, Italy, with AAPG International Conference and Exhibition

Last Chance

Fall Education Conference - Unconventional Resources: Focus on Shales — **Sept 12 – 16, 2011**
Houston, Texas

WATCH FOR DETAILS FOR 2012 PROGRAMS COMING SOON!

Registration and Information:

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Download a registration form at http://www.aapg.org/education/index.cfm

Kitimat

from page 54

gas. These are Bluesky/Gething oil, Cardium oil, Viking oil, Deep Basin gas, Glauconite gas and Nikanassin gas.

Triassic-Jurassic – The four Triassic-Jurassic plays are the Jurassic Amaranth oil sands play of Manitoba and Sawtooth oil play of Saskatchewan, plus the Triassic Montney oil and gas plays of Alberta and British Columbia. Total production is in excess of 400,000 boepd.

Amaranth oil sands have been tested by over 350 horizontal wells drilled and are producing over 14,000 boepd with about 89 percent of the production being gas.

The Montney is by far the most prolific unconventional play in Canada, with a combined production of 380,000 boepd (95 percent gas or 2.2 bcf/d) from very-fine grained dolomitic sandstones and siltstones.

Mississippian-Devonian – The five Mississippian-Devonian plays are the shale gas of the Horn River Basin, carbonates of the Pekisko, Slave Point/Swan Hills carbonate oil play, the proven Bakken oil in Saskatchewan plus the breaking Alberta Basin "Bakken" oil play and the recently emerging Duvernay shale play.

Together these plays produce about 100,000 boepd, 15 percent gas.

The Alberta Bakken-equivalent Exshaw shale petroleum system includes the over- and underlying limestone reservoirs of the Banff and Big Valley. These two carbonates are the most likely horizontal drilling candidates.

Over 30 horizontal wells have been drilled to date, but very little public information available to help de-risk this project.

Production numbers from the Bakken in Saskatchewan continues to grow. The apparent success of water-flood pilot wells only enhances the viability of this light-to-medium oil resource. Current production is in excess of 65,000 boepd from 2,800 wells.

The Slave Point/Swan Hills oil play on the flanks of major producing oil fields has largely been de-risked. There have been over 200 wells drilled with current production over 14,000 boepd.

The shales of the Horn River Basin in northeast British Columbia are producing over 90 mmcf/d from about 20 wells. Although the play appears to cover over 1.3 million acres – an area over twice the size of the Barnett Shale play in Texas – development has been negatively impacted by low gas prices and the need for infrastructure.

Market Diversification

Of considerable concern to most Canadian producers is the stranded nature of countrywide resources. Currently, the United States is the only available export market.

This limited access to markets leads to significant commodity price discounts. Every exporter knows that having access to multiple market places is good for market prices and competitiveness.

The authorization by the U.S. Department of Energy to Cheniere Energy in May 2011 granting LNG export capacity has perhaps set a precedent for Canada to follow.

Dec. 9, 2010, Kitimat LNG applied for an export license from the National Energy Board (NEB), which would allow the Kitimat facility when completed to ship natural gas to the Asia-Pacific market.

Nearly eight months later on July 25, the NEB announced that it will consider an application submitted by BC LNG Export Co-operative LLC (BC LNG) for a 20-year license to export up to 1.8 million tonnes of liquefied natural gas annually from Canada to Pacific Rim markets. This application is based on projections that the demand for natural gas in Pacific Rim markets will continue to increase substantially over the next 20 years.

The Kitimat LNG project on British Columbia's west coast is an important step in developing market diversification for at least one Canadian commodity.

"There are plentiful natural gas supplies and reserves that have created a remarkable opportunity to expand our North American energy trade to other continents," said Carol Howes, media relations manager for Calgary-based Encana Corp. "The terminal is designed to open up Pacific Rim markets for Canadian gas.

"With our partners, we are all helping to lead a continental push to deliver natural gas exports for the first time from Canada to overseas markets," she said. "This project will help to expand trade, generate investment and create new jobs and additional government revenues.

"We expect the project will help to advance North America's natural gas economy to markets where demand is growing and natural gas prices are more closely tied to oil prices."

Online Registration Open for Singapore GTW

Registration remains open online for "Unconventional Hydrocarbon Plays in Asia," an AAPG Geosciences Technology Workshop in Singapore – but the workshop itself has been rescheduled.

The GTW, originally scheduled for this fall, will be held March 15-16.

The workshop is designed to specifically cover exploration for unconventional assets through studies and data that address unconventional resource play mapping, estimate and analysis, experiences and ideas among the players in Asia.

Sessions will cover shale plays, coal seam gas plays and other alternate hydrocarbon plays throughout Asia, from China to Indonesia to the Indian subcontinent, within the context of global analogs.

To register, or for more information, go online to www.aapg.org/gtw/singapore2012, or contact Adrienne Pereira, program manager for AAPG's Asia Pacific office, at apereira@aapg.org.

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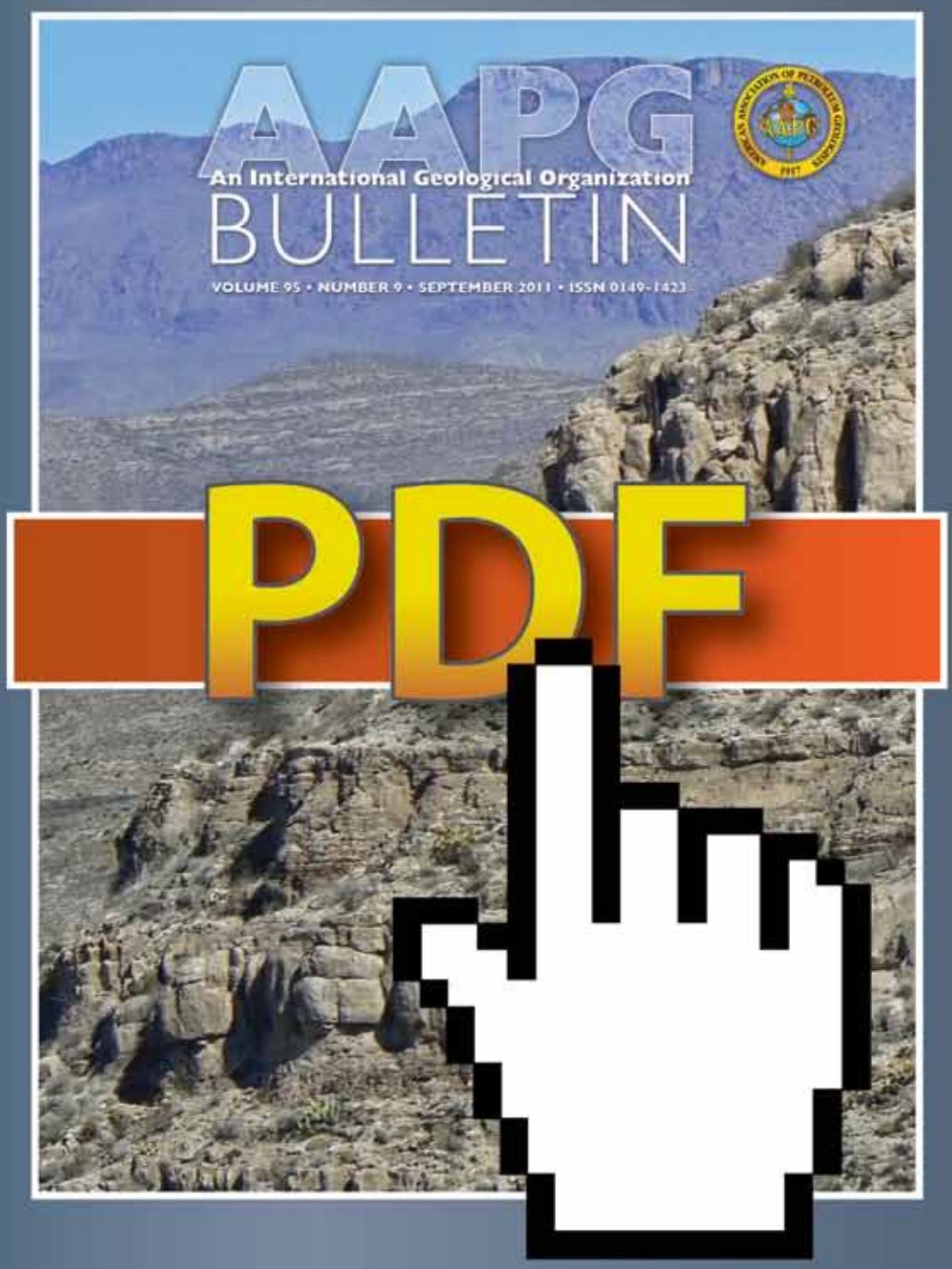

