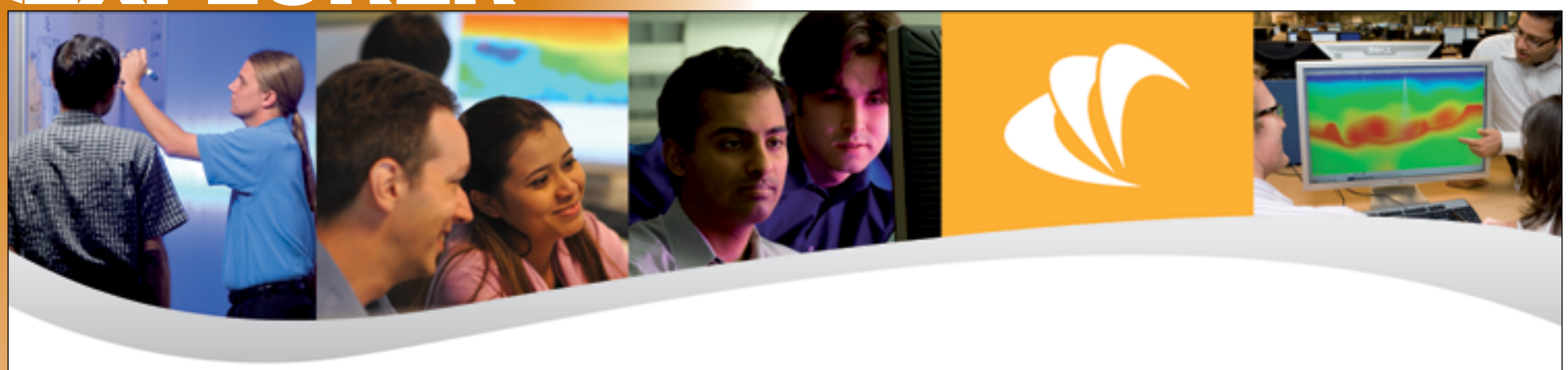
AAPG EXPLORER
OCTOBER 2012

Chapter Two

Old fields are getting new life in the Gulf Coast region

See page 10

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS AN INTERNATIONAL ORGANIZATION



Vol. 33, No. 10
October 2012

AAPG EXPLORER

PRESIDENT'S COLUMN

What Is AAPG Worth to the World?

By TED BEAUMONT

What is the value of the petroleum industry's professional associations – like AAPG – to society at large?

Although there is no straightforward way to quantify AAPG's value, it is probably quite large.

Is it some percentage of the scientific and economic contributions of Association members, or those influenced by our publications? If so, the impact of the recent surge in U.S. oil production due to unconventional resource plays alone implies an enormous impact.

Five years ago, the United States imported approximately 65 percent of the oil it consumed. Today, the United States imports approximately 45 percent of the oil it consumes – a difference of 20 percent. That 20 percent is more than $125 billion per year that stays in the U.S. economy (assuming $100/BO and 12 MM BOPD imported in 2007, EIA, 2012).

The influence of the Association on the petroleum industry must be responsible for part of those $125 billion per year.

At the 2012 AAPG All-Convention Luncheon in Long Beach, Calif., Robin West of PFC Energy said his company projects that the United States will import only 25 percent of the oil it consumes by 2025. That would be a 40 percent decrease from the 2007 oil import level, or a $275 billion dollar per year difference to the U.S. economy. Just five years ago that would have sounded crazy. And the unconventional resource play is spreading quickly to other parts of the world like Canada, Europe, Australia, China and Argentina.

Geologists, petroleum engineers, geophysicists, landmen and entrepreneurs made this revolution – and AAPG, its affiliated societies and its sister professional societies, like SPE and SEG, helped them do it, to the benefit of the world's economy.


BEAUMONT

Professional societies like AAPG can contribute to breakthroughs like the unconventionals revolution in several ways.

* * *

Professional societies like AAPG can contribute to breakthroughs like the unconventionals revolution in several ways, but there are two that are especially crucial:

▸ Probably the most important is the hardest to quantify. By nurturing communities of shared professional interest, the Association provides opportunities for framing and discussing challenges long before ideas are tested by the bit or the frac job – and certainly long before results are reported in the peer-reviewed literature.

This role surely will be documented when the history of the community that is AAPG's Energy Minerals Division is written. Being a part of such communities is one of the main benefits of Association membership.

▸ The Association also plays a key – and readily quantified – role in creating breakthroughs by vetting and disseminating information through the BULLETIN, the EXPLORER, talks presented at Section, Region, international and annual meetings, and at workshops and short courses.

More recently, AAPG has begun disseminating more and more information via the Internet.

From July 1, 2011, to June 30, 2012, AAPG published or posted through its online journal, *Search and Discovery*, 682 individual articles and 28 sets of meeting paper abstracts (representing 3,024 short abstracts from various conferences

See **President**, next page

EC Candidate Data Available Online

Video statements from all AAPG Executive Committee officer candidates, most filmed during the recent Leadership Conference in Tulsa, continue to be available online at www.aapg.org.

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

Biographies and individual information for candidates also remain available online.

Ballots for the election will open in spring 2013. The person voted president-elect will serve in that capacity for one year and will be AAPG president for 2014-15.

The slate is:

President-Elect

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

❒ **Kay L. Pitts**, Aera Energy, Bakersfield, Calif.

Vice President-Regions

❒ **István Bérczi**, MOL Hungarian Oil and Gas, Budapest, Hungary.

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

Secretary

❒ **Richard W. Ball**, Chevron Upstream, Southern Africa SBU, Houston.

❒ **Sigrunn Johnsen**, independent consultant with ProTeamAS, Stavanger, Norway.

Editor

❒ **Colin P. North**, University of Aberdeen, Aberdeen, Scotland.

❒ **Michael Sweet**, ExxonMobil Production, Houston.

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TABLE of CONTENTS

REGULAR DEPARTMENTS

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


Photo courtesy of Matthew Lee High

ON THE COVER:

A drilling location at South Bearhead Creek in the Tertiary Wilcox Trend in Louisiana – and an example of how the long-productive play has become a shining examples of successful old field rejuvenation. See page 10.

To the left: The geology of Texas' South Llano River State Park is interesting and complex; while the majority of Texas is covered with recent sedimentary rocks and deposits, there is a large, ancient blotch in the center of the state called the Llano Uplift. Dating back over a billion years (some of the oldest exposed rocks in America), the heavily metamorphosed Valley Spring gneiss and Town Mountain Granite form gentle, highly eroded hills around the lake. And why does this matter, you ask? See page 32.

Vol. 33, No. 10

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President
from previous page

and programs) – an increase of 11 percent from the previous 12 months.

The January 2011, issue of *Search and Discovery Digest*, compiled by editor Ron Broadhead, highlighted 25 unconventional oil resource play papers. The July 2011 issue of the digest listed 17 papers focused on relationships between fracture technology and reservoir geology of unconventional and tight reservoirs. The most recent digest (July 2012) had links to 15 papers that focused on shale characterization techniques.

Also, in the last 12 months more than one million individual visitors came to *Search and Discovery*, an open access website, asking for more than 2.5 million document downloads.

* * *

Most of the members in my age group joined AAPG to get the BULLETIN. I remember as a young professional looking at the bookshelves of older geologists like my dad and coveting their large collections of AAPG BULLETINS.

Times change and now members don't have to have large bookcases to hold all of their BULLETINS and books:

✓ All of AAPG's BULLETIN articles are available to all AAPG members through the AAPG website.

✓ All of the papers published in AAPG books – and a huge number of papers published by affiliated societies – are available through an individual or corporate subscription to AAPG Datapages.

Just think for a minute about how much information is disseminated by AAPG – and how valuable that information is.

Where would the world's petroleum industry be without the free flow of information shared by geologists from around the world?

How much is that information worth? Trillions of dollars?

Then, finally, think about one more thing:

What is AAPG worth to the world?

Ted Beaumont

Inaugural meeting

Abstracts Still Sought For URTeC

Organizers continue to seek papers for the inaugural Unconventional Resources Technology Conference (URTeC), a joint venture that will bring together for the first time the key disciplines and technologies engaged in the development of North American unconventional resource plays.

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

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

The event, organizers say, fills the unique need for a peer-reviewed, science-based unconventional resources conference that will take an asset team approach to development of unconventional resource plays – similar to how oil and gas professionals work in today's market.

Papers will be accepted through Nov. 15.

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

- Unconventional Project Development.
- Unconventional Reservoir Characterization.
- Unconventional Shale Plays.
- Unconventional Tight Oil and Tight Gas.
- Unconventional Coal Seam/Bed Methane.
- Other Unconventional Reservoirs.
- Formation Evaluation of Unconventional Reservoirs.
- Fracture Characterization.
- Lateral Well Characterization.
- Flow Mechanics in Tight Reservoirs.
- Laboratory Methodologies.
- Reservoir Monitoring.
- Organic Geochemistry.
- Well Performance Prediction.
- Fluid Behaviors.
- Drilling Optimization.
- Completion Optimization.
- Rock Mechanics.
- Three-D Seismic Applications.
- Health, Safety and Environmental Issues.

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

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

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

Jokers are wild

E&P Plans? Variables Are Being Dealt

By DAVID BROWN, EXPLORER Correspondent

What kind of hand will fate deal the energy industry during the remainder of the 21st century?

Amy Myers Jaffe sees wild cards.

Lots of wild cards, for the Gulf of Mexico and the oil and gas industry around the world.

Jaffe is a fellow in Energy Studies and director of the Energy Forum at the Baker Institute for Public Policy at Rice University in Houston, and serves as associate director of the Rice Energy Program.

She also teaches two courses at Rice, and she's a widely followed energy analyst, commentator and speaker on energy issues.

That's a big reason why she will take part in a panel discussion, "A Glimpse into the 21st Century Energy, Economy, Environment and Policy," set for the upcoming Gulf Coast Association of Geological Societies' annual meeting in Austin, Texas.

The outlook for the industry in the Gulf of Mexico and elsewhere will be affected by a number of variables, where outcomes are difficult to predict, Jaffe said.

Her top three:

1 – The future of the Middle East and the high degree of geopolitical uncertainty associated with that region.

2 – The way the world approaches the issues of environmentalism and sustainability, and how that affects the oil and gas industry.

3 – The global extent and impact of the shift toward unconventional resources.

She cites geopolitics, especially, as having the power to alter the world's energy picture, disrupt oil supplies and scuttle international exploration plans.


JAFFE

Geopolitics, especially, has the power to alter the world's energy picture, disrupt oil supplies and scuttle international exploration plans.

You can analyze a play area, understand the economics, choose the right technology, create an effective plan for development "and you can be completely incorrect, on the basis of geopolitics," she noted.

Random events also can re-stack the deck, at any moment.

As an example, Jaffe cited the Japanese tsunami in March 2011, the subsequent Fukushima nuclear disaster and Japan's resultant aversion to nuclear energy operations.

"Fukushima dramatically changed the outlook for the LNG market for the next two years," she said.

See **GOM**, page 8

GoM Exhibits Staying Power

No matter what happens in the years ahead, the Gulf of Mexico is likely to maintain its strategic importance in the global energy picture.

"I still think there's a lot of oil and gas to be produced, both from the U.S. side and the Mexican side," said Amy Myers Jaffe, fellow in Energy Studies and director of the Energy Forum at the Baker Institute for Public Policy in Houston.

In August, Mexico's government reported a promising discovery in the Gulf by state-owned oil company Pemex. The find came in an area known as El Perdido, about 25 miles from U.S. waters.

Initial estimates put the play's reserves between four billion and 10 billion barrels of crude, adding to other reserve additions in the U.S. part of the Gulf.

"People believe that over the next decade we could see two-to-three million barrels of oil per day being produced from the Gulf of Mexico," Jaffe said.

Gulf of Mexico federal offshore oil production accounts for 23 percent of total U.S. crude oil production, according to the U.S. Energy Information Agency. In the recent past, the offshore and onshore areas of the Gulf region have accounted for more than half of U.S. oil production.

More than 40 percent of total U.S. petroleum refining capacity is located along the Gulf Coast.

But the strategic importance of the Gulf of Mexico goes beyond its contribution to U.S. production, Jaffe said. Historically, the Gulf also has been a development area and proving ground for new offshore technology.

"All the big global players are active in the Gulf of Mexico. New technology comes out of there and is being used in other parts of the world," she said.

And technology might be the biggest story in the Gulf.

"We are at a very pivotal time in energy," Jaffe said. "There are a lot of new technologies being deployed at the same time."

– DAVID BROWN

Pittsburgh Abstract Deadline Arrives Oct. 11

The deadline is near for responding to the call for technical paper and poster abstracts for the 2013 AAPG Annual Convention and Exhibition, which will be held May 19-22 in Pittsburgh, Pa.

The deadline for abstracts is Oct. 11.

The 2013 ACE will be held in the David L. Lawrence Convention Center, marking the first time AAPG has tabbed Pittsburgh as its convention locale.

The meeting theme is "Making the Play With Geotechnology," and technical papers and posters are being sought for 12 themes:

- Global Unconventional Resources (co-chairs, Harris Cander and Randy Blood).
- The Appalachian Basin – A Re-Emerging Giant (Doug Reif and Jim Pancake).
- Emerging Conventional Frontiers (Jeff Bruce and Chris Willan).
- Active Conventional Oil and Gas Fields (Roy Lynch and Ed Rothman).
- Siliciclastics (Rick Abegg and Amy Weislogel).
- Carbonates and Evaporites (Bill Morgan and Taury Smith).
- Energy and the Environment (Daniel Soeder and Shikha Sharma).
- Analysis of Petroleum Systems (Jack Pashin).
- Structural Geology and Neotectonics (Jaime Toro).
- Geophysics and Seismology (William Harbert).
- E&P Technology and Research – The Past and the Future (Tim Murin and Rich Lane).
- AAPG and SEPM Student Posters (Tim Carr and Bosiljka Glumac).

For more detailed information on the themes or on the abstract submission process, go to aapg.org/pittsburgh2013/index.cfm.

Remember, the deadline to submit an abstract is Oct. 11.

GOM

from page 6

How much LNG demand will increase in a shift away from nuclear power, in Japan and elsewhere, can have a significant effect on the future of energy demand.

"You can't analyze the LNG market," she said, "if you can't analyze what energy sources the Japanese people will want 20 years from now."

Flipping the Cards

Jaffe also identified fuel conversion and information digitization as trends that will affect the oil and gas industry in the coming decades.

"We're going to see a lot of change in the industry in terms of conversion – conversion of one fuel into another, conversion of fuels into electricity for transportation," she said.

And digitization and cyber security will be prominent concerns for the industry, Jaffe noted, citing recent cyber attacks in the Middle East. As oil and gas operators transmit digital information, they will have to protect it from competitors and others, she said.

"Then you have the flip side of that, which is the smart grid, which is very enabling technology," she added.

But in the world of wild cards, even the flip side has a flip side.

When utilities can control household electrical use for maximum energy efficiency, "I have to be sure that a hostile government can't do that, just to leave me in a blackout," she said.

One thing Jaffe believes might not make a huge difference in the global outlook is the U.S. presidential election in November.

"I'm not sure it's as significant as people see it," she said.

Despite the candidates' differing positions on climate change, she thinks perceptions of environmentalism and sustainability are related more to age groups than to politics.

"I do believe," she said, "the trend in environmental policy and the trend toward seeing climate as a variable is a generational one."

Ask the Experts

At Rice University, Jaffe teaches a course in sustainable development, as well as one on energy policy. She said her own degree is in Arabic and Middle Eastern history.

"In my first job, before I wrote about oil, I actually wrote about Arab finance," she said.

Jaffe said she has helped develop models of the international oil and gas industry "that involve more than just what's under the ground."

"I tend to look at the intangible issues closely," she explained.

At the GCAGS meeting, Jaffe will be joined on the discussion panel by:

- **Tadeusz Patzek**, professor and chair of the Department of Petroleum and Geosystems Engineering, University of Texas-Austin.
- **Scott Anderson**, senior policy adviser to the Air and Climate Program of the Environmental Defense Fund, Austin.
- **Ken Medlock**, adjunct professor of Economics, Baker Institute for Public Policy, Houston.
- **James H. Painter**, executive vice president-Exploration and Technology, Cobalt International Energy, Austin.

