AAPG EXPLORER
JUNE 2012

Castle in the Sky

A majestic trip through the Palo Duro

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Vol. 33, No. 6
June 2012

PRESIDENT'S COLUMN

Annus mirabilis

By PAUL WEIMER

My year as AAPG president started informally and unceremoniously. On 27 May 2011, while I was president-elect, my oldest son and I visited Buenos Aires so that I could teach my first AAPG Short Course at the local university. We found ourselves walking down the Avenida 9 de Julio in Buenos Aires early that Sunday morning. Suddenly, an elderly gentleman stopped to inform us frantically that – as best we understood – the local pigeons had relieved themselves extensively along our heads and the back sides of our clothing. After rapid self-examination, we returned to the hotel, where we quickly changed from our soiled clothes and took extended showers. Later, Gustavo Carstens, one of our hosts, tried to convince us that this event was a sign of good luck in Argentina. At first I was skeptical, but based on the incredible year I just had, perhaps the birds' actions were propitious …

* * *

Accomplishments for this year were on both a personal and professional level. I am indebted to AAPG membership for allowing me the opportunity to meet and to present to so many members. Their hospitality and generosity was simply overwhelming. With so many dedicated, passionate leaders in so many countries, I believe that the future of AAPG is bright. -

In this year's columns I have attempted to keep members informed by directly discussing the major issues that the Executive Committee addressed.

▸ **Budget issues:** We started the year with some gloomy projections, due to a number of factors that Treasurer Jim McGhay and I reviewed in the October and March Explorer columns. Jim and AAPG staff worked hard towards resolving these issues, and we expect to end the year with approximately two-thirds of the deficit that we originally had expected. We also expect more positive budgets moving forward. My kudos to Jim and AAPG staff for this accomplishment.


WEIMER

> "With so many dedicated, passionate leaders in so many countries, I believe that the future of AAPG is bright."

▸ **New revenue source:** The upcoming Unconventional Resources Technology Conference (URTeC) – the inaugural event will be Aug. 12-14, 2013, in Denver at the Colorado Convention Center – holds substantial promise as a major event for industry as well as a source of financial gain for AAPG and our partners.

▸ **New joint cooperation with SEG:** Following the lead of former AAPG President Lee Billingsley and former SEG President Bill Barkhouse, our two societies are discussing many possible future joint efforts. I am encouraged by the possibilities that would benefit members from both societies.

▸ **Membership issues:** Following the lead of Jeff Lund and Andrea Reynolds, last August the EC expedited the application process for members. Subsequently, at the House of Delegates meeting April 22 in Long Beach, they voted to adopt an additional measure for membership simplification. Continuing to simplify the membership application process is crucial to growing our society. I encourage everyone to keep the positive momentum developed at this year's meeting.

▸ **Publication issues:** As we discussed in the April column, I believe that prompt digital delivery of all of AAPG's scientific information is at the heart of our Association's value, and our ability to retain current members and acquire new ones. We have started a long process, and hope that we can continue through fruition for membership.

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AAPG Officer Election Results

Lee Krystinik, principal with Fossil Creek Resources, Arlington, Texas, has been voted president-elect by the AAPG membership for the 2012-13 term and will serve as AAPG president in 2013-14.

Also elected were:

❒ Vice president-Sections – **Thomas E. Ewing**, geoscientist and partner, Yegua Energy Associates, and geoscientist, Frontera Exploration Consultants, San Antonio.

❒ Treasurer – **Deborah K. Sacrey**, owner, Auburn Energy, Houston.

Both the vice president-Sections and treasurer will serve two-year terms.

Of the 15,179 members eligible to vote, 4,778 ballots were cast for a 31.5 percent participation. There were 2,427 web ballots cast and 2,351 paper ballots, according to Survey & Ballot Systems Inc, of Eden Prairie, Minn., who handles the election process for AAPG.

The newly elected officers will begin their duties on July 1, serving on an Executive Committee headed by **Edward A. "Ted" Beaumont**, senior geologist with SM Energy in Tulsa, who assumes the AAPG presidency.

Others on the 2012-13 committee – and serving their final year of their term of service – are AAPG Elected Editor **Stephen Laubach**, Bureau of Economic Geology, Austin, Texas; **Denise M. Cox**, Storm Energy, Panama City, Fla., secretary; and **Stuart D. Harker**, Circle Oil Plc, Finchampstead, England, vice president-Regions.

Also on the new committee will be **Randy Ray**, independent geologist and chief geoscientist, Underground Energy, Denver, who will assume the chair of the House of Delegates.