The AAPG Bulletin is a technical journal that is recognized in the industry as the leading peer-reviewed publication for information on geoscience and the associated technology of the energy industry.

The link below takes you to the Members Only login page where, with a few key strokes, you can click on a link for the Bulletin Online, the current issue, or for the Bulletin Archives, all issues of the Bulletin to date. Online as searchable html and .pdf files, the current issue is always available by the first of every month.

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Also, submit your next paper for consideration via www.aapg.org/bulletin

Article highlights include:

Lacustrine sequence stratigraphy

Wei Dong, Changsong Lin, Kenneth A. Eriksson, Xinhuai Zhou, Jingyan Liu, and Yubo Teng

This study of a lacustrine rift succession, Bohai Bay Basin, northeast China, augments the understanding of depositional system configuration and systems tracts in a typical rift basin. The most favorable sandstone reservoirs in this study are developed in sublacustrine fan deposits.

The Pennsylvanian of the Permian

Wayne R. Wright

Wright's paper summarizes the depositional history of the Pennsylvanian succession of the greater Permian Basin. New depositional system paleogeographic maps are presented to provide a fresh interpretation of the evolution of the highly productive Pennsylvanian succession.

Greater hydrocarbons potential?

Rüdiger Lutz, Christoph Goedicke, Kai Berglar, Stefan Schloemer, Dieter Franke, and Yusuf S. Djajadihardja

This study integrates geophysical, gas-geochemical, heat flow, and well data with results from amplitude versus offset analyses and petroleum systems modeling to predict the timing and locations of hydrocarbon generation in a frontier area situated in a fore-arc setting.

Inside a salt dome minibasin

Grigoriy Perov and Janok P. Bhattacharya

Three-dimensional seismic data are used to examine the geomorphology and internal facies architecture within a sequence stratigraphic framework of a shelf-margin delta in a salt dome minibasin Gulf of Mexico. This study evaluates potential heterogeneity of sandy and muddy depositional elements.

Goal is to teach applied science

Courses, Field Trips Offer Useful Tools

By BARRY FRIEDMAN, EXPLORER Correspondent

Short courses and field seminars, part of AAPG's educational outreach, follow a similar prescription: top-quality instruction, engaging topics, inquisitive students, good food and exciting locations.

Wait … good food?

Keep reading.

But first, some basic information: AAPG's education offerings have been an important part of the Association's mission – some would say the most important part – for decades. Literally thousands of the geoscientists responsible for providing energy to the world received at least part of their training via AAPG courses.

HOLBROOK

SCHOLLE

Participants include professionals from the industry's largest companies as well as consultants who office only with themselves. Students get indoctrinated, professors get updates, experts in one area find out there may be something in another area they need to know about.

Instructors are varied, too, comprising academicians as well as veteran industry experts with a lifetime of practical experience.

Photo courtesy of Tom Ryer

On the rocks: Participants in the AAPG Clastic Reservoir Facies field seminar, studying exposures of the Ferron Sandstone in Neilson Wash, Henry Mountains Basin, Utah.

And since short courses and field seminars are a valuable part of building Association programs in the training and education of members, getting more working geologists and professionals in the industry to take part in these courses is a priority.

And that part of the mission – developing courses that are not only up-to-date but actually needed by industry professionals – is a big part of AAPG's challenge.

In the Trenches

Instructors have their challenges, too.

Some who have led such programs, like AAPG members John Holbrook and Peter Scholle, say that while the overall experience is rewarding for both student and instructor, challenges abound both inside the classroom or in the field – and on the way, there are plenty, too.

Holbrook, earth and environmental sciences professor at UT-Arlington, teaches two AAPG courses – "Getting Started in Fluvial Stratigraphy" and "Fundamentals of Sequence Stratigraphy" – and he says to teach a successful short course an instructor must find not just the right subject matter and a collection of interested participants, he must find something else.

"Time is the fire in which we burn," Holbrook said. "I don't think AAPG can do much about that. We are all just strapped for time."

Once it's found, however, he likens the dynamic and the relationships in a short course to those in any conventional classroom.

"I've been told by different students that if they can come up with one good concept or technique from the course that they can actually put to use on their play, the course is a success for them," he said.

Unlike a college course, however, where there is an assumption that students enrolled have a similar base of knowledge, those who take a short course are more likely to arrive with varying backgrounds. His goal, then, as he describes it, is to provide a "story" that will permit the participant to fill in his or her educational gaps.

"And if in the process I gave them a useful tool they did not have before, I really feel good about what we have done that day," he said. "I figure I've done my job."

For AAPG award winner Peter Scholle, formerly of the New Mexico Bureau of Geology and Mines, the main challenge in either a short course or a field seminar is finding the right student-teacher ratio.

"My wife (also a geologist who partners with him in most of his AAPG courses) and

Continued on next page

Have a Field Seminar Idea?

AAPG's Education Department is looking for a geologists who have a desire to lead an AAPG field seminar.

It's looking for some good proposals for new courses and locales, too.

AAPG invites you to submit a proposal to teach a field course – as soon as you can. With planning now, the course could be approved and offered as soon as next March.

It's a great opportunity to share your knowledge with other geoscientists – and have an unforgettable experience at the same time.

So, if you miss finding great examples of different types of rocks, structure and fossils – or just miss the smell of dirt and freshly broken rock, the tug of cactus on your khaki pants and the taste of hot coffee on a brisk morning in the field – consider this fortuitous offer.