The panel moderator will be past AAPG president Scott Tinker, Texas state geologist and director of the Bureau of Economic Geology, Austin.

Photos courtesy of Midstates Petroleum Co.

Back for more: Horizontal drilling location at Louisiana's West Gordon.

An I-10 line in the sand

Technology, Regulation Changes Boost Wilcox Play

By LOUISE S. DURHAM, EXPLORER Correspondent

Dormant old fields continue to offer lucrative opportunities for operators – particularly those who are up to speed on the latest drilling and completion technologies.

BROEKSTRA

The long-productive Tertiary Wilcox Trend, which extends from south Texas across central Louisiana to the Mississippi border, is one of the latest examples of successful old field rejuvenation.

Newly public Midstates Petroleum Co. has re-entered eight south-central Louisiana Wilcox fields in Beauregard, Allen and Evangeline parishes. The result: significantly revved-up production, via horizontal drilling and multi-stage fracturing.

The Louisiana Wilcox interval measures 3,000 feet to 4,000 feet gross thickness. Depths across the Midstates focus area are 9,000 feet to 17,000 feet.

Among the company's success stories is the oil-prone Pine Prairie field in Evangeline Parish. Pine Prairie, a piercement salt dome, was discovered in 1908 and developed primarily during World War II.

"In the 1940s all the majors were in there, initially drilling shallow wells and then deeper," said AAPG member Brad Broekstra, co-founder and senior geological adviser at Midstates. "The dome only covers pieces of about four sections, and they each had only a small piece of the pie. With the land so fractionated it wasn't worth their while to do a full-scale development of the field.

"Once they began making discoveries in the very lucrative, highly productive fields south of I-10," Broekstra added, "they got out of Pine Prairie, selling their holdings to small independents – what we call mom 'n' pop shops."

A Second Helping

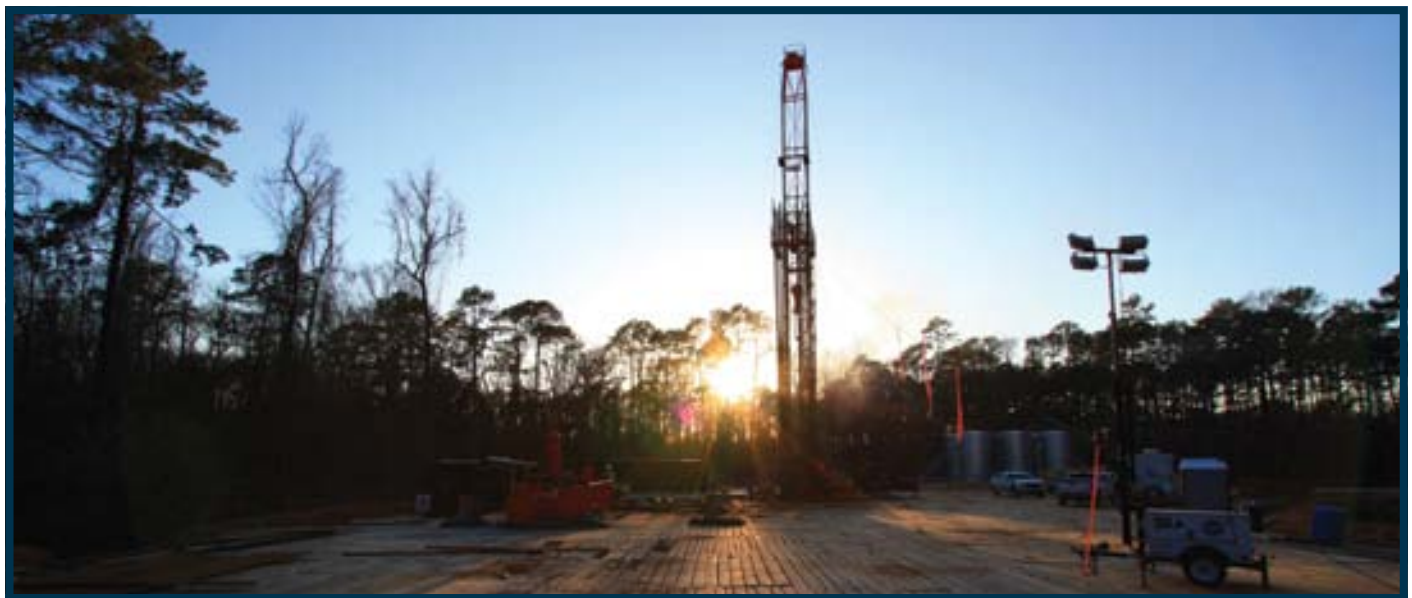
For the Louisiana novice, I-10 has come to represent the geographic boundary between north and south Louisiana for many folks. In large part, the inhabitants of the southern portion of the Bayou State tend to think of this as a nebulous demarcation.

In general, the small entities latching onto the Pine Prairie production lacked the funds to drill additional wells, opting to let the ongoing production continue until it essentially played out.

"This and other fields lay dormant for perhaps 40 years until we came in early in 1998 and started cobbling together these individual positions to do development," Broekstra said. "We did this at Pine Prairie, West Gordon, South Bearhead Creek and other Wilcox fields in the trend.

"We commonly targeted fields discovered by majors," he said. "If they got out before 1973 when we had the oil price spike from $3 to $10, then our presumption was that those fields were probably

See **Wilcox**, page 12



Drilling the oil-prone Pine Prairie field in Evangeline Parish, Louisiana; the field harbors more than 30 productive horizons.

Wilcox

from page 10

underdeveloped."

Midstates drilled its first well in the trend in 2006 at Pine Prairie, which harbors more than 30 productive horizons. The Miocene test well encountered 240 feet of pay at a depth of 2,400 feet.

The company's initial Wilcox horizontal well went down in early 2012 and was followed by four others, with three completions to date and one still drilling.

Broekstra noted that they also have re-entered a number of old wells where the existing casing was large enough to allow them to sidetrack and drill another 2,000 feet to reach the Wilcox.

Success is evident when comparing production increases in the target fields since the program commenced. In Pine Prairie, for example, produced volumes have soared from slightly more than 400,000 barrels in 2006 to 1.2 million in 2011.

Back in the day, the operators did no fracture stimulations and also had downspacing limitations along with other hindrances to development.

"The well log analysis in the Wilcox is challenged at best," Broekstra commented. "The petrophysics make it difficult to tell what's pay and what isn't.

"To overcome that, we're drilling in known productive fields doing multi-stage fracturing, and we're able to commingle the Wilcox sand production," he said. "The old-timers would perf and produce one sand until it was uneconomic and then pop the next zone; they couldn't commingle because of the state regulations, which have now been relaxed."

Midstates is utilizing extensive 3-D data with the intent to use 3-D for development throughout the program. The company is shooting 265 square miles of 3-D, with the goal eventually to cover each of its fields. A part of this is already complete and in hand.

Less (Complexity) Is Good

There's a good geologic reason why horizontal wells will lead the way in this current stage of development.

The upper, middle and lower Wilcox sands are comprised of significant clay and shale content and have been classified as "dirty sands." These respond quite well to laterals and fracture stimulation.

Midstates operates 121 wells in the trend, with more than 1,000 prospective locations on its existing acreage.

Broekstra emphasized that the company zeroed in on the onshore upper Gulf Coast early on because it recognized that it is repeatable and there are somewhat predictable investment opportunities.

The sands are laterally extensive, and the geology is relatively simple compared to south of I-10.

"This is not South Louisiana," Broekstra proclaimed emphatically. "The geology is far less complex.

"There are large three-way and four-way anticlines, and some of the structures are 5,000 acres," he noted. "That's as big as an OCS block, and maybe three wells were drilled on them until we got there.

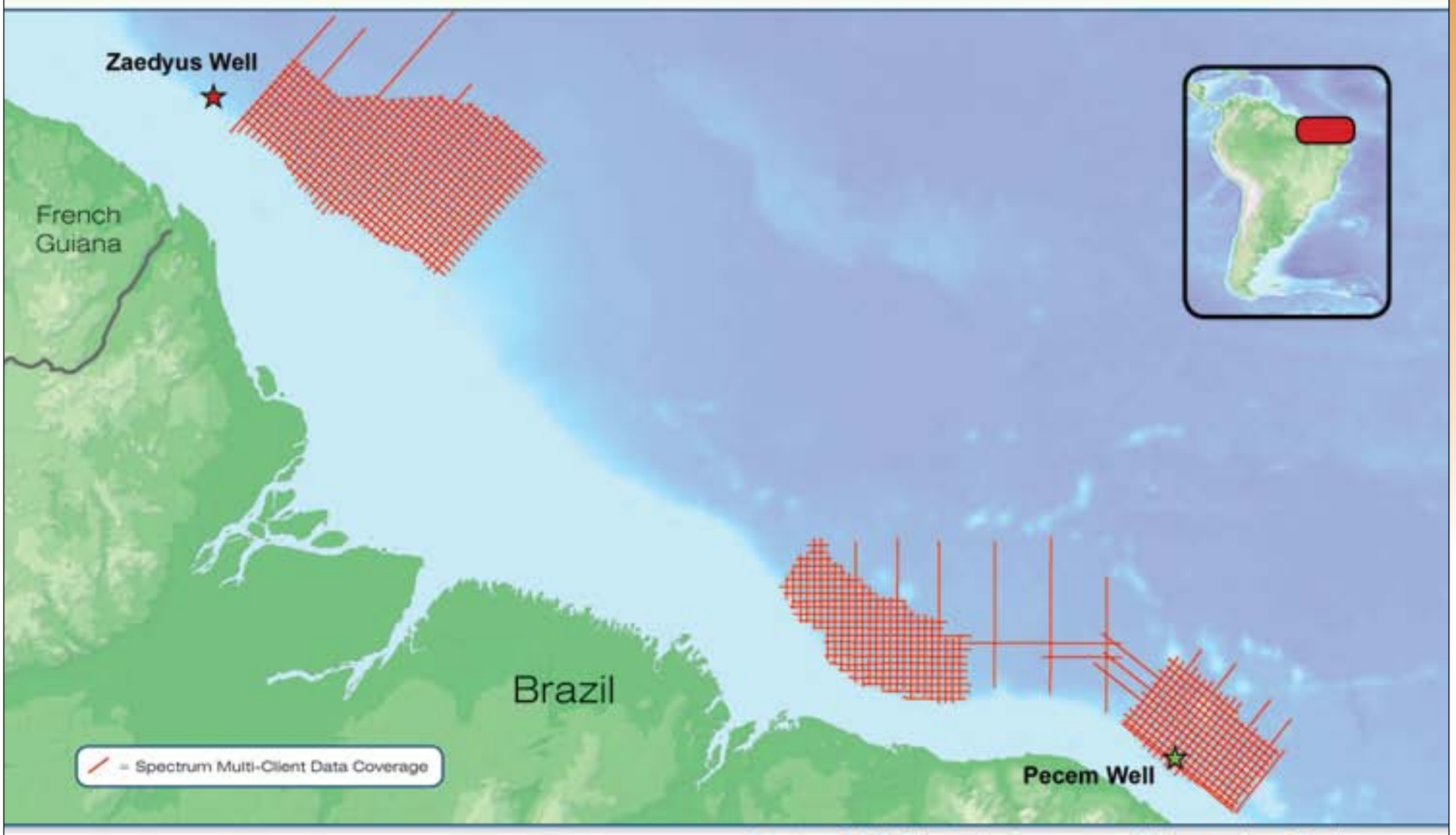
"Also, these tend to be depletion drive reservoirs.

"South of I-10, the reservoirs are more compartmentalized, more complex and typically waterdrive," he noted. "We call them 'one-offs,' because there aren't many offset locations once you make a discovery.

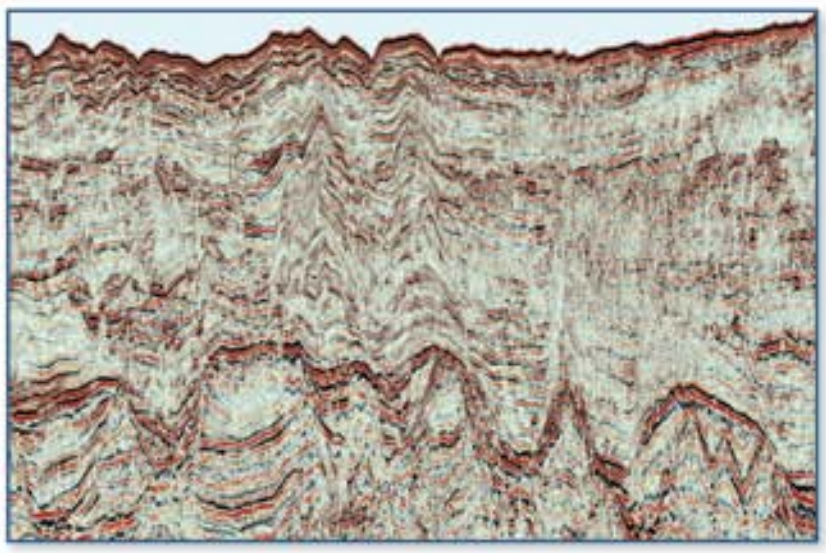
"However, on these 5,000-acre Wilcox structures," Broeskstra said, "you can drill a whole lot of wells at 40-acre spacing."

Equatorial Margins Brazil

Multi-Client Seismic - Amazonas, Ceara and Barreirinhas Basins



Spectrum Multi-Client seismic coverage offshore northern Brazil



Canyon Features from Foz do Amazonas Survey

Spectrum is active in three basins along the Equatorial Margins of Brazil, and acquisition is complete on each of the Ceara, Barreirinhas and Foz do Amazonas surveys. Following completion of these surveys in the third quarter of 2012, Spectrum has collected over 28,000 kms of new, long offset data over these highly perspective areas.

Final PSTM data is available for both the Ceara and Barreirinhas surveys, and will be available for the Foz do Amazonas program beginning in October, 2012.

All of these surveys have been acquired with 10,000 m offsets and 13 second record lengths.

Companies participating in Spectrum's new seismic programs will have a competitive advantage in the upcoming Bid Round 11.

Spectrum

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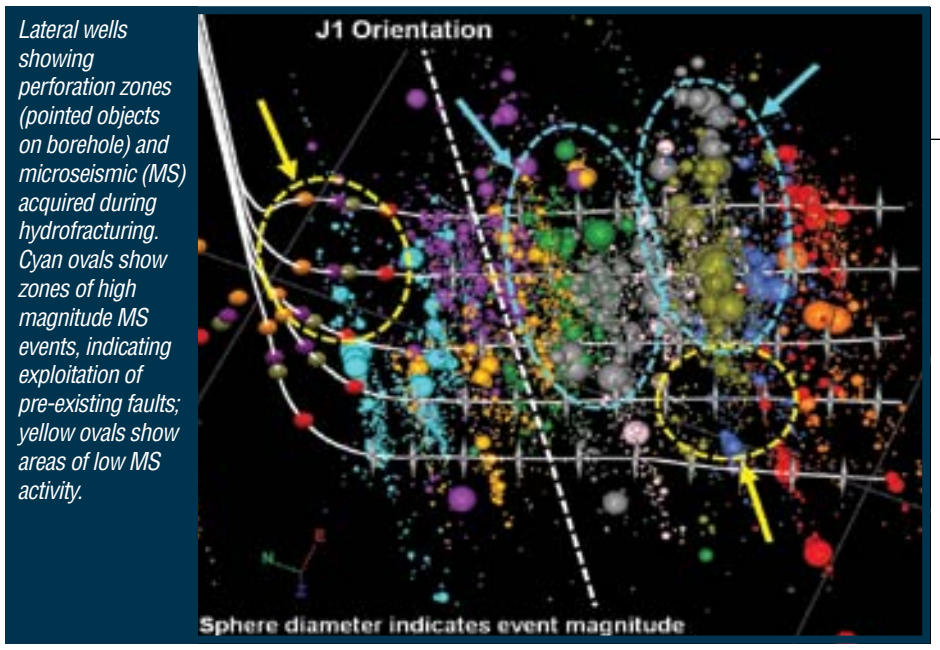


Lateral wells showing perforation zones (pointed objects on borehole) and microseismic (MS) acquired during hydrofracturing. Cyan ovals show zones of high magnitude MS events, indicating exploitation of pre-existing faults; yellow ovals show areas of low MS activity.