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REGULAR DEPARTMENTS

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

ON THE COVER:

The spectacular Palo Duro Canyon is a geologic wonderland located near Amarillo, Texas – it is the second largest canyon in the United States, and perhaps its most famous feature is Lighthouse Peak. The canyon also will be the setting for the Mid-Continent Section's inaugural biennial field conference, slated for Oct. 5-7 (but registration for the limited slots opens in June). See story on page 26. Photo courtesy of Flickr.com.

Photo left: Capitol Peak on the trail to the Lighthouse in Palo Duro Canyon. Photo by Paul Smith.

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Divisions Announce Election Results

Election results are in and new officers have been announced for AAPG's three divisions.

In all cases the president-elect terms are for 2012-13, with the officer assuming the division presidency for 2013-14.

The results are:

Division of Environmental Geosciences

❒ President-elect – **Douglas E. Wyatt Jr.**, URS Corp., Aiken, S.C.

❒ Vice president (one-year term) – **Michael S. Hagan**, E Tech Environmental and Safety Solutions, Midland, Texas.

❒ Editor-in-Chief (two-year term) – **Kristin M. Carter**, Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey, Pittsburgh.

The newly elected officers will be joined on the DEG Executive Committee by president **Tom J. Temples**, independent, Clemson, S.C.; secretary-treasurer **M. Jane Ellis-McNaboe**, EnviroTech Consultants, Bakersfield, Calif.; and past president **Douglas C. Peters**, consultant, Golden, Colo.

Division of Professional Affairs

❒ President-elect – **Valary L. Schulz**, Cinco Resources Inc., Dallas.

❒ Vice president (one-year term) – **Paul H. Pause**, consultant, Midland, Texas.

❒ Treasurer (two-year term) – **Debra P. Osborne**, COG Operating, Midland, Texas.

They will be joined on the DPA committee by president **Charles Sternbach**, Star Creek Energy, Houston; secretary **Mark Gallagher**, Encana, Dallas; and past president **Martin D. Hewitt**, Nexen Petroleum USA, Plano, Texas.

Energy Minerals Division

❒ President-elect – **Jeremy Boak**, Colorado School of Mines, Golden, Colo.

❒ Vice president (one-year term) – **Robert A. Trevail**, Dallas Energy, Freedom, Pa.

❒ Secretary (two-year term) – **Bruce Handley**, consultant, Houston.

They join president **Andrea Reynolds**, Shell Exploration, Warrendale, Pa.; treasurer **David Tabet**, Utah Geological Survey, Salt Lake City, Utah; and past president **Stephen M. Testa**, State Mining and Geology Board, Sacramento, Calif.

President
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▸ Student Expos: AAPG currently supports job fairs in five sections: Eastern, Gulf Coast, Mid-Continent, Pacific, and Rocky Mountain. A significant amount of recruiting for U.S. members happens at these Job Fairs. To all the organizers and employers: Many thanks for providing this critical service.

▸ IBA program changes: The IBA program has become a highly successful program, especially in the Regions. Structural changes have been made and will continue next year to ensure its future success and financial well-being.

* * *

Finally, my special thanks to six groups who made this year's accomplishments come to life.

I am much indebted, in particular, to those Executive Committee members with whom I had the privilege to serve for two years: Marv Brittenham, Jim McGhay, and Steve Laubach. We served on the executive director search together, and have worked to resolve many unanticipated issues. Thanks also to the other members of this year's Executive Committee: Ted Beaumont, Denise Cox, Stuart Harker, and Jeff Lund. The Association has a fine group of continuing and incoming officers, and a great slate of officer candidates. The Association, as always, remains in good hands.

I thank all of those who lent me their slides for the speaking tour: Tom Ahlbrandt, David Allard, Renaud Bouroullec, Steve Cumella, Bill Fisher, Ben Herber, Jeff May, Paul Rady, Bobby Ryan, Pete Stark, Scott Tinker, Mark Williams, and Bill Zagorski.

Several people gave me much-needed input for the past year's columns: Richard Ball, Ted Beaumont, Lee Billingsley, Ed Dolly, Bret Fossum, Gretchen Gillis, Stuart Harker, David the Hawkman, Ben Herber, John Hogg, Nick LaGrilliere, Steve Laubach, Mike Leibovitz, Jeff Lund, Jim McGhay, John Underhill, and M.S. Wacker. My wife, Laurie, served as the best editor a president could ever have – moochas smoochas. (She did not ask nor require me to write that last sentence).