To propose a topic, location or person – yes, you can propose yourself – fill out the online form at aapg.org/education/proposals/seminar_form.cfm.

Questions? Call 918-560-2650, or email educate@aapg.org.

Continued from previous page

I have had many fine experiences both in running field seminars in the Guadalupe and Sacramento Mountains of west Texas and New Mexico, and in presenting carbonate petrography and carbonate depositional models seminars," Scholle said. "The best experiences were usually in smaller classes where we could spend more one-on-one teaching and discussion time with participants.

"Large classes, especially when it is a mixed audience of geologists, geophysicists and engineers, are the most difficult to teach," he continued.

"It is hard to find a level for such a diverse audience that does not bore the knowledgeable or baffle the inexperienced attendees."

A Taste For Success

And for AAPG, there's another level of challenges – defining and developing the courses that members need in today's rapidly evolving profession, and then finding the very best experts to lead the class or field seminar.

One new approach: AAPG now tries to find universities that regularly offer field trips to students, and then ask if the institution would lead similar courses to the AAPG general community.

"Further, we have put our Education Committee members on alert to be on the lookout for interesting trips they see or participate in that they could recommend as well," said Debbi Boonstra, AAPG's education department manager.

"I've always tried to put myself in the place of the students' position," Holbrook said. "Relevance to what the student does and a presentation they would understand from their prospective is what I think is most important in course design."

Scholle welcomes the idea of getting more involved, as long as there is coordination.

"The problems we have had with AAPG that were frustrating were that enrollment was kept open until the last minute," he said. "This is a real problem for field seminar leaders who have to keep changing lodging, food and transportation arrangements," which he says is a very time consuming and sometime costly process.

Oil companies, he adds, like to keep their options open and often have their folks register (or de-register) very late.

"Good for the industry, OK for AAPG, but very hard on instructors," he said.

Now, about what's important on a field seminar – Scholle, who says he would enjoy one day to teach again for AAPG, says this:

"The successful field trip will include an interesting topic, excellent outcrops or cores, one or more knowledgeable and engaging presenters, good interpersonal chemistry among participants, good lodging, food and transport, and direct applicability of the information presented to the jobs of participants."

Food?

If you think he's joking about that, think again.

Successful field trip leaders know that field trip participants, like Napoleon Bonaparte's armies, march on their stomachs. That's why participants have been known to enjoy Guadalupe Indian food in New Mexico, fresh shrimp in North Carolina or, in Montana, sweet huckleberry jam on their morning toast.

"It is actually the only direct advice I ever got from AAPG on running field conferences," he said: "'People forget good outcrops, but they never forget bad food.'"

AAPG Field Seminar Stats

The longest-running current AAPG field seminars:

- Clastic Reservoir Facies (1996 to present)
- Play Concepts and Controls on Porosity (2000 to present)
- Fractures, Folds and Faults in Thrusted Terrains (2004 to present)
- Sedimentation and Sequence Stratigraphic Response of Paralic Deposits (2005 to present)
- Complex Carbonate Reservoirs (2005 to present)
- Modern Terrigenous Clastic Depositional Environments (2006 to present)
- Deep-water Siliciclastic Reservoirs (2006 to present)
- Folding, Thrusting and Syntectonic Sedimentation (2006 to present)

The longest-running AAPG field seminars (historically):

- Sequence Stratigraphy and Reservoir Distribution in Modern Carbonates/Bahamas (1985 to 2009)
- Modern Clastic Depositional Environments (1985 to 2005)
- Modern Deltas (1986 to 2006)

Most popular AAPG field seminars (based on number of participants)

- Modern Terrigenous Clastic Depositional Environments
- Deep-water Siliciclastic Reservoirs
- Complex Carbonate Reservoirs
- Clastic Reservoir Facies
- Sedimentation and Sequence Stratigraphic Response of Paralic Deposits
- Folding, Thrusting and Syntectonic Sedimentation
- Fractures, Folds and Faults in Thrusted Terrains
- Play Concepts and Controls on Porosity

Like what you see? The AAPG website makes it easy to share that opinion with others.

WWWUPDATE

We Recommend You 'Like' This Article

By JANET BRISTER, AAPG Website Editor

To "like" or not to "like" – that's a curious question.

Many websites, including the AAPG site, are now featuring the familiar "Like" button made popular in Facebook, which engages users as they view and research information on web pages.

Typically, if people "like" the page, they can share that opinion by clicking on the "Like" button.

But here's our point: When you click that button you may be saying many things besides a simple "Like."

Sometimes you may be saying, "I found this useful," or "This information helped me."

But what about information on that same page that isn't so "like"-able? Or are we becoming conditioned to click on that button without any thought for what that vote is saying?

Just what does that click tell?

In other words, when we surf the web and scan for content, are we going so fast that we are not stopping to think about what we are responding to? Are we conditioning ourselves to read and click on impulse?

* * *

In a recent article appearing on Mashable, a website focusing on "social and digital media, technology and web culture," Josh Catone featured Eli Pariser's insights from his book, "The Filter Bubble."

Pariser says that we may be filtering our content to the point of missing vital information.

He points out "like" is a very neutral word, observing that "it's easy to like 'I just finished a marathon,' and hard to like 'cell phones may cause cancer.'"

Your click floats that detail to the top of a website's favorite details, while the ignored or less "like"-able element falls down, down, down the list. Yet, it may have the more important information.

This illustrates the danger in websites filtering and personalizing the information being fed to us.

* * *

Now the AAPG website has introduced the "Like" button within the EXPLORER pages. The button's purpose serves to highlight the articles within the Facebook accounts of our members.

When you click that button it tells the world this article is noteworthy and bumps it up in the search engine results on the topic the article covers.

It is saying this content matters for some reason. The reader found it useful, informative, thought provoking or it added value into his/her knowledge, career or skill set.

This is how the AAPG membership can help the world discover the information of value to its industry.

(It would be nice if the "Like" button actually read "Recommend," but it is tied to Facebook so we must live with what is provided – but we are asking the membership to realize that when they "Like" one of our postings, they are in fact "Recommending" it to another person.)

So take a minute to click – but pause a bit longer and add a comment clarifying why you clicked. An endorsement makes it even better.

Good browsing!

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

PROFESSIONAL newsBRIEFS

Mitchell Burk, to consultant, Magnolia, Texas. Previously retired as exploration geologist-deepwater Gulf of Mexico, Marathon, Houston.

Don Felio, to partner and managing director, Chimney Rock Capital Partners, Denver. Previously consultant and executive affiliate, Boulder, Colo.

Ned Frost, to research associate, Bureau of Economic Geology, The University of Texas, Austin, Texas. Previously senior geologist, ConocoPhillips Subsurface Technology, Houston.

Lowell E. Gladish has written a novel, "It's Not Easy," about the drilling of a new oilfield in Indiana in the 1950s. Gladish resides in Jasper, Ind.

Marc H. Helsinger, to executive vice president-exploration and business development, Focus Exploration, Houston. Previously vice president-exploration and business development, Focus Exploration, Houston.