Making connections

Eagle Ford, Meet Marcellus

By LOUISE S. DURHAM, EXPLORER Correspondent

Unconventional oil and gas reserves and production have significantly changed the energy game in North America – and for the most part this turnabout in domestic E&P has come from shale zones, which have been long recognized as source rocks for other reservoirs.

Now that many hydrocarbon-rich shales are the targets of the drill bit, geoscientists are working diligently to develop new approaches and technologies to better understand and produce them.

Horizontal drilling and multi-stage hydraulic fracturing have been key to economic development of these rocks.

These are the newsmakers that the public reads about.

There's a raft of "behind the scenes" advanced technology applications that long precede the drilling stage. After all, these zones tend to be considerably more esoteric than the ordinary sandstone reservoir – or even the unconventional tight sandstone target.

Competent assessment of unconventional prospects demands integration of geology, geophysics, geomechanics, petrophysics and engineering, according to AAPG member Scott Singleton, ResSCAN technical manager GeoVentures group at ION Geophysical Corp.


SINGLETON

He succinctly summarized what each of these disciplines brings to the table:

- Geology: Provides a regional stratigraphic and structural framework.
- Petrophysics: Supplies baseline rock property data from both logs and cores.
- Geophysics: Provides a means to extend the petrophysical rock property data away from the wellbore.
- Geomechanics: Describes the stress state both locally and regionally.
- Engineering: These data follow the other data usage and delineate the results of drilling, completion and production.

"All of these data types are essential to piecing together a complete reservoir assessment," Singleton emphasized.

Looking at the Marcellus

He also noted that considerable attention has been directed to modifying the traditional conventional geophysical reservoir characterization workflow, to offer useful outputs to integrated asset teams in unconventional resource plays. These teams typically are comprised of both reservoir and drilling engineers.

"With this serving as the impetus, geophysicists are consolidating their efforts in four principal areas," Singleton noted.

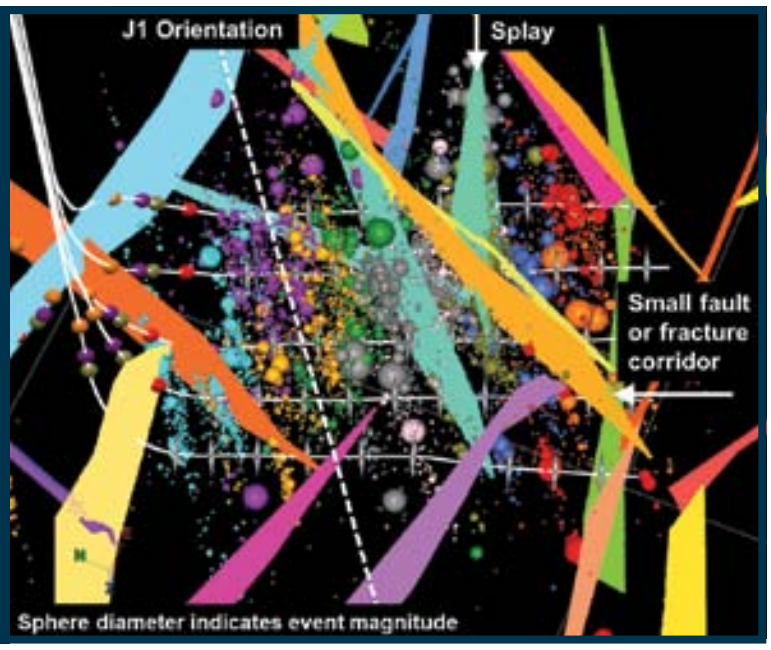
These are:

- Prediction of anisotropy from full azimuth data.
- Prediction of rock properties along the Vfast azimuth, or the true rock properties, which have minimal distortion owing to vertical fractures.
- Prediction of the three principal stresses.
- Fracture characterization.

Singleton said they have adopted this philosophy in their unconventional reservoir characterization workflow, where geophysics alone is insufficient to delineate true rock properties, the same as with conventional reservoir characterization.

Using the workflow they formulated, he and his colleagues conducted a study

See **Shales**, page 16



Automatically mapped faults integrated with the MS data and borehole locations shown in the figure on page 14. Each fault is shown in a randomly-generated color. Large MS events preferentially align along a fracture corridor and along one of the splays off of this corridor.

Shales
from page 14

focused on a Devonian-age Marcellus shale prospect in Pennsylvania.

Singleton pointed out this effort was undertaken while he was at RSI.

The study results demonstrate that petrophysics, rock physics, geophysics and geology can successfully be integrated with reservoir and production engineering to characterize shale reservoirs.

Digging down, each data type yields information typically not provided by the others.

"The project objective was to determine production drivers at the wellbore using all available data and then to extrapolate this set of criteria away from the wellbore using only seismic data and its derivatives," Singleton said.

"The results showed that rock brittleness and also pre-existing fractures can impact well production," he noted. "Additionally, they showed that a comprehensive suite of fracture characterization methods, such as anisotropy and principal stresses, are necessary to effectively determine if a pre-existing fracture zone will reopen or stay closed when being subjected to hydraulic fracturing in this area."

He asserted that a more robust method might be to incorporate reservoir quality data in the production prediction, e.g. gas-in-place, porosity and thickness.

Eagle Ford Comparisons

Over the course of the Marcellus study, Singleton had an "aha!" moment – involving an area far removed geographically from Pennsylvania.

"In addition to the Bakken, the production statistics available show that the Marcellus and the (Cretaceous-age) Eagle Ford in south Texas are the hottest shale basins in the United States," he said. "Even a peripheral observation of these two basins indicates there's a bunch of similarities.

"My immediate thought was, 'hmm, I wonder if the analytical techniques I developed for the Marcellus are applicable to the Eagle Ford?'" Singleton said.

"I've seen others do exactly the same thing on the Eagle Ford that I did on the Marcellus," he continued. "We've shared techniques, so I know we're both going down the same path – I've seen their results, and they've seen mine."

Singleton assembled a list of comparisons and contrasts between the Marcellus and the Eagle Ford (EF):

▸ Similarity: Depositional Environment

✓ Both units are underlain by a hard limestone that represents a regressive systems track, culminated by maximum regressive surface. These units are the Onondaga (Pennsylvania) and Buda (Texas).

✓ The base of each shale unit is a condensed section representing a transgressive systems track, culminating in a maximum flooding surface, which corresponds to the maximum organic content (MOC) due to restricted circulation and reducing conditions with low sediment input.

✓ Above the base of each shale unit is one or more regressive/transgressive system track pairs, eventually leading to lower sea levels and oxygenated conditions with mixed carbonate/clastic deposition (Tully – Pennsylvania, Austin Chalk – Texas).

▸ Difference: Lithology

✓ Marcellus – siliceous shale and silt, finely layered but mostly siliceous. EF – fine carbonate/shale interbeds, overall lithologic description of a marl. More and thicker organic shale beds in Lower EF, more and thicker limestone beds in Upper EF.

▸ Difference: Structure

✓ Marcellus – Structurally sits on the Appalachian forefront, and fracturing is prevalent and complex. Dominant J1 fracture system to the northeast (about 60 degrees), secondary J2 fracture system nearly orthogonal to J1. Less developed in the southern portion and likely sealed with calcite. More developed in the

See **Eagle Ford**, page 20

Some are calling it Louisiana Eagle Ford

Nuisance Zone Becomes Oil Target

By LOUISE S. DURHAM, EXPLORER Correspondent

Oil appears to be in no imminent danger of losing its current designation as "King of The Patch," given the continuing lofty price per barrel.

In stark contrast, natural gas just can't get any respect these days.

Even the recent Hurricane Isaac elicited little more than a collective yawn from the commodity traders as it made a slow trek across the Gulf of Mexico with its considerable gas production.

The ongoing high oil price makes a slew of drilling targets attractive, including some long-tantalizing yet elusive ones.

A striking example is the new/old Tuscaloosa Marine Shale (TMS) play in central Louisiana.

The Cretaceous-age TMS extends across at least 2.7 million acres in the Bayou State and into southwestern Mississippi. The shale occurs between the upper and lower units of the Tuscaloosa formation, which has produced tremendous volumes of hydrocarbons from fields in the famed Tuscaloosa Trend, including the dynamic Port Hudson, Judge Digby, Morganza and others.

Production comes from the lower Tuscaloosa Massive Sand facies.

It's generally thought that the deep, high-pressure TMS sourced the highly productive sands in the Tuscaloosa Trend.

BARRELL

> "It's been proven the reservoir can flow at high rates. We've had two wells at just over 1,000 barrels a day ..."

Even so, the TMS was long considered to be a nuisance zone when the drill bit penetrated. On occasion it would throw oil, which captured the attention of geoscientists over the years.

Early attempts to produce the TMS in the 1970s failed to yield commercial results. However, the last hole drilled in 1977 in northern Tangipahoa Parish continues to kick out a few bopd even today.

Sleeping Giant Ready to Awaken?

Current high interest in the TMS can be traced principally to a 1997 study estimating seven billion barrels of oil awaiting recovery. The study and resulting publication originated at Louisiana State University's Basin Research Institute, which now is the Basin Research Energy Section of the Louisiana Geological Survey.

Owing to the study's conclusions, the TMS might best be viewed as a sleeping giant all set to waken with a roar via modern sophisticated technologies, including horizontal drilling and multi-stage hydraulic fracturing.

The now-official play is still relatively new, coming to the fore around 2008 when the former Encore Acquisition drilled four horizontal wells, which encountered varied problems.

The estimated seven billion barrel carrot has attracted some high profile companies who have snapped up considerable acreage:

- Encana – 355,000 acres.
- Devon – 316,000 acres.
- Indigo Minerals – 250,000 acres.
- EOG – 200,000 acres.
- Goodrich Petroleum – 132,000 acres.
- Halcon Resources – 55,000 acres.

As of the end of August there had been 13 completions reported in this current era of the play, according to AAPG member Kirk Barrell, president of The Woodlands, Texas-based Amelia Resources, which generates prospects and seeks out partners.

Barrell, who has presented at various professional societies about the play, has become a go-to source of information via his continuing blog on all things TMS.

Having worked this general part of the world for 23 years, he has significant insight into the current happenings.

"It's been proven the reservoir can flow at high rates," Barrell said. "We've had two wells at just over 1,000 barrels a day and have proven a completions strategy.

"We're still waiting to see what the declines look like because we don't have many wells that we've seen 12 months production on," he emphasized. "So the jury is still out on the decline rate."

He noted the biggest hurdle now is well costs in the range of $13 million to $15 million, with the target range being perhaps $10 million to $11 million. The average TVD is about 12,500 feet, with the focus being on the updip oil window rather than the much deeper gas window.

Barrell asserted that there's no question the TMS play has staying power.

"All plays' costs start off high and reduce through time as best practices get defined, and I have no question this play will be the same," he said. "We have a great group of operators bringing a lot of expertise in the horizontal realm who will figure out how to get the drilling and production costs down."

See **Tuscaloosa**, page 20

Tuscaloosa
from page 18

'Louisiana Eagle Ford'

The relatively recent arrival of EOG, with its finely honed Eagle Ford shale expertise in Texas, sparked still more optimism that this play is the Real Deal.

In west-central Louisiana, the TMS is referred to as the Louisiana Eagle Ford by some operators. They note that it is similar in age and lithology to the highly productive, liquids-rich Cretaceous-age Eagle Ford interval in Texas.

This can make for a good marketing tool, but it does raise some eyebrows.

Barrell said most players hope to get everyone to clarify this because it's the same exact play and the same stratigraphic interval. He did point out that the TMS has higher resistivities to the east, which may indicate more hydrocarbon saturation.

Indigo Minerals has drilled in the western part of the TMS without yielding production, and Halcon is leasing and permitting nearby, according to Barrell.

Devon's seven wells, including an initial vertical pilot well, have been drilled to the east, principally in St. Helena and Tangipahoa parishes with a recent sojourn into West Feliciana Parish. Its most recent well at 13,700 feet TVD is the deepest to date in the play; initial potential was due to be announced at press time.

The next several months could tell an impressive story, particularly as the EOG well results begin coming in.

Additionally, Devon appears poised to become more aggressive in that it reportedly announced recently that future wells will be 8,000-foot laterals, meaning proppant use and fracturing jobs will increase.

Looking Ahead

In case you're wondering about the role of 3-D in the play, Barrell noted that the major players likely are biding their time on this until they have the play to a commercial level. He anticipates that a large 3-D program will kick off when that occurs.

Barrell emphasized that within the next six months or so more decline rate info will be available.

"This play could be very large," he enthused. "It's oily, it covers a large geographic area and we have very good operators – and it's a place where a lot of hydrocarbons have been found before.

"We think this very viable play will be proven to be commercial in 2013," he added.

Eagle Ford
from page 16

northeast and likely open, thus causing loss of containment during fracturing operations.

✓ EF – Structurally sits on the passive Gulf Coast margin. Dominant fractures are growth faults parallel to the coast from tectonic subsidence – thus, they're often not well developed. Sealing is via calcite, similar to the host rock.

▸ Difference: Fracture Characterization

✓ Because of the differences in structural setting, horizontal velocity anisotropy can be high in the Marcellus (>15 percent) but is often low or can be nonexistent in the EF. This has implications on the use of full azimuth seismic surveys for reservoir characterization.

✓ Vertical velocity anisotropy is high in both formations due to fine layering of shales. This needs to be accounted for and removed from pre-stack seismic gathers prior to any analytical work.

✓ Post-stack fracture-sensitive seismic attributes (coherence, curvature, instantaneous dip, dip azimuth) still work well in both formations. Combined with neural networks, etc., fractured sediment 'facies' can be identified and mapped. These are then related to other geophysical, petrophysical and engineering features.

▸ Similarity: Reservoir Characterization

✓ Both units conform to the "Oreo cookie" model (hard limestone bounding soft, high-TOC shale), so the acoustic signature will conform to the same principles. Pre-stack simultaneous inversion will generate acoustic impedance, shear impedance and density volumes, from which reservoir properties can be calculated and calibrated with well control.

✓ Final outputs can be either rock properties (such as lithology or porosity) or engineering properties, including Young's Modulus (measure of elasticity of a rock or other material), Poisson's Ratio (measure of how a rock is going to deform in one area relative to another) and brittleness.

GCAGS Meets Oct. 21-24 in Austin

"Solving for E3" is the theme for this year's annual meeting of the Gulf Association of Geological Societies and the Gulf Coast Section of SEPM, set Oct. 21-24 in Austin, Texas.

"E3" refers to energy, environment and economy, and the meeting's technical program will feature all aspects of the theme with papers that focus on a variety of plays and areas, including:

- Shales in the Gulf Coast Region.
- The Eagle Ford Shale.
- The Tuscaloosa Marine Shale Play.
- The Haynesville Shale Play – Perspectives.

The convention also will offer an exhibits hall, short courses, field trips, entertainment activities and four luncheons, including the All Convention Luncheon on Monday, Oct. 22, featuring William Maloney, executive vice president of Statoil, talking about "Ideas to Profits."

To register of for more information go to the website at gcags2012.com.

AAPG member Stephen Shirley and his wife, Natalie, who help battle human trafficking via an initiative they helped start called NightLight.

Riding to the rescue

Seeing Despair, Offering Hope

By BARRY FRIEDMAN, EXPLORER Correspondent

Human trafficking is the fastest growing criminal enterprise in the world.

Read that again.

More than drugs, more than laundered money, more than illegal arms – it's the owning and selling of human beings that is keeping international law enforcement officials the busiest.