A special thanks to Geovani Chang, Vlasta Dvorakova, Carol McGowen, Adrienne Pereira, and Pinar Yilmaz for their special efforts in arranging key aspects of my global travel. For the almost 200 other volunteers who served as sponsors along my trek – hugs, handshakes and/or air kisses.

Thanks to Bruce Benson, Lang Farmer, and the University of Colorado for allowing me to have this special year.

Thanks to all of AAPG staff for their incredible support during the year.

As my last official act as president, I hereby appoint Dr. Stuart Harker, Vice President of Regions, as the Poet Laureate of AAPG for 2012 to 2013. Appropriate laurel wreaths, tartans, sceptres, gewgaws, and go-go boots come with this designation.

Well, I think it's time for my boot heels to be wanderin' ... 100,000 thanks again for the *Annus mirabilis*.

Paul Weimer

Wireless Seismic Expanding in Marketplace

By LOUISE S. DURHAM, EXPLORER Correspondent

Seismic data acquisition systems dubbed cableless, wireless, cable-free, no-cable, etc. were viewed as a kind of novelty in the industry only a few years ago.

That has changed dramatically as the success stories emanating from increased numbers of field applications are being reported evermore often.


SILVERNAGLE

It had to happen, not just offshore but also on land in particular.

Think about seismic crew members traipsing around rugged, inhospitable terrain lugging the heavy, cumbersome cables and accompanying equipment required by cable systems, the longtime industry stalwart.

Then consider the cost and time to load and move all of this weight via helicopter – a transport frequently necessary to reach the often-inaccessible areas where data must be acquired.

There are other issues.

Besides the potential to leave an undesirable environmental footprint using cable systems, gnawing sharp-teeth varmints feast on these wires wherever possible – troubleshooting, anyone?

Even ordinary thunderstorms pose a risk.

"A lot of wire on the ground is a big problem where you have thunderstorm activity because of the static it generates into the cable," said Darin Silvernagle, vice president of technology at SAExploration, or SAE, (nee NES LLC). "When you have 400 miles of wire laid out on the ground, static can be a big problem."


Photos courtesy of Dawson Geophysical

Cable-free node deployed near Pecos in the Permian Basin in west Texas.

The available cableless, i.e. nodal, land systems include the FairfieldNodal ZLand® system and its transition zone, shallow water counterpart Z700, INNOVA HAWK®, Sercel UNITE and OYO GSR, among others.

Nodal systems are designed to meet a number of industry needs:

- More flexible acquisition geometries, e.g. wide and full azimuth for land surveys.
- Reduced downtime and maintenance.
- Increased productivity.
- Improved health, safety and environment conditions (HSE).
- Enhanced access to challenging locales.

Cook-ing Experiments

Today's high-tech nodal systems are being purchased and/or leased by data acquisition companies as well as oil companies.

Selecting the best available product for the job at hand is a far more complex process than perusing a group of display shelves with credit card in hand and zeroing in on which system captures your fancy at the moment.

First there's the field trial, such as the one conducted recently by SAE for Apache Corp. The trial took place over a part of Apache's sizeable lease position at Alaska's Cook Inlet, which the company views as an exploration play.

The 2-D program tested a variety of seismic recording and source systems to determine which would best meet the demands of exploration across the area. Both nodes and traditional cable digital telemetry seismic technology were put through their paces.

The end result: The continuously recording, totally cable-free self-contained systems were selected by Apache for its multi-year 3-D seismic program in the area. This marks the first time that both the onshore and offshore versions of the equipment are being used in combination.

The program is designed to include marine, transition zone and land environments. The water depth at Cook Inlet at high tide doesn't exceed 100 feet, according to Silvernagle.

Actually experiencing the ease of operations and the resulting high quality seismic data using the nodal system in Alaska's unpredictable pack ice and ground conditions can be mighty convincing.

SAE not only purchased the equipment for the trial shoot at Cook Inlet, it also leased 6,000 nodes for a program it operated for 120 days in southern Alberta in Canada this past winter. Afterward, it shipped that equipment to New Zealand, Silvernagle noted, where it will be deployed on a 3-D program until July, when SAE will bring it

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back to North America.

SAE also runs a crew for Brisbane-headquartered Linc Energy, which purchased a ZLand system to deal with upcoming projects that harbor some unique challenges, according to Keith Matthews, systems division sales director at FairfieldNodal.