Wade D. Hutchings, to Alaska asset team manager, Marathon Oil, Kenai, Alaska. Previously technical excellence manager, Marathon Oil, Houston.

Dennis L. Ingles, to senior development geophysicist, Nexen Petroleum UK, Uxbridge, England. Previously senior geophysicist, Nexen Petroleum USA, Plano, Texas.

Paul Mann, to professor, University of Houston, Houston. Previously senior research scientist and lecturer, University of Texas at Austin, Austin, Texas.

Michael O'Donnell, to exploration manager, Forestar Minerals/Forestar Oil and Gas, Fort Worth, Texas. Previously exploration geologist, Suemaur E&P, Fort Worth, Texas.

Matt Silverman received the 2011 Oil Recognition Award from Desk and Derrick for outstanding service in promoting the petroleum industry. He is exploration manager for Robert L. Bayless, Producer, Denver.

John Snedden, to project director-Gulf basin depositional synthesis project, Institute for Geophysics, University of Texas at Austin, Austin, Texas. Previously geological adviser, ExxonMobil Production Deutschland GmbH, Hannover, Germany.

Douglas Valleau, to director-unconventional E&P technology, Hess Corp., Houston. Previously director-global unconventional new ventures, ConocoPhillips, Houston.

Luis Vergara, to new ventures senior geologist, Apache Egypt, Cairo, Egypt. Previously head of Nile delta offshore, RWE Dea Egypt, Cairo, Egypt.

Michael Verm, to chief operating officer-USA, Aurora Oil and Gas, Houston. Previously executive vice president, Entek Energy USA, Houston.

Charlie Wu, to vice president E&P, Pacific Oil and Gas, Jakarta, Indonesia. Previously vice president and general manager, Petroselat, Jakarta, Indonesia.

Career Center: Where Jobs and Geologists Meet

By KARRIE FERGUSON, AAPG Member Services Specialist

The online AAPG Career Center, which gives employers and job-seeking professionals a premium way to find one another, continues to be a valuable tool that could lead to a perfect career fit.

Its value lies in its unique potential for matching specific company needs with AAPG members' specific talents and experiences.

While other online sites may offer job listings and résumé postings, AAPG's Career Center avoids the mass-market approach of the mega job boards offer.

That means:

- **Employers** who use the site to seek new hires can target a focused audience of qualified industry professionals, post jobs, search over 300 résumés and promote their company online.
- **Jobseekers** who use the site can post résumés with confidence, search job listings and receive automatic email notifications whenever a job matches your criteria.

New job opportunities are being added and claimed daily.

Your exclusive membership in AAPG is the key to these unique online opportunities – so stay in touch – use the AAPG Career Center.

For more information, contact Karrie Ferguson at kferguson@aapg.org, or go online to www.aapg.org/careers/careercenter.cfm.

GeoCare benefit

AAPG Offers ID Theft Assist Program

By MELISSA S. HUGHES Creekmore Livingstone

AAPG's GeoCare Benefits Program now offers a service to help members in the case of identity theft – specifically, to fix the damage that an identity theft has created, bring order to the chaos and essentially make it all go away.

Identity theft seems to have faded from major headlines, but despite its exit from the spotlight and with the how-to avoid-it-guidelines ringing in our ears, identity theft is still with us.

In fact, it's a problem victimizing one in 20 annually, with an identity compromised every four seconds.


HUGHES

Identity theft is one of the few crimes in which the victim is often asked to prove their innocence.

An Identity Fraud Survey Report by Javelin Strategy & Research states that although the incidents of identity theft and identity fraud dropped slightly in 2010, the incidents taking place today are costing consumers more money and taking more time to resolve.

Some popular sources of identity theft include:

- Stolen or lost wallets, which account for 42 percent of identity theft.
- Skimming, in which credit/debit card numbers are stolen by using a special storage device when processing your card.
- Phishing, where individuals posing as financial institutions or companies send spam or pop-up messages to get you to reveal your personal information.
- Stolen paper mail (known as "dumpster diving") accounted for only 3 percent of identity theft in 2009.

The fastest-growing type of identity theft today is medical identity. In these cases, thieves will use stolen health insurance information to pay for medical services-costing the victims potentially thousands of dollars out of their own pockets.

Although use of the Internet only attributes to approximately 11 percent of all identity theft (data breach is the same), the Commerce Department warns, "With online transactions estimated at $10 trillion globally each year and growing, the threat of online theft has also grown."

In 2010 approximately 55,000 new viruses, worms, spyware and other threats bombarded the Internet daily. Even large companies are having a harder time securing personal information. Since this past spring, Sony Corp., Google Inc., AT&T (via iPad) and Lockheed Martin reported hacks and data breaches.

As what's being called "cyber insurance" is emerging to protect companies against civil suits and fines levied by regulators in the case of a data breach, consumers are finding themselves less protected and more liable.

"A consumer who has been the victim of a data breach is four times more likely to suffer identity theft," quotes a letter sent by a coalition of consumer and privacy groups urging the Senate for stronger legislation to protect consumers' private information collected by companies.

Financial loss isn't a victim's only potential problem – identity theft is one of the few crimes in which the victim is often asked to prove their innocence.

Phil Blank, a senior analyst for security, risk and fraud at Javelin Strategy & Research, said that unless the user of a stolen identity is making large purchases or opening new accounts, the victim is often in the dark until they're contacted by the IRS.

"Then you have the problem of proving it wasn't really you," Blank said.

Reuters.com reported a story of a man who had this very experience. In 2008 he was contacted by the state tax authorities stating that he failed to file a return on income earned at a company where he had never worked. He suspects his identity was stolen when he refinanced his mortgage in 2005

Continued on next page

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and has since discovered at least 12 occasions when his name and Social Security number were falsely used to get work. He's still working to clear his name, three years after he discovered he was a victim of identity theft.

When he contacted the employers of his identity thieves, he said, "I had no voice. Every time I told them it wasn't me, they said 'prove it.' I've done everything I can do, other than visiting the companies themselves."

Typically when an identity theft occurs, victims spend an average of 21 hours cleaning up the mess and piecing their financial lives back together. It's a daunting and time-consuming task to contact the Social Security Administration, the Federal Trade Commission and the Internal Revenue Service, in addition to the appropriate creditors and filing the recommended complaint form online to the Internet Crime Complaint Center.

How We Can Help

AAPG's GeoCare Benefits Program, called ID Theft Assist™, helps you protect yourself against identity theft – and more important, if you do become the victim of identity theft, Identity Theft Assist includes services to resolve the problems caused by such a theft.

With one phone call, ID Theft Assist untangles the red tape and handles the arduous, time-consuming tasks a victim would otherwise have to assume.

ID Theft Assist brings a leading credit bureau and a respected 24/7 crisis response team together to provide a comprehensive identity recovery system that enables them to take care of every aspect of recovering your identity.