And according to the organization Doctors at War, of the more than 27 million trapped in this new slavery, 13 million of them are children – and by children, they mean between the ages of 12-17, with 12-14 being the average age of entry into the sex trade.

As awful and as daunting as it is, you might be wondering, why am I reading about this in a geology magazine?

Because one of our own – AAPG member Steven Shirley, a manager in Earth Science Technical Relations at Chevron Global Upstream and Gas in Houston – is trying to do something about it.

"We became aware of the issue when we lived in Thailand," Shirley said of he and his wife, Natalie, "and we realized it was a domestic issue as well as an international one when we came back to the states."

But the couple's sensitivity to the debasing world of human trafficking had its roots in Bangkok, where they were based from 2001-08. They were horrified – and, paradoxically, perhaps, inspired to wade into that world, in an attempt to make a difference.

The desire became a reality when Natalie and four of her friends started NightLight International in Bangkok, to "find a way to combat human trafficking," Shirley said.

The mission is the same: To effect change within the global sex industry, which is a polite way of saying its job is to locate and rescue those in slavery.

Once that occurs – and it's no small feat – NightLight then offers intervention, training, jobs … and hope.

"She (Natalie) and her cohorts are definitely the stars here, not me," Shirley insisted. "I am on the advocacy, support and sweat labor side of the equation."

He is modest.

But Natalie elaborates: There was a woman – "I want to call her 'K,'" she said – who the couple encountered in Thailand who for the longest time would rescue other girls there, but would not leave the trade herself.

"Eventually, she did," Natalie said, "but that woman was quite an influence on me and my husband."

> **The victories are measured, literally, one child at a time.**

The Girl Next Door

The human trafficking numbers are staggering – internationally, in the United States and, particularly, in Houston.

Approximately 20,000 of those who are trafficked every year come into the United States – many through Texas. The Department of Justice says the state – in large measure because of U.S. Interstate 10, which dissects the state east and west and is the country's fourth-longest interstate highway – is the number one route for human trafficking.

In 2007, 30 percent of the calls received by the National Human Trafficking Hotline were out of Texas, and 25 percent of all international victims certified by the U.S. Department of Health and Human Services were in Texas.

More troubling, right now it is estimated that between 8,000 and 24,000 American children are enslaved in Texas. And make no mistake, when you're talking human trafficking, you're talking sexual slaves who are children.

Where do victims come from? In this country, many times, from next door. According to National Incidence Studies of Missing, Abducted, Runaway and Throwaway Children, there are over 6,000 runaways in Houston.

See **NightLight**, page 24

Natalie Shirley (in pink, third from left) and some of women involved in the NightLight initiative.

NightLight

from page 22

And that, Shirley says, is a problem – and often it's the first problem.

"One of every three children who run away is lured into sex trafficking within 48 hours of leaving home," he said.

So where does one begin to address a problem so overwhelming?

"They started," Shirley said of Natalie and her friends, "with a box of beads and one girl in a McDonalds."

The beads are important, for one of the ways the organization helps these girls, as mentioned, is providing them skills, getting them jobs – in this case, making jewelry.

"The challenges are mostly financial," Shirley said. "Women in Thailand support their families – that's the culture – so rescuing girls (there) from the sex trade without giving them another option of support is only half the battle.

"And that is why, for example, the jewelry is so important," he said. "It provides that."

Helping Hands

And little by little, a job here, a success there, the program grows. In the United States, NightLight, which has been featured in a National Geographic special on trafficking, is now in Atlanta, Branson, Mo., and Los Angeles, and has between 60-80 survivors employed in Thailand making jewelry."

"The reason there is a location in Branson has to do with the tourist industry in that part of Missouri, and it's a poor area that lends itself to such trafficking," Natalie Shirley said.

"There's no NightLight in Houston because Redeemed Ministries is there," she adds. "We work with them, because I thought the efforts would just be redundant."

The organization's heart, though, is in Houston, because that's where Steven and Natalie Shirley are.

"My employer Chevron has been gracious to match some of my financial donations as well as match my donated times with cash donations through the Chevron's Humankind program, which encourages volunteerism and involvement in the employees community," Steven said.

Additionally, the Shirleys work with three groups:

- NightLight (www.nightlightinternational.com).
- Redeemed Ministries (www.redeemedministries.com), which is an all-volunteer organization that includes a holistic approach to outreach, aftercare and advocacy.
- Freedom Place (www.freedomplaceus.org), which provides a comprehensive place for care and recovery for underage female victims of sexual abuse.

For Steven Shirley, the victories are measured, literally, one child at a time.

"Prior to Freedom Place opening this year," he said, "there were only 80 beds in the United States dedicated to domestic minor victims of trafficking."

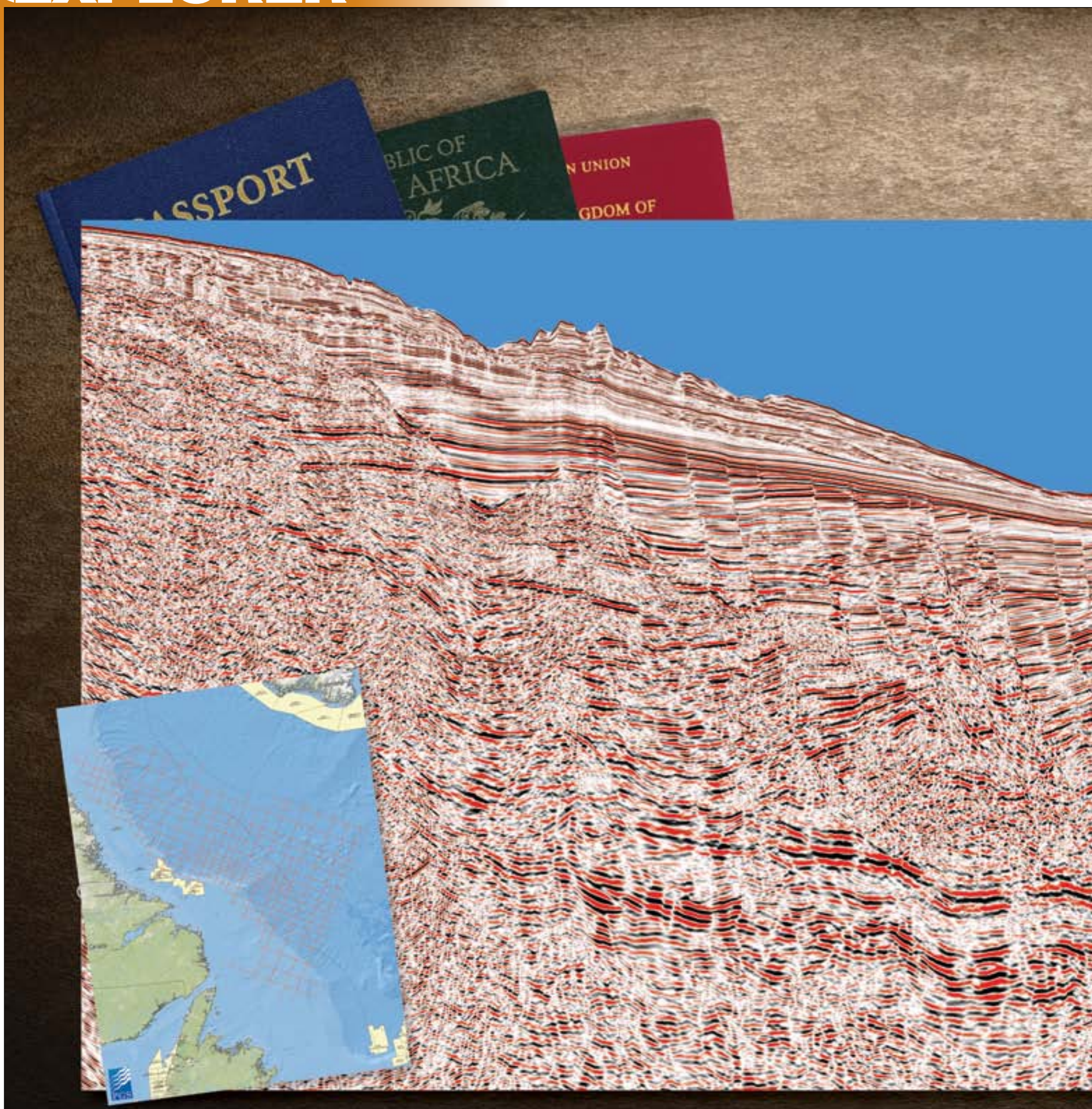
Obviously, he does this work to do good, to right a wrong, to give something back.

But it's also a way to remember his father.

"My dad who was a geologist taught me that you should never be satisfied with sitting on the sidelines," he said, "but we should wade in.

"He instilled his service and volunteer ethic in all, as he didn't just talk the talk but he walked the walk."

The son listened.



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Welte to Receive Sidney Powers Award

By SUSIE MOORE, Communications Project Specialist

Dietrich Welte, a leader in the research and development of the concept and software used in 3-D numerical basin and petroleum system modeling, and author of the first comprehensive textbook used in the field of geochemistry, has been named the 2013 recipient of the Sidney Powers Memorial Award – AAPG's highest honor.

Welte is a retired Professor Emeritus from Technical University RWTH, Aachen, Germany, and adjunct professor from Jacobs University in Bremen, Germany – a university he helped initiate.

Joining Welte at the top of this year's AAPG awardees list is Stephen A. Sonnenberg, Boettcher Distinguished Chair of Petroleum Geology at Colorado School of Mines, Golden, Colo., who has been named the winner of this year's Michel T. Halbouty Outstanding Leadership Award.

Welte and Sonnenberg are among the 45 award winners who have been announced by AAPG and who will be recognized at the opening session of the 2013 AAPG Annual Convention and Exhibition, set May 19-22 in Pittsburgh, Pa.

AAPG awards, approved by the Executive Committee, are presented annually to recognize individuals for service to the profession, the science, the Association and the public.

Welte began his career with Shell International as a research geochemist in 1959. Three years later he returned to his alma mater, University of Würzburg, Germany, where he worked four years.

In 1967 he returned to the industry as a senior research geochemist for Chevron Oil Field Research (USA).


WELTE


SONNENBERG

Welte's textbook, "Petroleum Formation and Occurrence," first published in 1978 and expanded in 1984, is still used today in teaching petroleum geochemistry.

He founded the Institute of Petroleum and Organic Geochemistry at the then Kernforschungsanlage, now Forschungszentrum Jülich, in Germany in 1979, and later founded and was director of Integrated Exploration Systems in 1985.

Welte's list of AAPG accolades include recipient of the President's Award (1966), International Special Commendation Award (2000), Special Award (2004) and Distinguished Service Award (2006).

Sonnenberg, who is the seventh recipient of the Halbouty Outstanding Leadership Award, given in recognition of outstanding and exceptional leadership in the petroleum geosciences, received AAPG Honorary membership in 2008.

He has been actively involved in AAPG leadership roles over the last three decades, serving four times on the AAPG Executive Committee – as vice president in 1995-96, and as president-elect/president from 2002-04 and as House of Delegates chair 2009-10 – as well as serving on various committees.

Interviews with both Welte and Sonnenberg will be published in a future EXPLORER. Biographies and citations of all award winners will be included in a future BULLETIN.

Award winners announced by AAPG and who will be honored along with Welte and Sonnenberg in Pittsburgh are:

Honorary Member Award

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

❒ **Abdulla A. Al Naim**, Aramco, Dhahran, Saudi Arabia.

❒ **Jeanne E. Harris**, G&H Production, Denver.

❒ **Kenneth E. Peters**, Schlumberger Information Systems, Mill Valley, Calif.

❒ **Daniel J. Tearpock**, Subsurface Consultants, Houston.

Norman H. Foster Outstanding Explorer Award

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

❒ **William A. Zagorski**, Range Resources, Caraopolis, Pa.

Robert R. Berg Outstanding Research Award

Presented to honor a singular achievement in petroleum geoscience research.

❒ **Ronald A. Nelson**, Broken N Consulting, Cat Spring, Texas.

❒ **J. Frederick Sarg**, Colorado School of Mines, Golden, Colo.

Distinguished Service Award

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

❒ **Eugene L. Ames III**, Ames Energy Advisors, San Antonio.

❒ **Mark J. Gallagher**, Encana USA, Plano, Texas.

❒ **Frances J. Hein**, Alberta Energy Resources Conservation Board, Calgary, Canada.

❒ **Joseph J. Lambiase**, Chulalongkorn University, Bangkok, Thailand.

❒ **Stephen D. Levine**, SK E&P, Houston.

❒ **Brian E. Lock**, University of Louisiana, Lafayette, La.

❒ **Richard A. Lorentz Jr.**, KrisEnergy, Singapore.

❒ **William C. Stephens Jr.**, Mid-Con Energy Group, Dallas.

❒ **Linda R. Sternbach**, Star Creek Energy, Houston.

❒ **Laura C. Zahm**, Bureau of Economic Geology, Austin, Texas.

Grover E. Murray Distinguished Educator Award

Presented for distinguished and outstanding contributions to geological education, both at the university level and

See **Awards**, page 30

Awards
from page 28

toward education of the general public.

❒ Carlton E. Brett, University of Cincinnati, Cincinnati, Ohio.

❒ John R. Underhill, University of Edinburgh, Edinburgh, Scotland.

Harrison Schmitt Award

Presented in recognition of outstanding accomplishment that is beyond the scope of other AAPG awards.

❒ George B. Asquith, Texas Tech University, Lubbock, Texas.

❒ Martin G. Lockley, University of Colorado at Denver.

Public Service Award

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

❒ Alex S. Broun, retired Exxon, Dripping Springs, Texas.

❒ Jerome J. Cuzella, consultant, Lakewood, Colo.

❒ Donald S. Van Nieuwenhuise, University of Houston, Houston.

Pioneer Award

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

❒ Robert E. Fox, Term Energy, Lexington, Ky.

❒ Paul R. Lamerson, consultant, Lakewood, Colo.

Wallace E. Pratt Memorial Award

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

❒ Andrew C. Aplin and Joe H.S. Macquaker, for "Mudstone Diversity: Origin and Implications for Source, Seal and Reservoir Properties in Petroleum Systems," which appeared in the December 2011 BULLETIN.

Aplin is with NRG, School of Civil Engineering and Geosciences, University of Newcastle, Newcastle-Upon-Tyne, United Kingdom; Macquaker is with ExxonMobil, Spring, Texas.

Robert H. Dott Sr. Memorial Award

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

❒ Ken McClay, John Shaw and J. Suppe for "AAPG Memior 94: Thrust Fault-Related Folding."

McClay is with University of London, Surrey, England; and Shaw is with Harvard University, Cambridge, Mass.

J.C. "Cam" Sproule Memorial Award

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

❒ Peter E.K. Deveugle (co-author), for the AAPG BULLETIN paper "Characterization of Stratigraphic Architecture and Its Impact on Fluid Flow in a Fluvial-Dominated Deltaic Reservoir Analog: Upper Cretaceous Ferron Sandstone Member, Utah."

❒ Klaas Verwer (co-author), for the AAPG BULLETIN paper "Effect of Pore Structure on Electrical Resistivity in Cabonates."

Deveugle is with Chevron ETC, Perth, Australia; Verwer is with Statoil ASA, Bergen, Norway.

John W. Shelton Search and Discovery Award

Presented in recognition of the best contribution to the "Search and Discovery" website in the past year.

❒ Anne Grau and Robert Sterling for the paper "Characterization of the Bakken System of the Williston Basin From Pores to Production; The Power of a Source Rock/Unconventional Reservoir Couplet."

Grau is with Fidelity Exploration Co., Denver, and Sterling is with Cirque Resources, Denver.

George C. Matson Award

Presented to honor and reward the best oral presentation at the 2012 AAPG Annual Convention and Exhibition in Long Beach, Calif.

❒ Jonathan Allen, for the paper "Improved Reservoir Characterization at Kern River Field, California, USA: New Insights Into an Old Field Using 4-D Saturation Modeling." Allen is with Chevron, Bakersfield, Calif.