"In the node world, the weight per channel is down to about five to seven pounds, which is a big advantage for us, compared to about 20 pounds for wireless," Silvernagle said. "There are operational advantages in how quickly you can move the equipment, and you can move it with fewer people. The HSE advantages speak for themselves."

Variety Shows

Ice-covered ground appears to be no deterrent to nodal system application.

Besides the Cook Inlet test, a couple of successful comparison demos were implemented recently under Arctic conditions in two densely forested areas in frigid Siberia.

Matthews pointed out the self-contained battery-equipped nodes, even though buried under two feet of snow, functioned perfectly, generating significant interest among the Russians for a true cableless kit.

A world removed from ice and snow, the company's nodal land system was put through a 3-D seismic acquisition test in a jungle area in Uganda, reportedly in preparation for an upcoming program in an environmentally sensitive game preserve. The ability to bury the individual nodes under topsoil is a considerable advantage.

Regarding the test, Matthews noted the nodes performed as they envisioned.

Comesa (Compania Mexicana de Exploraciones S.A. de C.V.) crew member positions cable-free nodal seismic unit in sugar cane field in Tabasco, Mexico, prior to field burnoff that left all nodes intact and unharmed.

The World Wildlife Fund announced recently that Total E&P is preparing for a nine-month seismic study in Uganda's Murchison Falls national park beginning in September.

Aside from the "real" jungle, the urban jungle is equally challenging for data acquisition.

Entirely cable-free nodes are ideally suited for application in densely populated cities. This was demonstrated with the successful implementation of a 3-D ZLand survey at the old Long Beach oilfield sitting right smack in the middle of suburbia.

The unobtrusive nodes left essentially no footprint, and the vibrator trucks followed a schedule designed for the least impact on the citizens and businesses.

The same type nodal system then was used by NodalSeismic to acquire data in California's Santa Maria Basin. The survey entailed a couple of two-and-a-half-D swaths, or what can be called a wide bin 3-D, of about 20 miles each, according to Dan Hollis, managing partner at NodalSeismic.

Proving a Point

Henri Houllevigue, vice president of geophysics, Total E&P Research and Technology, USA, and experienced in the world of nodal technology, said there are values of degree in cableless, with some systems having cables between phones, sensors or whatever.

"Today, the offerings are diverse, but for me, there's a difference between cableless and nodal," he said. With entirely cable-free nodes, you put them in the ground and then just forget about it until you come back to pick them up.

"For the oil company, there's a full range of systems available, from the complete nodal system to the real time system," he said. "They can choose depending on their needs.

"For the acquisition company, it's more difficult because you must choose one system," he continued. "If you want to purchase a system, you must make a choice and, depending on the oil company's problem, that choice might not completely fulfill what the oil company is requiring."

Compare and contrast is the operative phrase.

"We're hearing from many of the leading seismic acquisition companies who want to see how our systems can improve their performance in terms of productivity, HSE and cost effectiveness," Matthews said.

"We're currently involved in a major spec project in West Texas where Dawson Geophysical is the contractor," he continued. "Our goal is to demonstrate the superior performance of 10,500 of our land nodes when compared to a cable system, or the OYO GSR system."

An Evolutionary Curve

It's not a stretch to say that the industry is in a transitional phase.

"We believe wireless technology is functional anywhere," Silvernagle emphasized. "Each system has its own nuances.

"But there are still a lot of areas where cable has its place and works fine," he stressed. "We do still employ cable systems and own the equipment.

"There are some technical things that need to be worked out with all of the nodal systems that allow us to employ different techniques," he added. "The technology is evolving and will continue to evolve."

Many in the industry likely recall that nodal technology was all about

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Integrated Data Helps Spot High EUR Wells

By DIANE FREEMAN, EXPLORER Correspondent

A Canadian geophysicist is finding success by incorporating existing 3-D data to determine fracture networks in the Bakken – and that could lead to identifying future prospects earlier in the exploration process.

Elaine Honsberger, chief geophysicist at Enerplus in Calgary, Alberta, is talking about her past experience and current activity in the Elm Coulee field, a giant Williston Basin oil discovery producing from the middle Bakken Formation.


HONSBERGER

"All of the mapping work to locate and drill Enerplus wells in Elm Coulee has been done with detailed geologic mapping based on knowledge gained from wells as the field has been developed," Honsberger said. "To date, we have not used seismic to locate or drill any wells in Elm Coulee.

"That said," she continued, "having now had a good long look at 3-D seismic over Elm Coulee, I am optimistic the additional knowledge we gain by integrating our geological, engineering and geophysical interpretations will be helpful to the future development of the Bakken.