- Triple Bureau Credit Monitoring – ID Theft Assist offers proactive, pre-incident components such as a Triple Bureau Daily Alert credit monitoring service to detect any possibility of identity theft. If identity theft does occur, response time is critical.
- Crisis Response – ID Theft Assist's team has the experience necessary to capture the appropriate information from you to begin to immediately work on your behalf to re-secure your credit and resolve any possible issues regarding criminal or employment fraud.
- Travel Abroad with Assurance – ID Theft Assist's services are available to you even if something happens while traveling abroad. Emergency cash can be provided if necessary and, with 24/7 unlimited telephone access to representatives in over 200 countries, translating services for 26 languages is provided in case help is necessary in communicating with local law enforcement.

ID Theft Assist allows you to walk away from the stress of identity theft.

To learn more about the benefits provided by AAPG's GeoCare Benefits ID Theft Assist, or to learn a few tips on how to protect your identity, visit geocarebenefits.com/idtheftassist.asp.

And if you or a member of your family have experienced identity theft and are willing to share your story, please contact Melissa Hughes at (941) 639-3333, ext. 3, or by email at mhughes@creekmorelivingston.net.

Three AAPG Section Meetings Coming Fast

Annual meeting season has arrived for three AAPG Sections, all of which will hold their events in the coming several weeks.

Those meetings include:

- The Eastern Section annual meeting, which will be held Sept. 25-27 in Washington, D.C.

The meeting's theme is "On the Edge of A New Energy Frontier," and sessions will be held at the Hyatt Regency, Crystal City, in Arlington, Va.

Featured theme sessions include:

✓ Eastern Shale Gas.
✓ Carbonate Sedimentology, Stratigraphy, and Diagenesis.
✓ Carbon Sequestration.
✓ Geochemistry of Produced Waters.

- The Mid-Continent Section annual meeting, which will be held Oct. 1-4 in Oklahoma City.

The meeting's theme is "Exploiting Known Reserves as a Bridge to the Future," and featured technical sessions include:

✓ Shale Plays and Unconventional Reservoirs.
✓ Seismic Techniques and Borehole Evaluations.
✓ New Ideas in Old Areas.
✓ Exploration Technologies – Old and New.

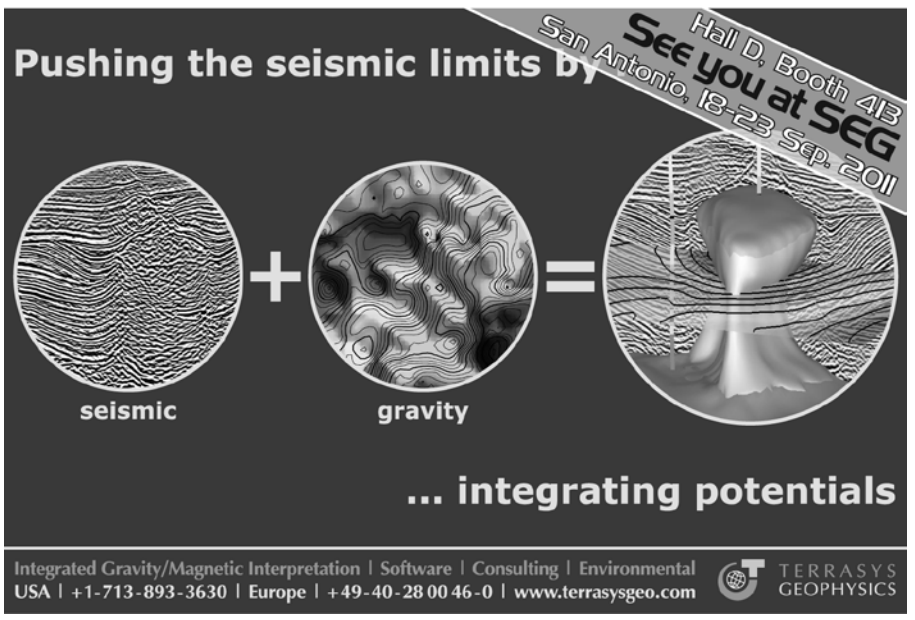
- The Gulf Coast Section (GCAGS) annual meeting, which will be held Oct. 16-19 in Veracruz, Mexico.

The meeting's theme is "Sharing Knowledge to Add Value," and technical sessions will include:

✓ Remaining Potential in Circum-Gulf of Mexico Petroleum Provinces.
✓ The Gulf of Mexico Deepwater Setting – Geology and Economics.
✓ Seismic Imaging and Interpretation of Geological Complex Areas.
✓ A special symposium on "Jurassic Regional Framework and Reservoirs in the Gulf of Mexico."

Details on all meetings are available via "Meetings Home" on the AAPG website.

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.



MEMBERSHIP&CERTIFICATION

Membership Applications Move to AAPG Website

By VICKI BEIGHLE, AAPG Membership Manager

Notice something missing here? This typically is where you would find the list of applicants for membership in AAPG.

But no more.

Starting this month, applicant information now will be found only online – easily accessible via the AAPG website – in an effort to shorten the application process time.

To see the list of applicants (and their sponsors), simply look for the "applicant" button on the bottom right of our home page.

Click on the button and you'll go to information for each Active applicant – whether they are applying as a new member, transferring from Associate or applying for reinstatement.

The new system is the result of recent Executive Committee approval of a proposal submitted by the AAPG Membership Communication and Coordination Committee, chaired by Andrea Reynolds, to streamline the AAPG membership application process.

This proposal is within the authority granted the EC by the AAPG Constitution and Bylaws and is aligned with the AAPG Strategic Plan.

"The new approach will significantly shorten the application processing period for most applicants, because it will allow the 60-day review by membership to commence immediately after the application is deemed complete and sponsors pass check by headquarters staff," said EC member Jeff Lund, chair of the AAPG House of Delegates.

"This makes the AAPG Active membership application experience more welcoming to all qualified geoscientists," he said.

Previously, the print publishing in the EXPLORER added 30-60 days to the process because of logistics and various deadlines.

Provided all necessary documentation is received, the online availability should shorten the overall application review time by 60 to 90 days from approval to acceptance.

INMEMORY

Shreveport, La., independent geologist and 44-year AAPG member James B. "Jimmy" Harris, died Aug. 9 in Shreveport, La. He was 76.

Harris, a native of Terrell, Texas, was quarterback for the University of Oklahoma Sooners' split-T offense from 1954-56 and was 31-0, never losing a game as a player and one of the lead architects of OU's NCAA record 47-game winning streak.

Majoring in geology at OU, Harris played four years as a defensive back in the NFL "just to see if I could." In 1966 he and another former OU football player from the 1920s for whom he roughnecked during the summers formed Midroc Operating Co. in Shreveport, which has operations in Louisiana and Alabama.

In a 2005 interview, Harris said of the exploration industry "It's kind of like playing football. If you win, it's lot of fun. If you lose and drill dry holes, it's not a lot of fun. You try to have a good team and get a good track record. You have a tendency to have lots of good people around you."