Allen's co-authors are Dave Larue, with Chevron, Newport Beach, Calif.; and Dale Beeson, with Chevron Perth, San Ramon, Calif.

Jules Braunstein Memorial Award

Presented to honor and reward the best poster presentation at the 2012 AAPG Annual Convention and Exhibition in Long Beach, Calif.

❒ Simon Campbell, Stanislaw Mazur, Nicola Henshaw, Ahmed Salem, Adriano Sebastiao, Jane Saweka and Artur Oliveira, for the poster "Kwanza Basin: Sub-Salt Basin Structure and Sediment Thickness from Integrated Analysis of High Resolution Aeromagnetic Data."

Geosciences in the Media Award

Presented for notable journalistic achievement in any medium, which contributes to public understanding of geology, energy resources or the technology of oil and gas exploration. Granting of this award in any year is discretionary.

❒ Kirk Johnson and Ray Troll for "Cruisin' The Fossil Freeway – An Epoch Tale of a Scientist and an Artist on the Ultimate 5,000-Mile Paleo Road Trip." The book, written and illustrated by the pair, describes their 5,000-mile journey throughout the American West.

Johnson is with the Denver Museum of Nature & Science, Denver, and Troll is a "fin" artist living in Ketchikan, Alaska.

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 geology and 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.

00-000 Frontispiece (Map 1): Generalized Geology of the Area of "The Reckoning", Modified from American Association of Petroleum Geologists, Geological Highway Maps of Texas (1979), and Bureau of Economic Geology, Report of Investigations No. 65, Lower Cretaceous Stratigraphy, Northern Coahuila, Mexico, by C. I. Smith (1970), with permission.

HISTORICAL HIGHLIGHTS

Geology Was Factor In Frontier Texas Life

By PETER R. ROSE

Most papers about the history of geology concern evolution of concepts or sequences of events. This paper turns that on its ear – it shows how geology can influence history.

* * *

The Edwards Plateau is an immense, high-standing tableland that covers more than 25,000 square miles of west-central Texas, the geomorphic expression of the thick, resistant Edwards Limestone. Rainfall tends to sink into the permeable limestone terranes on top of the plateau, rather than run off. Because the Trinity-age mudstone formations underlying the porous Edwards Limestone mass are relatively impervious, ground water accumulates in the lower part of the Edwards, forming an extensive regional aquifer up to 300 feet thick.

This ground water is the source of all the springs around the margins of the plateau.

The consequences of this geology are unusual: a vast, elevated, waterless plain, dissected around its serrated margins by deep, limestone-cliffed canyons, each fed by perennial springs that form the headwaters of all the rivers in central and south Texas, save the Pecos and the Rio Grande.


ROSE

This singular geologic/geomorphic/hydrologic combination exerted a profound influence on settlement and development of the region during the late 19th century. All frontier settlements were proximal to perennial, spring-fed streams – but the Edwards Plateau itself, because of its rugged margins and the absence of dependable surface water, constituted a formidable wilderness barrier to permanent habitation.

Early road networks mostly went around the plateau, and the Western Beef Trail skirted its eastern margins. During the 1870s, marauding Indians raiding southeastward from the High Plains and northeastward from Coahuila utilized the flat, thick-turfed plateau uplands as wilderness pathways to fall suddenly upon unsuspecting settlements around the margins of the plateau, thus inhibiting permanent Anglo settlement.

In 1873, the U.S. Army began to suppress raiding into Texas by Comanche and Kiowa Indians from Indian Territory (now Oklahoma). Even though Kickapoo and Lipan Indians continued to raid from safe-havens in northern Mexico, opportunistic Anglo-Celtic cattlemen and homesteaders began settling the wide apron of open, stream-laced lands that bordered the Edwards Plateau on the east.

Family-based criminal confederations also were attracted to such isolated locations because of the sparse populations, lack of organized government and law, proximity to clandestine livestock markets along the Mexican border and the adjacent wilderness as a waiting refuge from pursuing lawmen.

See **Edwards**, page 34

This summary is fully developed as a documented history in "The Reckoning: The Triumph of Order on the Texas Outlaw Frontier," by Peter R. Rose, released by Texas Tech University Press in September.

Edwards
from page 32

The Wild Bunch

Isolated by geology and by-passed by history, the canyon lands around the forks of the Llano River – in unorganized and lawless Kimble County – provided an ideal location for such a tribal confederation of frontier outlaws beginning in 1874.

They preyed on neighboring settlers, north-bound trail herds and stock raisers in adjacent counties, sometimes disguised as Indians.

Outnumbering and intimidating law-abiding settlers, they took over the Kimble County government shortly after it was organized in 1876.

Starting in 1876, sustained campaigns by the Frontier Battalion (Texas Rangers) ... gradually brought order to the region.

They robbed stagecoaches repeatedly. They routinely drove stolen livestock across the Edwards Plateau to Mexican border markets, and returned with other livestock and goods to trade with northbound trail bosses.

They traded regularly in Mexican border markets alongside Mexican Indian raiders, and they might have participated with Mexican Indians in the brutal massacre of four young people of the Dowdy family in Kerr County in 1878.

Starting in 1876, sustained campaigns by the Frontier Battalion (Texas Rangers), aiding fearful settlers and beleaguered county lawmen, gradually brought order to the region.

The Rangers' first campaign, the "Kimble County Cleanup" (April 1877), was an organized surprise sweep of the upper Llano River valleys by about 35 Rangers, who arrested more than 40 suspects and allowed the first district court to be held in Junction City. Outlaws who were county officials resigned.

The first grand jury indicted 25 suspects, but there were not enough honest citizens left over to form a 12-man jury, so the trials were continued until the next district court term. Many outlaws took the hint and left the area, but the criminal confederation organized around the Boyce, Dublin and Potter families stayed.

So did the Rangers – they maintained a permanent camp near Junction City for four more years.

Dick Dublin, leader of the confederation, was killed by Ranger Cpl. Jim Gillett in early 1878. The next summer, Ranger squads arrested six gang members suspected of repeatedly robbing stage coaches carrying military payrolls for Forts McKavett and Concho and jailed them in Austin, to be tried in federal court. One (Rube Boyce) made a spectacular escape from the Austin jail; the rest were convicted in August 1880, and sent to federal prison in Illinois.

In September 1880, outlaws of the Potter family stole a horse herd in Kimble County and headed west across the plateau, pursued by Cpl. Rush Kimbell and six other Rangers. Kimbell's rangers caught up with two of the outlaws at Pope's Crossing of the Pecos River, where they killed one and captured the other.

This marked the end of the Kimble County criminal confederation.

The Big Country (Still)

But late-19th century technology would end the influence of the Edwards Plateau on frontier settlement history. In 1882 railroads were completed that skirted the plateau on the north and south. This put an end to the cattle drives and regional stagecoach-lines.

The plateau uplands began to be settled in the mid-1880s, when the widespread use of cable-tool drilling and windmills began to provide reliable water sources for livestock and permanent habitations, and barbed wire allowed ranchers to control grazing.

The frontier era was over in the region of the western Hill Country of Texas and Edwards Plateau.

But geology continues its influence today: the Edwards Plateau remains sparsely populated.

Migrants from Mexico still cross its semi-arid expanses furtively, and the only changes since 1880 are windmills, barbed wire fences, a few paved highways, widely scattered small towns, well-heads producing oil and gas from the prolific Permian Basin underneath the plateau and the caliche roads that service them.

Editor's note: Rose, is a past president of AAPG.

SPOTLIGHTON

Intern program powers consortia

Caribbean Targeted for Study of Potential

By LOUISE S. DURHAM, EXPLORER Correspondent

An exciting academia-based research effort targeting the Caribbean region that kicked off in September 2005 is now in the stretch drive of a planned triple-phase program.

Known as the Caribbean Basins Tectonics Hydrocarbon (CBTH) project, it originated via a couple of forward-looking geoscientists who at the time were ensconced at the University of Texas at Austin. Its operations base recently was moved to the University of Houston, ultimately becoming a joint program between that institution and the University of Stavanger in Norway.

MANN

> "We have a geographic area, and we work with students generally from those countries."

Although not a factor in the program sharing, Houston and Stavanger are Sister Cities.

The goal of the CBTH project is to create a GIS-based digital and atlas synthesis of available seismic and well data to define the regional hydrocarbon potential of the unexplored Caribbean region.

Certain specific objectives include:

- Identifying source and location of main sedimentary depocenters.
- Continuity of tectonosequences and terranes.
- Producing the first offshore geologic synthesis of the Caribbean region.

The program was the brainchild of AAPG member and former UT faculty member Paul Mann, principal investigator of the CBTH and geology professor at UH, and AAPG member Alejandro Escalona, former doctorate student at UT and current associate professor of geology at the University of Stavanger.

Their passion for the project was obvious early on when they pounded the pavement in Houston on many occasions in their successful quest for corporate sponsors.

"Right now we have 15 sponsor companies," Mann said. "It's a mix of the big super majors and smaller companies, but what they all have in common is they're very active in the region we're looking at."

The main areas of research include:

- Mexican Gulf of Mexico.
- Bahamas.
- Nicaraguan Rise (all sectors).
- Colombia.
- Venezuela.
- Trinidad.
- Guyana.
- Northern Brazil.

The ongoing Phase III of the effort includes the Mexican sector of the GOM, the Caribbean and northern South America. The southern part of the expanded Phase III study area includes the equatorial basins of northern Brazil and a large area of the northern Andean foreland basins.

Win-Win Situation

Mann noted that the CBTH project was modeled closely after the industry-funded GBDS (Gulf Basin Depositional Synthesis) at UT in Austin in that both are geographically focused consortia.

"A number of consortia focus more on a process like, say, carbonate reservoirs," he noted. "We have a geographic area, and we work with students generally from those countries."

The CBTH project currently has 15 employees in Houston and 10 in Norway.

"Most are students, and we help them find data sets for various companies, including many of the sponsors," Mann said. "Those students work on the data as part of either master's or Ph.D. theses.

"We have a targeted intern program where a student goes to one of the sponsoring companies and the company allows that student to work on his-her project as part of the summer internship," Mann said. "This means the student makes progress over the summer.

"A traditional internship is a randomly assigned task that has nothing to do with the student's thesis," he noted. "Companies tend to like the targeted program because in most cases it's an area of interest for

See CBTH, page 38

AAPG Member Named GEO-DC Director

By LOUISE S. DURHAM, EXPLORER Correspondent

Consulting geologist and AAPG member Edith C. "Edie" Allison has been named director of the AAPG Geoscience and Energy Office in Washington, D.C. (GEO-DC), a position that has been vacant since David Curtiss became AAPG executive director in August 2011.

The GEO-DC office, established in 2005, is the focus for AAPG's government affairs program, working actively with AAPG members, sister societies, Congress, and federal and international agencies to bring good science into the decision-making process of public policy. The office is located at the headquarters of the American Geosciences Institute in Alexandria, Va.


ALLISON

As GEO-DC director, Allison will:

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

One of Allison's first activities was to join AAPG members in Geosciences Congressional Visits Day on Sept. 11-12, where scientists, engineers, researchers, teachers and executives visit Washington, D.C., and talk to Congress about the importance of science, engineering and technology.

"We are excited that Edie has agreed to lead GEO-DC into the future," said GEO-DC Governance Board chair Peter MacKenzie, who also chaired the search committee to fill the position. "Her experience in industry and the federal government, combined with her long-standing dedication to AAPG, will serve her ably in this new role."

An AAPG member since 1982, Allison has been active in AAPG affairs, including serving as a member of the House of Delegates, co-chair of the Professional Women in Earth Sciences Committee and was co-chair of the 2011 Eastern Section annual meeting.

She received the AAPG Distinguished Service Award in 2011.

She received a bachelor's degree in geology from West Texas State University and a master's from the University of Utah. She was exploration geologist for Argonaut Energy in Amarillo, Texas, and later joined Mesa Petroleum in Amarillo, Texas.

Allison was a consultant in Amarillo before becoming project manger for the U.S. Department of Energy in Bartlesville, Okla., and in 1996 became program manager for DOE in Washington, where among her duties she developed and communicated budgets and program objectives of the oil and natural gas program to the executive and legislative branches of the federal government.

As a consultant since 2010 in the Washington, D.C., area, she assisted the Secretary of Energy's Advisory Board, Subcommittee on Natural Gas in developing its report on improving the safety and performance of hydraulic fracturing.

CBTH

from page 36

them, so they're making progress in Venezuela, Colombia, wherever they're interested.

"It helps the students because they graduate faster and are mentored by company people on their thesis project and often come up with a permanent job offer," Mann added.

He said the program also sponsors student exchanges between Houston and Stavanger.

"We've been at this for more than six years, and our database is becoming one of the selling points of the project," Mann said. "Companies can become a member and get all of the products into their system and get up to speed quickly."

Something's Coming

Along with the database, the program has yielded a sizeable inventory of theses and other publications, becoming a virtual fount of academic output.

Yet Mann emphasizes that their biggest products are their students.

"Some have gone on to be very prominent in the industry, after only six years on the project," he remarked. "Some go back to their country, but most are here in Houston."

There's something major coming down the pike.

"We have a student working on the giant oil fields of the world," Mann said. "There are 27 clusters of giant fields worldwide, and we're in the process of assembling databases on each cluster, showing how the fields got to where they are, the elements that went into making a giant field.

"It's good for people to know where these big future areas are, and it's easy for us to generate maps, plots and such."

As for the CBTH, after completing Phase III they intend to keep going.

The Geophysical Corner is a regular column in the EXPLORER, edited by Satinder Chopra, chief geophysicist for Arcis Seismic Solutions, Calgary, Canada, and a past AAPG-SEG Joint Distinguished Lecturer. This month's column deals with "elastic impedance" as a fluid indicator.

An 'Elastic Impedance' Approach

By SATINDER CHOPRA and RITESH KUMAR SHARMA

A detailed investigation of seismic amplitudes can yield information pertaining to lithological variation in subsurface sedimentary rock formations and the existence and extent of some hydrocarbon zones.

This objective can be facilitated in a process called seismic inversion, which transforms seismic amplitudes into acoustic impedance values.


CHOPRA


SHARMA

In doing so, the seismic reflection response gets transformed into layered impedance response, which makes the interpretation of the lithological and fluid information more convenient – each transformed impedance trace can now be considered as an impedance log curve and the seismic volume as logs recorded in wells drilled at every seismic trace location.

Just as the changes in the character of impedance log curves are indicative of changes in lithology, porosity and fluid content, similar changes seen on inverted impedance traces are interpretable of these properties in a lateral sense over an area and so over a volume.

Acoustic impedance inversion has now become an integral part of most interpretation projects today.

While this is a beneficial tool for the seismic interpreter, acoustic impedance inversion is usually run on stacked seismic traces – that is, the individual prestack time migrated offset gathers are stacked and then transformed into impedance. To better exploit the fluid effects that manifest on prestack gathers as variation of amplitudes with offset or angle, prestack impedance inversion also can be carried out.

Of course, it would take longer – and so the trade-off is usually between the cost, time and the method to be used.

* * *

A simple way to examine the variations of amplitude as a function of offset is to generate the offset-limited seismic volumes, such as the near-, mid- and far-offset (or angle) volumes. Variations seen on these volumes in desired zones could then be indicative of the fluid information.

For example, a low-impedance gas-sand sandwiched between shale would yield an increase of amplitude with offset. Such a variation can be detected on comparing the near-offset seismic volume with the equivalent far-offset volume, and noticing high amplitude anomalies on the latter corresponding to the gas samples.