* * *

John David Davis, 83
Santa Fe, N.M., March 6, 2011

William Ronald Dixon, 75
Midland, Texas, Aug. 24, 2010

Arthur Lloyd Flood, 83
Calgary, Canada, March 15, 2011

James B. "Jimmy" Harris, 76
Shreveport, La., Aug. 9, 2011

Christopher Joseph Krotzer, 76
Metairie, La., March 11, 2011

Thomas E. Matson, 94
Tulsa, June 15, 2011

David Wilson McDonald (AS '98)
Dallas

Herman Friday Middleton, 89
Tulsa, June 10, 2010

Richard Wallace Powers, 84
Austin, Texas, Sept. 15, 2010

Mohammad Sabir, 69
Calgary, Canada, June 30, 2011

Michael Irvin Treesh, 65
Sugar Land, Texas, June 26, 2011

John Thomas Velkas, 87
Diamondhead, Miss.
June 22, 2011

David Stuart Walker, 79
Calgary, Canada, July 10, 2011

Michael Alan Wiley, 76
Canyon Lake, Texas, July 21, 2011

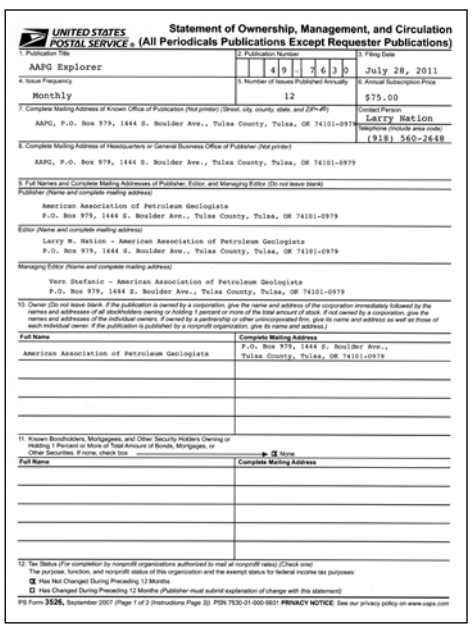
REQUESTS FOR FOUNDATION FUNDING

If you have a funding need that matches the priorities of the AAPG Foundation, please submit to Natalie Adams at nadams@aapg.org. For more information, go to foundation.aapg.org and click on the "Funding" tab.

All of the AAPG Foundation's funding decisions are made by a Board of Trustees that meets three times annually to review proposals. Applications for grants to projects and programs which fulfill its mission are welcome. Decisions are based on available funds.

TO CONTRIBUTE

If you would like to establish a fund or contribute to an existing fund, please go online (https://www.aapg.org/eDonation/Core/eDonation.aspx) or contact the Foundation staff by email (foundation@aapg.org), phone (888-945-2274, ext. 274) or mail to P.O. Box 979, Tulsa, OK 74101.



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Full Name	Complete Mailing Address

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☐ Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)

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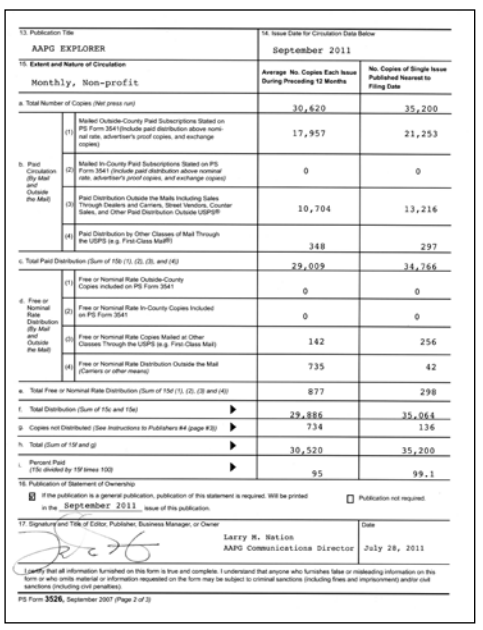

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I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

PS Form 3526, September 2007 (Page 2 of 3)

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If you are interested in further pursuing this opportunity, please apply on-line at www.gohalliburton.com (position reference #: 190867)

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Petroleum Exploration Geologist
Newfield Exploration
Tulsa, OK

Seeking Geologist, responsible for conducting detailed prospect analysis and play fairway assessments within the Mid-Continent Region plus the generation and presentation of prospect ideas and leads to management. This position would be located in Tulsa, OK.

The successful applicant will generate and update maps, logs, cross-sections and corporate databases with new tops, correlations, shows and other pertinent geological data. Develop regional, multi-county stratigraphic framework and subsurface correlations.

Minimum qualifications, ten years of experience, knowledge of Mid-Continent upstream oil and gas, experience with conventional and un-conventional plays, experience doing play-fairway analysis assessments. Send resume to klefler@newfield.com.

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DEVON ENERGY CORPORATION
CHAIR OF BASIN RESEARCH

The Boone Pickens School of Geology at Oklahoma State University (OSU) is extending its search for the endowed Devon Energy Corporation Chair of Basin Research. This Chair will be filled at the level of Professor, will carry tenure in the School of Geology, and will be filled by January or August 2012. Applicants must have a Ph.D. degree in geology or related field and have an outstanding record of research, commensurate with the rank of tenured full professor and a demonstrated record of funding. The specific field of study is open but special consideration will be given to geoscientists with interests in reservoir characterization and modeling, unconventional petroleum reservoirs, depositional and/or diagenetic systems, geochemistry of petroleum systems, and/or origin and migration of basinal fluids. Preference will be given to candidates with a close working relationship with the petroleum industry. The applicant must be committed to excellence in teaching both undergraduate and graduate students, will be expected to supervise M.S.- and Ph.D.-level graduate students and develop courses in his/her specialty.

The successful candidate will join a faculty of twelve geoscientists and will take a leadership role as part of campus and industry research groups in a department that has close ties to the petroleum industry. The school's teaching and research facilities include state-of-the-art geophysical field and laboratory equipment and software, the Devon Visualization Laboratory, and a wide range of petrographic and geochemical instrumentation. The School also maintains a field camp in Canon City, Colorado.

Candidates should submit a letter of application, including 1) a discussion of research interests, 2) approach to teaching, 3) curriculum vitae, and 4) the names, addresses, e-mail addresses, and phone numbers of three references to: Devon Chair Search, Boone Pickens School of Geology, 105 Noble Research Center, Oklahoma State University, Stillwater, Oklahoma 74078-3031, Phone: (405)-744-6358, Fax: (405) 744-7841. Screening of candidates will begin on October 17, 2011 and continue until the position is filled.

More information on OSU and the Boone Pickens School of Geology can be found on the web http://osu.okstate.edu and http://geology.okstate.edu respectively. Inquiries about this position may be directed to Dr. Todd Halihan (todd.halihan at okstate.edu) or Dr. Jay Gregg (jaygregg at okstate.edu). Committed to health and safety, Oklahoma State University maintains a tobacco free work environment. Oklahoma State University is an Affirmative Action/Equal Opportunity/E-Verify employer committed to diversity.

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Subsurface Modeling and
Geochemistry of Subsurface Fluids

The Department of Geology and Geography at West Virginia University seeks to appoint two new positions addressing expanded energy research efforts associated with the WVU Advanced Energy Initiative (AEI at http://energyresearch.wvu.edu/). The first position, in subsurface modeling, is open to specialists in 3D geocellular, geostatistical, depositional facies, reservoir/petrophysical, structural, and/or discrete fracture modeling. The second position will be a specialist in modeling of geochemical/biogeochemical reactions in deep/shallow fluids and gases in sedimentary basins, and is open to individuals with expertise in inorganic and organic water chemistry, ion exchange, reaction kinetics, and/or rock-fluid interaction. Both positions will be focused on resource and environmental aspects of energy development. The successful applicants will contribute to teaching at the undergraduate and graduate levels. However, the primary focus is development of a vigorous externally funded research program. A PhD in Geology or a related field in hand by the start date, evidence of ability to establish a vigorous externally-funded research program, and potential for and commitment to teaching excellence at the undergraduate and graduate levels are required. We are open to candidates with diverse academic and professional backgrounds. The department values intellectual diversity and demonstrated ability to work with diverse students and colleagues.

The July 1, 2011 edition of The Scientist (the-scientist.com) ranks West Virginia University among the top 20 places to work in academia. The Department is located in an outstanding newly renovated building. Visit www.geo.wvu.edu/files/modelchem.pdf for a full description of both positions and how to apply. Review of applications will begin October 15, 2011 and will continue until the position is filled. The anticipated start date is August 16, 2012. West Virginia University is an Equal Opportunity/Affirmative Action employer and the recipient of an NSF ADVANCE award for gender equity. Women and minority candidates are encouraged to apply.

MISCELLANEOUS

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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.

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.

READERS' FORUM

The Write Stuff

Regarding the debut article in the new "ProTracks" column (August EXPLORER), on the need for geologists to develop better writing skills:

I've found writing to be crucial to my career, as I was forced to change positions several times responding to the industry's various economic "storms" over the past 20-plus years.

Writing opened doors for me in publishing and kept me closely linked to geoscience and engineering topics as an editor for two major industry magazines. In my present position, clearly written material is essential to communicate to prospective clients about our products and services.

I encourage our newest professionals to develop their writing skills along with their technical knowledge. You never know what doors will open or how valuable clear communication skills can be.

Victor Schmidt
Houston

Where Are the Tests?

Regarding your article on "Climate, Coal and CCS Stir Debate" (Washington Watch, July EXPLORER):

Carbon Capture and Storage makes no sense unless you want to do it so you can tap it and further feed food plants in the greenhouses when Earth cools significantly.

Of all societies, how can a geological group support the hypothesis of man-made global warming when empirical evidence from Earth's past history does not support a significant impact on climate by CO_2?

As geologists, we were taught to look back at how Earth formed so we could understand why it is like it is today and maybe tomorrow. That approach works equally well regarding global warming or climate change.

Why has the 300-year-old requirement of testing a hypothesis against real, empirical observations been pushed aside regarding CO_2's impact, or lack thereof, on global warming?

Even Albert Einstein strongly promoted testing of his Theory of Relativity.

I know, as Pushkin said, "Where there is a trough, there will be pigs," but shame on us for ignoring the empirical evidence test just to support more research grants for CO_2 instead of demanding that money also gets allocated to studying the 20-odd other natural climate drivers.

H. Leighton Steward
Boerne, Texas

Tragic Trend

"*The Economist* (of London) asserts that using hydraulic fracturing to stimulate oil and gas wells can 'damage the water table, disrupt communities and even cause earthquakes,'" states Lee Fuller of Energy in Depth, Washington, D.C., in his letter. He continues to state that hydraulic fracturing has been used in the United States over 1.1 million times since 1940.

The July EXPLORER has two articles on fracking, "Frack Water Management Studied" and "Study Seeks to Inject Science Into Frack Debate," about looking for answers that field knowledge of fracking has not contaminated one gallon of subsurface water. The same EXPLORER also addressed "Putting the 'Clean' in Coal Technology," refuting the EPA's declarations of coal's pollution (used) to shut down coal electricity generating plants as it moves to a non-use of fossil fuel.

What is it with EPA bureaucracy, which uses dictatorship methods to destroy the economy? They ignore laws, lower unfounded standards for cleaner air and water below nature's doings, declare non-pollutants to be pollutants – such as CO_2, which is only .001173 percent of the atmospheric gases – ignore judge's orders, and more ...

It isn't serious anymore. It is tragic and dangerous as we the people are losing the Constitution and what it guarantees us.

Toby Elster
Wichita, Kan.

DIVISIONS' REPORT

Workshop to address best practices

Frack 'Secrets' Don't Engender Trust

By DOUGLAS C. PETERS, DEG President

Welcome to the 2011-12 series of short EXPLORER articles by the Division of Environmental Geosciences. As the new president of DEG, I get to kick off the series with my view of one of the technical areas that DEG – and AAPG in general – needs to address this fiscal year.

I come from a background of research, exploration and environmental work related to both energy (coal and uranium) and non-energy (precious and base metals) commodities, and both active and abandoned sites and mines. I have been an AAPG member since graduate school in 1977 and heavily involved in both EMD and DEG over the past 25 years.

I have been able to see close up the public perception and regulatory aspects of the mining and O&G industries, both through work and professional society activities.

In 2010, the Macondo oil spill in the Gulf of Mexico and its impacts was THE hot topic for the O&G industry in North America – and the industry continues to feel the reverberations from that event and the lingering distrust of the industry by the general American public and many politicians.

Some of that is opportunism to keep on bashing the industry for political gain or to support efforts to limit the industry in unrelated areas of the United States and the rest of the world.

All such incidents in the O&G world just help to support detractors of the energy industry and make difficult regulation even more onerous in places.

* * *

The energy industry's negative hot environmental topic of 2011 seems to be fracking and related aspects of aquifers.

In some parts of the United States and the world, this is intimately tied to exploration and development of shale O&G resources.

Public mistrust runs rampant, and politicians and regulators find themselves having to react to a groundswell of NIMBYs by doing anything from holding public forums and technical panels on the topic to outright bans on fracking, moving through county and state legislative bodies.


PETERS

> **The only way to fight the negative public reaction on this issue is to make the industry's practices as transparent and open as possible.**

But has the energy industry learned anything from how to deal with the public and regulators from the Gulf oil spill, or from many previous environmental events that keep getting dredged up by our detractors?

In many cases it seems not!

Most of the industry players in the fracking world seem to not yet have gotten the message that "secret" formulas and ingredients for their proprietary fracking methods do not engender trust and understanding in the public or government officials.

The word "secret" alone is enough to send every NIMBY and regulator into orbit, and yet the industry blindly insists its trade secrets are more important than getting the job done with minimal backlash from these groups.

We regret, but cannot forget, that the majority of the American public is no longer technically competent or caring enough – or so we are told by those who decry the state of our public education system – to understand the details of the O&G exploration and production process or related chemistry and physics.

But giving only technical details that might alleviate the concerns of technically competent people will leave the general public cold, or maybe even make them think you are trying to pull something over on them.

As geoscientists, we understand that a frack job thousands of feet down below many layers of variably fractured and porous to impermeable rocks is unlikely at best to ever have an impact on the shallow aquifers that most people and cities use for their water supplies. Yet, this is a penultimate current concern of the public.