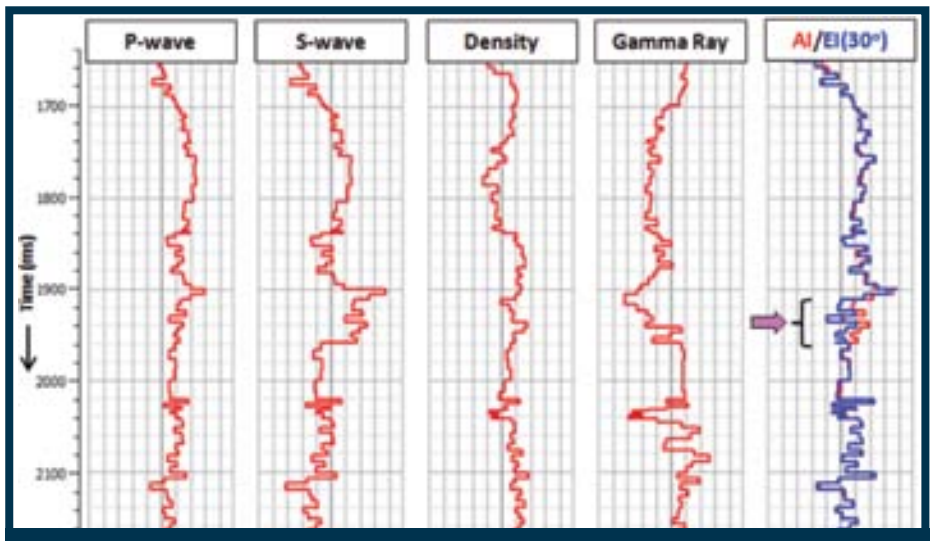


Figure 1 – Display of P-wave, S-wave, Density and Gamma-Ray log curves from a well in the Magdelena Valley, Colombia. The low values for all the curve displays are to the left and high values to the right. To the far right is shown a comparison of an AI curve with the computed EI(30o) curve. Notice the decrease in impedance (deviation in the blue and red curves) at the gas-producing zone as indicated with the purple arrow. (Data courtesy: PetroNorte, Colombia)

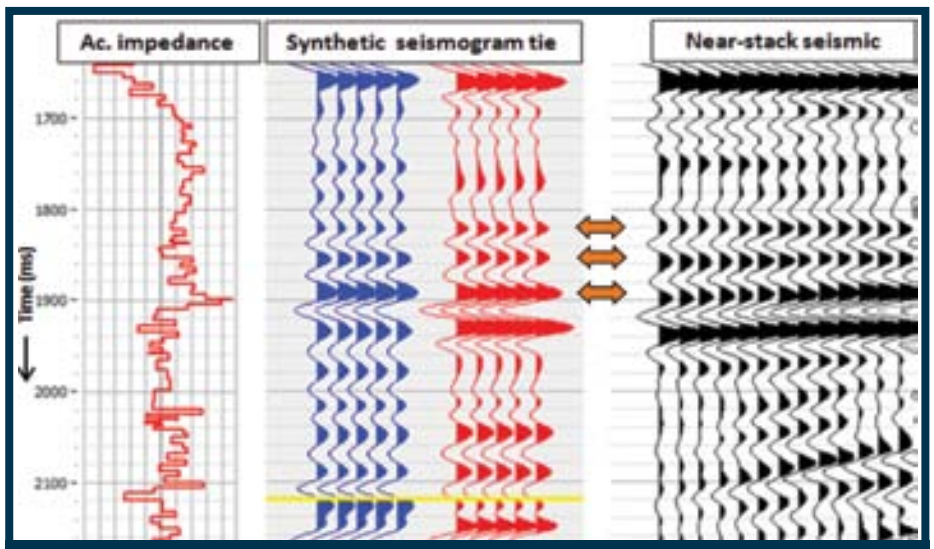


Figure 2 – Synthetic seismogram tie for the low-angle (~10o) near-stack. The synthetic seismogram was generated by using the impedance log curve. The correlation seems to be reasonably good. (Data courtesy: PetroNorte, Colombia)

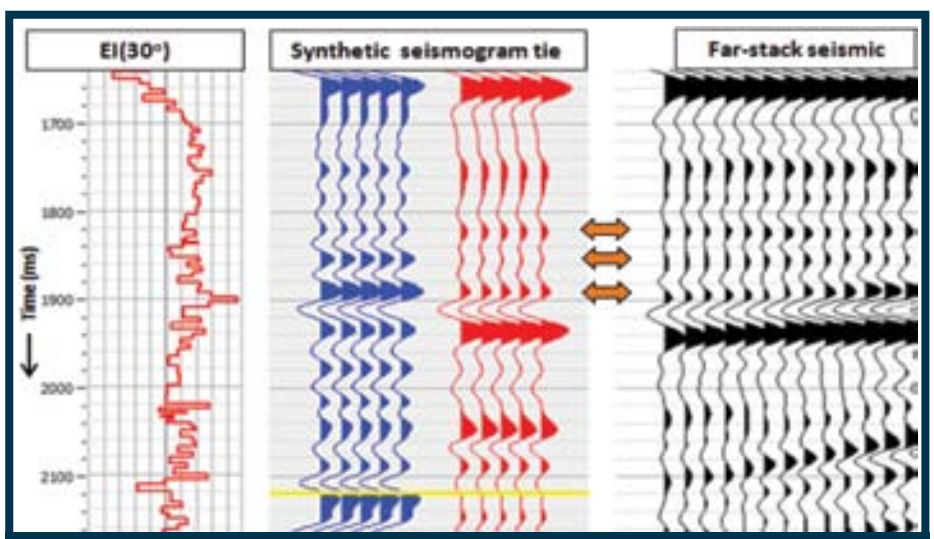


Figure 3 – Synthetic seismogram tie for the high-angle (~30o) far-stack. The synthetic seismogram was generated by using the computed EI(30o) log curve. The correlation seems to be reasonably good. Notice the weakening of the amplitudes at the location of the orange arrows. (Data courtesy: PetroNorte, Colombia)

As amplitudes of the near-offset traces are related to the changes in acoustic impedance they can be calibrated with well log curves or synthetic seismograms. However, if a far-offset or a far-angle stack has to be calibrated with the log data or synthetic seismograms, there is no analogous set of log curves that could be used for the purpose.

Back in 1999, Patrick Connolly from BP pointed this out and suggested the generalization of acoustic impedance for variable incidence angle using a linearized version of Zoeppritz equations. He called this "elastic impedance," and it provides the framework to calibrate and invert non-zero offset data.

The elastic impedance approach is strongly dependent on the medium parameters (V_P, V_S, and density and angle of incidence), and so is often regarded as the rock attribute analog of acoustic impedance for varying angles of incidence.

In actual practice, the CMP gather at the position of the well is picked up, different angle ranges are selected and angle stacks generated. Given the V_P, V_S and density log curves, the elastic impedance is calculated for different angles of incidence. The angle stack traces from the gather and those derived from the log curves (elastic impedance, or "EI") are compared for a visual assessment and interpretation.

* * *

Another useful and meaningful display is the comparison of the acoustic impedance log curve with the elastic impedance curve at the far-angle that is admissible for the given data.

In figure 1, the acoustic impedance log is compared with the EI (30 degree) log curve for a discovery well from Colombia. The target is related to Eocene fluvial deposits, mainly composed of interbedded medium to fine grained quartz sandstones and clay stones.

The gas was detected during mud logging and on the electric log curve; however, the density and neutron curve crossover is not as high as expected, probably due to low saturation as well as its position. The saturation is expected to increase in the up-dip direction.

Notice that there is a decrease of impedance at the gas-sand interface, and so it will show up as higher amplitudes on the seismic data.

It may be mentioned that the elastic impedance values vary significantly with the incidence angle – and because of this, when elastic impedance logs have to be displayed alongside with or overlaid on acoustic impedance, they have to be scaled in such a way that the EI values for

Continued on next page

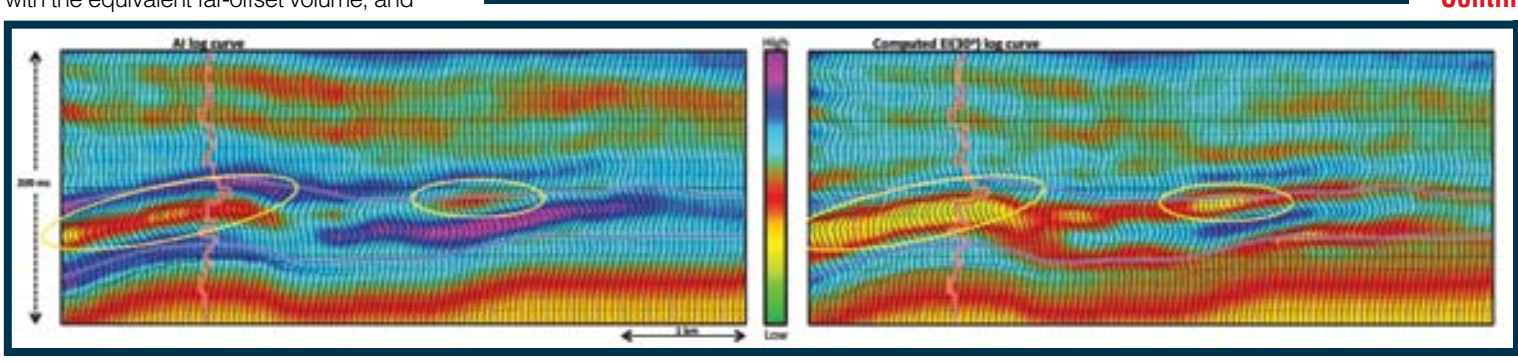


Figure 4 – (Left) Segment of the acoustic impedance section (with the overlaid AI log) shows anomalously low values of impedance at the gas-producing zone (in yellow highlighted zone). (Right) Equivalent segment from EI(30o) section showing the anomaly as much more pronounced. (Data courtesy: PetroNorte, Colombia)

WWW UPDATE

TOTY Online Nominations Process Streamlined

By JANET BRISTER, AAPG Website Editor

Another one bites the dust – another paper trail, anyway.

We're talking about how the AAPG Foundation receives nominations for its Excellence in the Teaching of Natural Resources in the Earth Sciences awards (more commonly called the "Teacher of the Year" award, or TOTY).

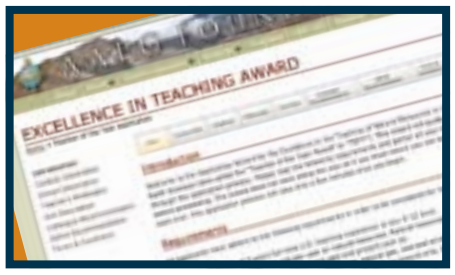
Award nominations are solicited from local societies, which provide material and information about a teacher in his or her geographic area deemed appropriate for this honor.

Until now this was one long paper trail of attachments, faxes and other traditional conveyances.

But now the Foundation website has launched an Application Wizard to facilitate the receiving of nominations. According to Natalie Adams, AAPG Foundation manager, "Providing an easy process with stress-free, anytime access is our goal.

"Applying for funding can be a lengthy process," she said. "We want to make it as simple as possible."

Jane Terry, Foundation program coordinator, observed how "the Foundation would like to increase the applicant pool,



and an online link is easier to market and promote."

She also noted this online application will be faster in providing access to information for the national judges.

It also builds a consistency in the applicant data they didn't have before – and this consistency should help the judges in their evaluation of the candidates.

Why a "wizard," you ask?

Well, it isn't fantasy. In the software world a wizard is a type of user interface that leads a person through a series of dialog boxes, leading them to the completion of a task.

Do Your Homework

If you are the one completing the nomination, you need to gather your information and materials before you visit the TOTY wizard.

All of this is spelled out on the wizard landing page at foundation.aapg.org/toty/app/intro.aspx, and includes four critical documents:

- A document highlighting the nominee's teaching philosophy and methods.
- A description of the unit taught.
- Two letters of recommendation – one from a colleague and one from an administrator.

Once these materials are gathered you are ready to continue through the seven steps.

This wizard does not save your information along the way, but if you gather your materials before beginning you should find yourself completing the process in about 10 minutes.

Good browsing!

Continued from previous page

all angles fall in the range of the normal acoustic impedance values.

In figure 1, such a scaling has been applied to EI (30 degrees).

As stated, elastic impedance also provides a convenient way of producing synthetic seismograms for variable angles of incidence. The computed EI (30 degree) log curve can be used for producing synthetic seismograms, which could now be used for correlation with far-offset/angle stack.

In figure 2 we show the correlation of a synthetic seismogram (generated with the acoustic impedance log curve) with the near-stack from the Magdelena Valley, Colombia. The tie seems to be reasonably good. Figure 3 shows a similar synthetic seismogram (generated by using the EI log curve) tie with the far-offset stack. This tie again seems to be good – but, as expected, the amplitudes at the indicated locations on the far-stack are weaker and seem to tie accordingly with the synthetic.

In figure 4 we show a comparison of a segment of an acoustic impedance section derived from post-stack AI inversion and the equivalent EI (30 degree) section. Notice the differences in the yellow highlighted zones that enclose the gas-producing reservoir. While the hydrocarbon-bearing zone is indicated on the AI section, it appears more pronounced and convincing – and its correlation with the overlaid impedance curve also is much better than the correlation with the AI section.

Thus elastic impedance attribute serves to combine the benefits of working with inverted data with far-angle data where the fluid information resides.

* * *

We thank PetroNorte, Colombia, for giving us permission for presentation of the results shown in this study. We also thank Arcis Seismic Solutions for permission to present this work.

(Editor's note: Sharma, like Chopra, is with Arcis Seismic Solutions, Calgary, Canada.)

"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

Jeff Aldrich, to portfolio manager, Dart Energy, Singapore. Previously head of exploration, Dart Energy, Singapore.

Doug Jordan, to senior geological adviser-stratigraphy, Devon Energy, Oklahoma City. Previously director of new ventures, Chesapeake Energy, Oklahoma City.

Ghazi Kraishan, to petroleum engineering specialist, Saudi Aramco, Dhahran, Saudi Arabia. Previously senior petrophysical consultant, Schlumberger, Doha, Qatar.

Christopher Liner has been named Maurice F. Storm Endowed Chair in Petroleum Geology at University of Arkansas. Liner is a professor of geosciences, University of Arkansas, Fayetteville, Ark.

Hal Miller, to president, Subsurface Consultants & Associates, Houston. Previously senior vice president of operations, Subsurface Consultants & Associates, Houston.

Kent E. Newsham, to chief of staff-geosciences, and distinguished adviser-petrophysics, Apache Corp., Houston. Previously global director of petrophysics, Apache Corp., Houston.

Thomas F. Norton, to contract operations/executions geologist, Chevron, Bakersfield, Calif. Previously contract operations geologist, Venoco, Carpinteria, Calif.

Spencer Quam, to chief geoscientist, Galp Energia, Lisbon, Portugal. Previously head of exploration operations, Qatar Petroleum, Doha, Qatar.

Doug Schultz, to senior geological adviser, Devon Energy, Oklahoma City. Previously senior geologist, Chesapeake Energy, Oklahoma City.

Daniel J. Tearpock, to chairman emeritus, Subsurface Consultants & Associates, Houston. Previously chairman and CEO, Subsurface Consultants & Associates, Houston.

IN MEMORY

Sanford Glen Andrew, 79
Casper, Wyo., Aug. 16, 2012
S.T. Ayers, 86
Oklahoma City, June 25, 2012
Harry Duncan Campbell, 97
Englewood, Colo., May 6, 2011
Thomas G. Carmody, 80
Shreveport, La., July 17, 2012
Charles Edwin Doran, 80
Benton, La., May 11, 2010
James David Elliott Jr., 80
Houston, April 9, 2011
Paul Walker Fairchild, 88
Lakeway, Texas, May 26, 2012
Oswald Cornell Farquhar, 90
Amherst, Mass., May 31, 2012
Dick Spease Horton, 89
Edmond, Okla., March 7, 2011
Richard Hulstrand (Member 1956)
Denton, Texas, June 20, 2012
Amos Calvin Johnson, 57
Jennings, Okla., June 26, 2012
Paul Clyde Kohlman, 87
Longmont, Colo., Jan. 14, 2012
James Edwin Lewis, 90
Tyler, Texas, July 19, 2011
Jack Albert Pounder, 85
Bayfield, Canada, Sept. 23, 2011
Elliott A. Riggs, 83
Farmington, N.M., Aug. 12, 2012
William Henry Sampsel Jr., 87
Billings, Mont., July 19, 2012
William Dibell Shea, 84
Fort Collins, Colo., March 3, 2012
Foster D. Smith Jr., 91
Miami, Fla., May 9, 2012
Rene Joseph Ulmschneider, 60
Midland, Texas, July 20, 2012
Bennie H. Walthall, 85
Texarkana, Ark., Jan. 10, 2011

(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.)