Many cases of contamination of water wells by organic compounds have shown that the sources of those compounds are proximal to the impacted wells both laterally and vertically and have no connection to the activities of recent O&G rigs or wells in the area.

Nonetheless, there are enough examples of old (and perhaps poorly drilled or plugged) wells, and sometimes recent careless releases of drilling fluids that can be brought up to emotionally energize the populace and generate heavy scrutiny by regulators – even if those are very isolated cases and do not reflect current industry practices by the vast majority of operators.

* * *

The only way to fight the negative public reaction on this issue is to make the industry's practices as transparent and open as possible.

Get the word out to politicians and the public on what is being done and all the details needed to eliminate concerns about O&G activities.

Maybe that means revealing your secret formula for a better frack job. Maybe that means not using ANYTHING that can be considered a hazardous substance – and making that clear to the public!

NIOSH and the U.S. Dept. of Transportation have publications detailing the known and potential effects of just about every commercially available chemical, so ignorance of those aspects is not a good defense.

Keeping it secret means your company, and the industry as a whole, will get put under the microscope by people not friendly to you or the industry. Anything they find that is a potential "problem" will be emphasized and used again and again to limit industry activities or increase regulation – potentially to the point of activities being uneconomic or outright banned.

* * *

As part of DEG's efforts to address the current public distrust of fracking and its use by the O&G industry, we will be co-sponsoring, with EMD and DPA, a Geoscience Technology Workshop on the technology, tentatively planned for the first half of 2012.

This GTW will be an effort to bring together policy and technical people to both better define current best practices of the industry and to identify where best to have an impact on public policy and perception of the fracking process and the industry in general.

The workshop is just one step toward the goal of promulgating best practices and reducing negative perceptions and reactions to exploration and production where possible.

The DEG Executive Committee, Advisory Board and all our volunteers hope that this and other efforts in 2011-12 will keep you engaged and, if you are not a DEG member, interested in becoming a member and getting involved in DEG and the environmental side and aspects of the energy industry.

DEG will continue to do its best to keep those issues in front of the AAPG membership.

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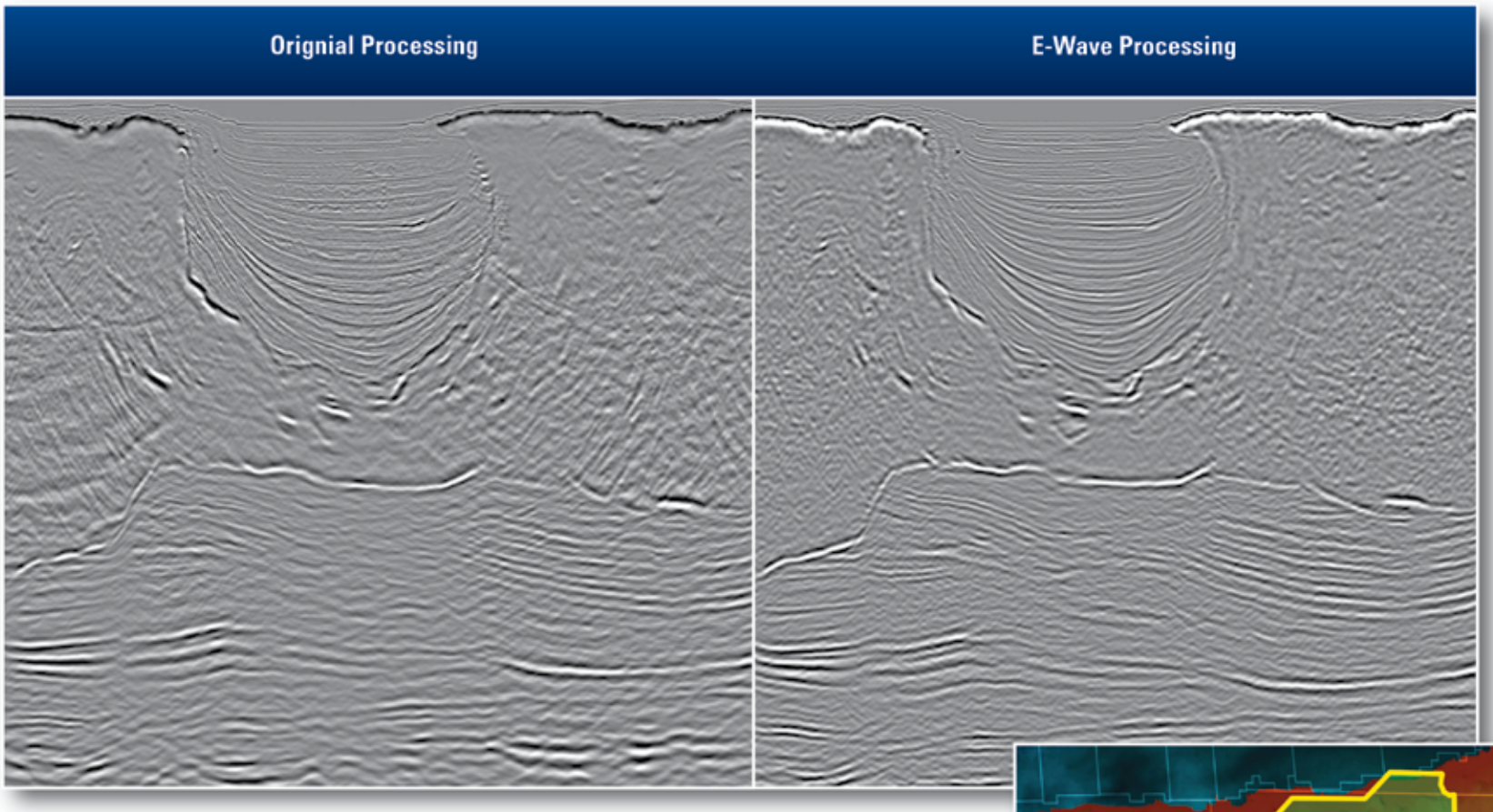

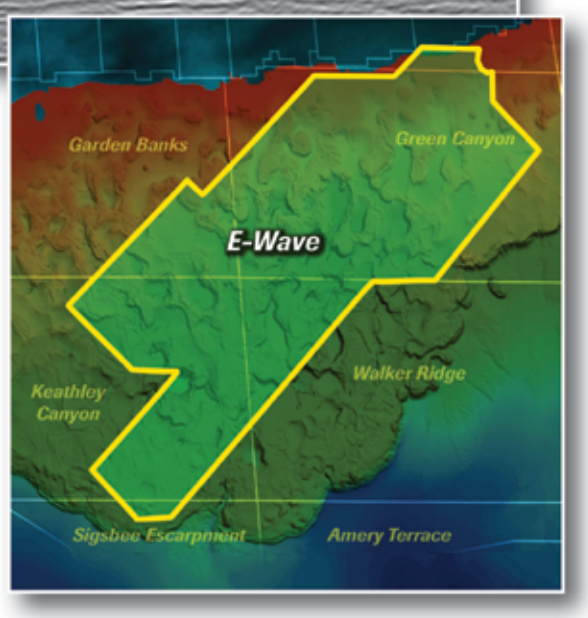

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