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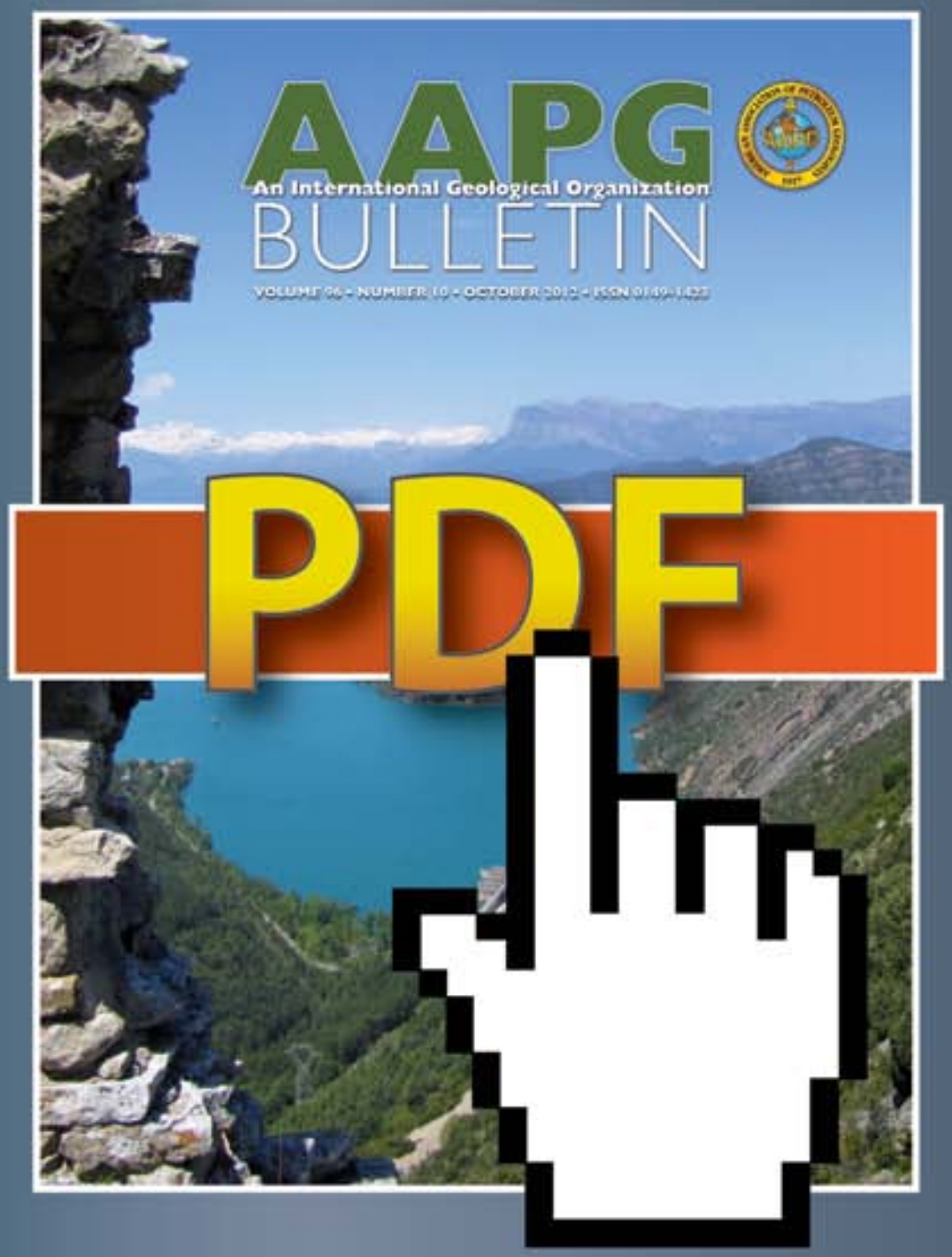

The AAPG Bulletin is a technical journal that is recognized in the industry as the leading peer-reviewed publication for information on geoscience and the associated technology of the energy industry.

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.

Members may access the AAPG Bulletin online at:
www.aapg.org/october_bulletin

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

Article highlights include:

A proposed karstification model

Jhosnella Sayago, Matteo Di Lucia, Maria Mutti, Axum Cotti, Andrea Sitta, Kjetil Broberg, Artur Przybylo, Raffaele Buonaguro, and Olesya Zimina

The identification of subsurface paleokarst signatures is an important challenge in carbonate-reservoir exploration. An integrated approach was used to map paleokarst in the Loppa High, Barents Sea. Thick and widespread breccia deposits resulted from coalesced paleocave collapse.

An unusually low permeability system

Philipp P. Kuhn, Rolando di Primio, Ronald Hill, James R. Lowrence, and Brian Horsfield

A three-dimensional model of the Williston Basin was constructed to assess the parameters influencing the generation and migration of hydrocarbons in the Bakken Formation. This study tests the applicability of basin and petroleum system modeling on an unusually low permeability petroleum system.

Basin-scale clinothems characterized

Mariana I. Olariu, Cristian R. Conejo, Cornel Olariu, and Ronald J. Steel

This study has detailed the dimensions, orientations, and rates of cross-shelf movement of the Fox Hills deltas, Washakie Basin, Wyoming, as they built the topset portion of the Fox Hills-Lewis shelf-margin prism. Coeval delta lobes within each clinothem suggest multiple rivers.

Three-dimensional burrow reconstruction

Małgorzata Bednarz and Duncan McIlroy

The quartzose strips of sediment caused by bioturbation of Phycosiphon-like burrows are highly tortuous and interconnected vertically and horizontally, increasing both horizontal and vertical permeability. Up to 26% of the bioturbated interval can become more porous and permeable.

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

REGIONS and SECTIONS

Middle East Region Sets GTW Lineup

BY ABEER AL ZUBAIDI

In an effort to continue serving the geosciences community in the Middle East, AAPG Middle East Region will be offering a number of Geosciences Technology Workshops (GTWs) where the attendees, practitioners and scientists will have an opportunity to discuss real cases, issues and experiences.

The AAPG Geosciences Technology Workshops, offering the latest in cutting-edge technology in an interactive environment, follow two tracks for discussion: research and application.

The GTW Middle East schedule for the next several months includes:

- "Hydrocarbon Trapping Mechanisms in the Middle East," Dec. 10-12, Istanbul, Turkey.
- "Fracture Monitoring Using Passive Seismic," Jan. 28-30, Dubai, UAE.
- Rock Physics, Feb. 4-6, Kuwait City, Kuwait.
- Geosteering and Well Placement in Thin Reservoirs, Feb. 25-27, Sharm El Sheikh, Egypt.
- E&P Data Management, March 11-13, Dubai, UAE.
- Seismic Reservoir Characterization, March 25-27, Abu Dhabi, UAE.
- Geosciences Workforce: Attraction and Retention, April 8-10, Sharm El Sheikh, Egypt.
- Exploring and Producing Fractured Reservoirs, April 22-24, Dead Sea, Jordan.
- Exploration of Subsalt Structures in Rift Basins, May 6-8, Amman, Jordan.
- Looking Ahead of the Drilling Bit, June 3-5, Beirut, Lebanon.
- Young Professionals Workshop: Mentoring to Bridge the Gap, June 17-19, TBD.

Detailed information is available online, at middleeast.aapg.org.

Ivany DL Tour Set in October

Syracuse University professor Linda C. Ivany, this year's AAPG Roy M. Huffington Distinguished Lecturer, will begin her European speaking tour in early October.

Ivany's research work is at the intersection of marine paleoeconolgy and paleoclimate. Her itinerary will include stops throughout Europe from Oct. 3-14, and she will offer three talks:

- Equator To Pole Temperature Gradients in the Eocene – Insights From Multiproxy Studies of Marine Shelf Macrofossils.
- Early Permian Climate and Seawater δ18O From Microsampling of Fossil Bivalves.
- Reconstructing Paleoseasonality From Accretionary Biogenic Carbonates – Challenges and Opportunities.

The Huffington Distinguished Lecturer is provided by contributions from the Huffington family to honor the memory of the late oilman-geologist.

North America DL speaking tours in October, all funded by the AAPG Foundation, include:

- Ronald C. Blakey will tour western North America sites from Oct. 8-19.
- Kathleen M. Marsaglia will visit western North America sites Oct. 22-26.
- Jeffrey May will visit eastern North America sites Oct. 8-19.
- Chris Paola will conclude a tour of eastern North America on Oct. 5.
- Richard K. Stoneburner will visit eastern North America Oct. 22-Nov. 2.

FOUNDATIONUPDATE

Foundation Contributions Continue to Show Growth

By NATALIE ADAMS, AAPG Foundation Manager

Contributions to the AAPG Foundation are up 58 percent over this time last year, with support this year through Aug. 31 now topping $1,376,813.

Bequests made up a significant portion of gifts, and many donors are faithful to provide regular support to the Foundation's ongoing programs.

For many, donations also accompany payment of their AAPG dues, and the Foundation Trustees gratefully report that so far this year over $76,000 has been received in this manner.

And thanks to many dedicated contributors, the Foundation's operating fund now covers the entire cost of operating the AAPG Foundation. This means that *100 percent of gifts* go directly toward the purpose designated without the need to set aside a portion to cover administrative or overhead costs.

Thank you for your response to our various requests for Foundation support!

* * *

Memorial Grants are used to fund the Foundation's Grants-in-Aid program, which fosters research in the geosciences. Grants are made to provide financial assistance to graduate students (currently enrolled in master's or doctorate programs) whose thesis research has application to the search for and development of petroleum and energy-mineral resources and/or to related environmental geology issues.

Although awards are announced in the spring (with recipients listed on the Foundation's website), contributions are received year-round.

One fund that received a significant contribution this month was the James E. Hooks Memorial Grant.

Jim was an energy industry leader of his time and had a lifelong commitment to education. He sought and applied new technology, but never lost his strong belief that oil and gas are found in the minds of people.

In a fitting tribute from his friends and family, a named scholarship lives on within the Grants-in-Aid program designated for students at his two alma maters of Florida State University and Texas A&M University.

* * *

The Trustee Associates welcome three new members to its roster. They are:

- Marty Hewitt, Houston.
- Priscilla Grew, Lincoln, Neb.
- James Henderson, Dallas.

Members of AAPG who are invited by three Trustee Associates are eligible to join by virtue of their $15,000 contribution to the AAPG Foundation. This contribution may be given over a five-year period and is tax-deductible to U.S. taxpayers, since the Foundation is a qualified 501(c)(3) public foundation under IRS tax code.

* * *

Finally, Trustee Associates Stewart Welch, Jimmie Herrington, Mark Wilson, Sid Bonner and Michael Shearn all passed away in the last few months. We are sorry to lose them, and we honor their memory on a special website at foundation.aapg.org/TrusteeAssociates/obits/index.cfm.

Foundation (General)

Carlos Jorge De Abreu
Donald Irvin Andrews
William Augustus Atlee
Jennifer Marie Ayers
Earnest Jack Barnes
Raymond F. Barrett
BHP Billiton Matching Giving Program
Matching gift given by Richard Nagai

Continued on next page

Continued from previous page

David C. Blanchard
Alexander G. Bray
Donald Lee Brehm
John R. Carmony
Rolin Chen
Chevron Humankind
Matching gifts given by Richard Bell, Donald Medwedeff, David Salter, Stanley Roe, Jim Miller, John Buza and Mark Koelmel
Mary Chibuzo Chikwem
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Harold William Knudsen
Jan Knytl
Steven H. Lingrey
George Leonard Long
Roger Melvin Matson
In memory of Charles Ryniker and in honor of John Andrichuk
Van Dale McMahan
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Karen Amy Sheffield
Eleanour Snow
Ryan Christopher Sonntag
Philip Herald Stark
Lawrence W. Staub
Robert Kenneth Steer
In memory of Thomas D. Barrow
Joe Earl Vaughan
Robert Edward Webster
Ralph Owen Wilson II
William V. York

Awards Fund

John W. Shelton Search and Discovery Award
Richard Dale Fritz

Robert R. Berg Outstanding Research Award
Josephine F. Berg
John O. Hastings Jr.

Ziad Beydoun Memorial Award
David C. Blanchard

Bridge Fund (Switch)

C. Scott Cameron

Digital Products Fund

Indiana University, Bloomington
Jennifer Marie Ayers
University of Calgary
Matteo Niccoli

University of Central Venezuela
Ramon A. Gonzalez-Mieres
Thierry Michel Kabbabe

Wichita State University
Harley K. Sayles

Distinguished Lecture Fund

Keith Arthur Kvenvolden
In honor of John W. Harbaugh
Frederick Nelson Murray
Alan W. Tipka
In memory of William Tipka

J. Ben Carsey Distinguished Lecture Fund
Dorothy Carsey Sumner

Education Fund

James Richard Baroffio
Barth Wetmore Bracken
Chih Shan Chen
Chevron Humankind
Matching gifts given by David Salter
Richard D. Chimblo
Howard Ross Cramer
Paul H. Dudley Jr.
In memory of Elliott A. Riggs
Thomas A. Fitzgerald
In memory of James Harrison Davis
Donald C. Hansen
In memory of John Black
William Herbert Hunt
Bookout Scholarships
Edward Carl Roy III
Paul and Deana Strunk
Geology Fellowship

Grants-in-Aid Fund

Donald C. Hansen
In memory of John Dyer

Bernold M. "Bruno" Hanson Memorial Environmental Grant
Dorothy Carsey Sumner

Classen Family Named Grant
Willard John Classen Jr.
In memory of W.J. Classen Sr.

Edward B. Picou Jr. Named Grant
David C. Blanchard
Nancy S. Williams and Kevin R. Evans
In honor of Jim Derby

Gustavus E. Archie Memorial Grant
James Joseph Parr

J. Ben Carsey Sr. Memorial Grant
Dorothy Carsey Sumner

James E. Hooks Memorial Grant
Rosann F. Hooks
In honor of L.W. Funkhouser

Jean G. Funkhouser Memorial Grant
Richard Dale Fritz

Robert K. Goldhammer Memorial Grant
Robert M. Forkner

Wallace E. Pratt Memorial Grant
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James A. Hartman Student Chapter Leadership Summit Fund

Rhonda A. Welch


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READERS' FORUM

Neil Armstrong


ARMSTRONG


SCHMITT

Neil Armstrong is a true national and international hero in the classic sense. His intellect, dedication and skills made him absolutely the best choice to be the first American and first human to step foot on the moon in 1969 as commander of Apollo 11. Quiet, thoughtful celebration of his life honors the man and his achievements.

Armstrong conducted himself at the highest levels of professionalism – quick to make good decisions in service to his country, as a test pilot and as an explorer in the best traditions of Lewis and Clark.

He often stated, however, that our successes in these difficult arenas only come from the magnificent efforts of hundreds of thousands of others.

One of my many favorite Armstrong memories from Apollo 11 relates to a spur-of-the-moment decision he made late in his walk on the moon. We all trained to focus on collecting the greatest variety of moon rocks possible in the time available – but having already quickly collected one of the finest sets of lunar samples, Neil thought the partially filled rock box needed something more.

He rapidly filled the box with a large amount of the Moon's soil – and this soil became one of the most important samples ever returned from the moon.

Neil's 30 minutes of sampling decisions at Tranquility Base remain the most productive half-hour in lunar exploration.

Neil was a gifted speaker, historian and professor. He did not give a large number of speeches or interviews, but all had been extensively researched and delivered with remarkable clarity and insight. Neil fascinated audiences with his clear articulation of historical events and the relation of technology, aeronautics and space to human activities in the past and future.

I had the great privilege to have known Neil as both a colleague and friend. My wife, Teresa, and I give our heartfelt condolences to the extended Armstrong family and to his legion of friends, colleagues and others so profoundly influenced by the life of Neil Armstrong.

His historical insights, good nature and extraordinary professionalism will be missed more than my words can convey.

Harrison Schmitt
Albuquerque, N.M.

(Editor's note: AAPG member and former U.S. Senator Harrison Schmitt was one of the first geoscientists to be selected to the NASA space program. He walked on the moon as a member of Apollo 17 – the last manned mission to the moon. AAPG's Harrison Schmitt Award, presented for special achievements, is named in his honor.)

What's In a Name?

I read with wry amusement Betty Miller's letter about the talk of changing the name of the organization ("American," August Readers' Forum). What amazes me is that some people actually believe that a name change will suddenly increase membership.

Having been in the business for about 44 years, and managing a conference for a section of a national organization, I certainly recognize the changing demographics and the difficulty in attracting new members. I would not argue with the statistics that Paul Weimer has presented. Certainly for AAPG to grow (perhaps even to survive) it must attract not only more, younger American members, but also members from the international scene.

The real question is how to do this, and I do not believe a name change will make a difference.

If you are overseas and sick and you are looking for a doctor, what gives you more confidence: A certificate from the International Medical Association or a certificate indicating membership in the American Medical Association? Why is it that foreign doctors proudly show their membership in this American organization?

Continued on next page

DPA
from page 51

president Paul Weimer has been a constant contributor – in fact, Paul and I will co-chair a DT forum at the AAPG International Conference and Exhibition in Cartagena, Colombia, next September.

We look for important discoveries, a good story and a good storyteller who knows the discovery well. Ideas for discovery talks are welcome.

Early metrics suggest we've had about 500-800 attendees per each DT talk – and with 24 talks, the five forums represent about 15,000 seats filled.

Granted, some people sit through every talk, so perhaps we are reaching not quite that many people – but still, this is only the beginning.

The entire legacy of Discovery Thinking is a few clicks away on AAPG's *Search and Discovery* web page, Discovery Thinking special collection, at www.searchanddiscovery.com/specialcollections/discoverythinking.html.

Visit, learn and enjoy!

New Ideas: Update

- DPA plans to engage Young Professionals (YPs) in professional development.
- Rick Fritz is building a reference list of the top 20 plays of the last decade as a member benefit.
- Bob Shoup plans great education programs.
- Our DPA leadership team of Valary Schulz, Paul Pause, Mark Gallagher and Debbie Osborne plan to attend many AAPG meetings this fall and spring. Please join me in thanking them for their leadership and commitment.
- I plan to travel the globe, meeting YPs and advocating DPA. This September we start off heading east and keep going around the world until we are back where we started.

Book Recommendations

- "First Man – The Life of Neil A. Armstrong," 2005, James R. Hansen, Simon and Schuster.
- "Heritage of the Petroleum Geologist," 2003, Shoup, Sacrey, Sternbach and Nagy, DPA.

Copies of "Heritage …" are available online at the AAPG Bookstore. It includes great exploration stories, plus a transcript of Michel T. Halbouty's classic paper "Heritage of the Petroleum Geologist," from his 2002 DPA Heritage Luncheon address.

Continued from previous page

Because it means something with regard to professionalism and quality of service. They feel that being a member will make a difference in their career.

Quite obviously (and I regret to say this), AAPG does not engender such feelings.

Even if we change our name to IAPG, why should a young British student join The Royal Society and the IAPG? If there is no value to being a member of AAPG, why is IAPG better?

I am aware that there have been all types of studies on the subject on how to add value to being a member of AAPG. If the best they can concur is that a name change is necessary, Betty is correct.

Norman C. Rosen
Houston

CLASSIFIEDADS

POSITION AVAILABLE

Stratigraphy Faculty Position
University of Kentucky

The Department of Earth and Environmental Sciences at the University of Kentucky invites applications for the Pioneer Natural Resources Professor in Stratigraphy beginning August, 2013. We are anticipating a hire at the assistant professor level (tenure-track), but exceptional candidates at a more senior level will be considered. We seek candidates with field-oriented and/or numerical-modeling expertise in particular. In addition to maintaining a productive externally funded research program, the new faculty member will teach and mentor at the introductory, major, and graduate levels. The successful individual will have a demonstrated publication record and potential for developing a nationally recognized research program; relevant experience beyond the Ph.D. is desirable. Interested applicants should submit a merged .pdf document to Stratigraphy Search Committee, c/o Dr. Ed Woolery (woolery@uky.edu). The document should include: cover letter, curriculum vitae, brief statements of research and teaching interests, copies of relevant research publications, and contact information for at least three references. We will begin review of applications on December 01, 2012; however, applications will be accepted until the position is filled. The University of Kentucky is an Affirmative Action/Equal Opportunity university that values diversity and is located in an increasingly diverse geographical region. Women, persons with disabilities, and members of other under-represented groups are encouraged to apply. The University also supports family-friendly policies. Additional details of the Department of Earth and Environmental Sciences (faculty, research clusters, and facilities) and the University of Kentucky may be viewed at our web pages: www.as.uky.edu/ees and www.uky.edu.

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Assistant Professor – Sedimentary Processes
Massachusetts Institute of Technology

The Department of Earth, Atmospheric and Planetary Sciences at the Massachusetts Institute of Technology invites applications for a junior faculty position in Sedimentary Processes. We seek an individual with broad interests, a research program that includes field observations, and a commitment to interdisciplinary studies. Applicants should submit a curriculum vitae; one-page descriptions of research and teaching plans; and the names, email addresses, and phone numbers of three professional referees by December 14, 2012. Please do not ask your referees to upload letters at the time of application; letters will be requested directly by MIT. Questions may be addressed to Prof. Leigh Royden, Search Committee Chair, at lhroyden@mit.edu. Applications are being accepted at Academic Jobs Online (https://academicjobsonline.org/ajo). To receive consideration, a complete application must be received. Search Contact: Mr. Michael Richard, HR Administrator, EAPS, 54-912 Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307. Email: mjr@mit.edu. Telephone: 617-253-8298. *MIT is an Equal Opportunity/Affirmative Action employer. Applications from women and underrepresented minority candidates are encouraged. MIT is a nonsmoking environment.*

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Associate/Full Professor Petroleum Geology
Midwestern State University

The Department of Chemistry, Physics, and Geosciences invites applications for the Robert L. Bolin Distinguished Professor of Petroleum Geology (a tenure-track position) to begin Spring 2013. We seek candidates with expertise in petroleum geology, source/reservoir characterization, or exploration geophysics. The successful candidate will teach introductory courses, Petroleum Geology, and other appropriate upper-level courses. Experience in developing a successful undergraduate research program will be given special consideration. Requirements include a Ph.D. in geosciences, strong interpersonal skills, and publications in refereed journals commensurate with experience. MSU is a comprehensive public university serving over 6000 students. The Geosciences Program has strong ties with regional petroleum exploration and environmental science communities and is poised for continued growth in the next five years. Send an application letter, CV, statements of teaching and research interests, and the names and contact information of three references to Dr. R.L. Dodge, Geosciences, Midwestern State University, 3410 Taft Blvd., Wichita Falls, TX 76308; email:rebecca.dodge@mwsu.edu. Review of applications will begin immediately, and this position will remain open until filled. This position is designated as security sensitive and requires the finalist to complete a criminal background check.
EEO/ADAAA compliance employer.

MISCELLANEOUS

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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.

WestVirginiaUniversity.
DEPARTMENT OF GEOLOGY AND GEOGRAPHY

Assistant Professorship
Quantitative Structural Geology or Geomechanics

The Department of Geology and Geography at West Virginia University seeks an Assistant Professor specializing in quantitative structural geology with interest in the study of fractured reservoirs and geomechanics. The successful candidate will have the opportunity to develop a vigorous externally-funded research program which contributes to the area of energy resources and to the WVU Advanced Energy Initiative (energyresearch.wvu.edu). The new hire will also teach courses in geology at the undergraduate and graduate levels to help meet the department's growing enrolment.

Applicants should have a PhD in geology, earth science, or related field by the start date. Evidence of ability to establish a strong externally-funded research program and of commitment to teaching excellence at the undergraduate and graduate levels in geology is 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. Candidates should send a .pdf file with all their application materials as an e-mail attachment to jtoro@wvu.edu. Questions may also be addressed to Dr. Jaime Toro at the same address or via telephone 304-293-9817. The submitted electronic file should include: 1) a letter of application detailing research and teaching interests and how these relate to departmental research activities; 2) resume/curriculum vitae; and 3) names and complete contact information for three references. Review of applications will begin Oct. 15, 2012 and continue until the position is filled. The anticipated start date is August 16, 2013.

Please see **http://www.geo.wvu.edu/files/geomechanics.pdf** for additional information.

West Virginia University is an Equal Opportunity/Affirmative Action employer and the recipient of an NSF ADVANCE award for gender equity. We encourage women and minority candidates to apply.

DIRECTOR'S CORNER

Listen – Here's a Way to Make a Difference

By DAVID K. CURTISS, AAPG Executive Director

I am writing this column high above the U.S. midcontinent, the setting sun throwing long shadows across the aircraft cabin. I am heading east from Grand Junction, Colo., where I had the privilege of attending the Rocky Mountain Section's annual meeting.

It's the first time that the meeting had been held in Grand Junction, which is surprising considering its central location in the Section amongst fabulous geology – not to mention the peach orchards and vineyards.

My congratulations to Jay Scheevel, the meeting's general chair, and the entire organizing committee, as well as President Bob Suydam and the leadership of the Rocky Mountain Section for hosting a great event. It was a success by any measure: standing-room-only technical sessions, buzzing poster sessions and a wide variety of exhibitors.

* * *

The meeting's Monday luncheon featured a special speaker: Gov. John Hickenlooper (D-Colorado).

There have been several trained geologists who have served in the U.S. government – former Secretary of State Colin Powell is a notable example – but Hickenlooper is the only geologist in U.S. history to serve as a state governor.

And he is one of few elected officials who truly understands the oil and gas business from the inside, having worked as a petroleum geologist – and by being a member of AAPG.

One of the points that Hickenlooper made in his remarks is the importance of not just talking about oil and natural gas supply, but also talking about demand.


CURTISS

We don't spend much time talking about *why* what we do matters. We take for granted that the public understands the importance of our science.

As petroleum geoscientists, our principal focus is on finding and producing more oil and natural gas. That's what we do and that's what we talk about when we get together at meetings around the world.

But we don't spend much time talking about *why* what we do matters. We take for granted that the public understands the importance of our science.

The shale gas production boom and accompanying natural gas price bust is a good example. It has created tremendous opportunity for states and municipalities, and Hickenlooper is leading the charge to take advantage of it.

He and Gov. Mary Fallin (R-Oklahoma) have assembled a consortium of 22 states to encourage the large U.S. auto manufacturers to produce compressed natural gas (CNG) vehicles directly on the production line (rather than as a retrofit). North America is the only continent with automotive manufacturing that does not produce CNG vehicles.

Hickenlooper and Fallin have visited the chief product development executives in Detroit at GM, Ford and Chrysler to encourage them to build CNG fleet vehicles – and the response they received was very favorable.

This could jumpstart a much broader adoption of natural gas as a transportation fuel, and would enable states to benefit both from the abundance of natural gas and its current prices.

But there is a risk that the natural resource abundance we see might not materialize. Many of the challenges that the industry faces in its operations, according to Hickenlooper, is because it is failing to shape public sentiment. And he sees a closing window of opportunity to explain to the public the costs and the benefits of petroleum exploration and production.

He fully accepts that it is not an easy task. When asked how you do it, he replied, "by listening." Listening to those who disagree with you is a critical path to building the relationship required to earn the right to influence their attitudes and opinions.

In a cable news world of talking points and blaring pundits, it seems like a soft touch, perhaps even weak. But my experience supports Hickenlooper's approach. Listening and building relationships can be time consuming (and occasionally be frustrating), but it is effective. And relationship-building is at the heart of AAPG's activities in Washington, D.C.

Not coincidentally, that is where my plane is headed right now.

* * *

I'm on my way to Washington – with geoscientists from many different societies – for the fifth annual Geosciences Congressional Visits Days. Together we will be visiting Capitol Hill to discuss policy issues of importance to AAPG members and the broader geoscience community, and in meeting with policymakers and staff provide them with contacts who are both experts and constituents.

I also will have the privilege of welcoming a new GEO-DC director to AAPG. Edie Allison, a stalwart AAPG member, has agreed to lead our efforts to build relationships with policymakers and staff in Washington, D.C. (See related story, page 38.)

Her charge is threefold:

- To bring AAPG science expertise into the policymaking process.
- To report on the policy issues that will directly affect AAPG members.
- To create opportunities for AAPG members to begin building their own relationships with policy-makers and staff.

The dramatic changes in our industry over the past decade have the potential to transform the world for the better. But people need to understand the benefits in order to accept the risks. That is what we're doing through GEO-DC.

Please, consider taking an active role with us by talking to your circle of influence how our science and profession benefits our families, friends and communities.

DIVISIONS REPORT

DPA Plans 'Play Maker' Forum

By CHARLES A. STERNBACH, DPA President

DPA can play an important role in developing the professionalism required to generate prospects, discoveries and exploration workflows.

In keeping with AAPG initiatives to advance professional and scientific content, DPA plans a new "Play Maker" forum for Thursday, Jan. 24, at the Norris Conference Center in Houston, in partnership with the AAPG Education Department.

This inaugural one-day event will feature prospecting and professional skills as discussed by the best in industry. Plans include talks on emerging plays, educational programs and an entrepreneurial/technical/ethical luncheon success story.

All AAPG members can benefit. Complete details will follow in the weeks ahead, but for now we can tell you that we plan to feature talks on emerging plays by those who know them well. We plan to select the very finest talks from top plays. Many will have open acreage and draw multi-disciplinary interest among geologists, entrepreneurs and land men.

Other talks will focus on "professional skills you can use right away." Topics being considered include: Assembling and Presenting Conventional Prospects; Assembling and Presenting Resource Plays; Marketing Your Prospect; Play Economics; Screening Unconventional Plays; Quick Look Techniques to Evaluate Prospect Viability; 10 Habits of Highly Successful Oil Finders; Exploration Creativity; How to Decide to Get Into a Play (Or Not); Geo Scouting Regional Play Analysis; What AAPG Resources Can Do For You; Black Belt Ethics Class; and Do's and Don'ts of Prospect Presentations.


STERNBACH

DPA has an important role to play in professional skill sets that drive economic engines, and programs like Play Makers can help each of us improve our bottom line.

Value Proposition

As professionals prepare for prospect expos at the beginning of 2013 (and globally throughout the year), we think a one-day format will deliver valuable and timely content. Attendees will benefit not just from the talks, but also from networking breaks, luncheon, course notes, continuing education credits and a "wildcatter icebreaker."

Plans also are being made to broadcast webinars to expand the global reach of topical professional information.

Events like Play Maker can be the front line for mentoring Young Professionals. DPA welcomes new streamlined member applications online at dpa.aapg.org/certification.cfm.

Expanding the Conversation

Prospects and discoveries are a continuum. I believe AAPG members are the best prospectors in the world. Geologists are creative individuals and integrators. DPA has an important role to play in professional skill sets that drive economic engines (as mentioned in my July EXPLORER column), and programs like Play Makers can help each of us improve our bottom line.

This also is true for AAPG and DPA. Revenue and sponsorship will enable DPA to fulfill our promise to deliver value to our members, including continued support of the GEO-DC office.

(Incidentally, DPA is pleased and proud to welcome the new GEO-DC director, Edie Allison. See the related story on page 50.)

Discovery Thinking

The Play Maker program on prospecting skills is a natural outgrowth of another AAPG program – Discovery Thinking (DT), where industry greats tell stories of exploration and professional skills.

Looking back, DT was a bold move five years ago, just like Playmakers is today. Ted Beaumont was my co-chair for the 2008 inaugural DT forum. Tom Ewing (DPA president 2008) had the vision for DPA to co-sponsor DT before success was assured. Ed Dolly joined me as co-chair in 2009, and stuck with the program at ACE meetings ever since. Past AAPG

See DPA, page 49