"Primarily, I see 3-D seismic as a very useful tool that can be used to better understand the tectonic history of the Bakken," she said, "which I believe is the key driver of the natural fracture network.

"If we can understand the tectonic history of the Bakken, we may be able to differentiate between areas where we expect to drill higher EUR (estimated ultimate recovery) wells versus lower EUR wells," she added.

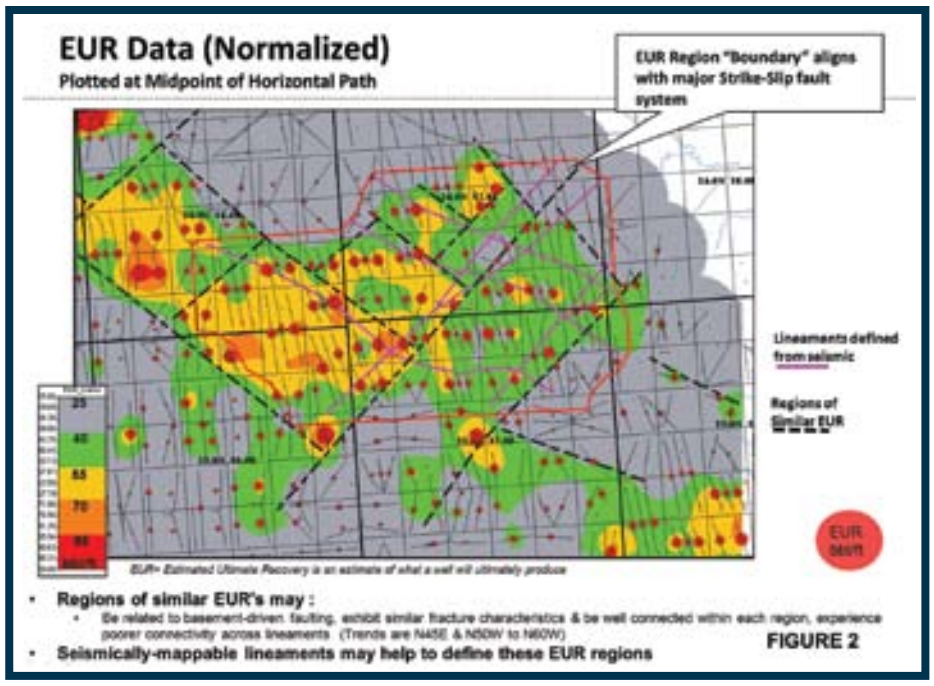

FIGURE 2

"The concept is particularly intriguing for Bakken fields early in their development life cycle."

Honsberger spoke at the annual 3-D Seismic Symposium this spring in Denver. The program, which attracted a record 700 attendees this year, is sponsored by the Rocky Mountain Association of Geologists and the Denver Geophysical Society.

Honsberger, in speaking specifically about the use of seismic in the Bakken play, said "there's a wealth of seismic that has been shot in North Dakota, where the Bakken is undergoing an extreme pace of development.

"I'm a curious person, so I wanted to understand the role seismic could play by using the Elm Coulee Bakken field as an analog," she said. "I wanted to have a look at it and see if 3-D could help determine the fracture networks I believe are in place.

"The bottom line is I wanted to learn about the Bakken and determine if there was enough evidence to support using seismic for the Bakken play in Montana and North Dakota," she said.

Critical Picks

The Elm Coulee field is located along the southwest rim of the Williston Basin in northeast Montana. The field, also known as Sleeping Giant, covers more than 500 square miles and has about 700 horizontal wells producing from the Bakken Formation.

Honsberger, in seeking to determine how 3-D seismic might relate to resource and performance indicators, wanted first to understand the basin's structural framework and tectonic history as it impacted the generation and locale of natural fracture networks.

According to some estimates, the Elm Coulee Field – first commercialized in 2000 – holds over one billion barrels of oil in place, she said, "and that means less than 15 percent has been recovered."

In 2007, 3-D was shot over a 48-square-mile area for a target below the Bakken.

"What I wanted to do was reprocess this data to understand the structural framework," she said. "In Elm Coulee, optimizing basic processes such as statics and velocity derivation is imperative to achieve the optimal input for migration, which can then be used to predict Bakken depth and the structural network."

With about 100 horizontal Bakken wells drilled and producing over the 3-D area, that background material offered a useful

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development early on, especially in the marine environment.

What a difference a few years – and plenty of R&D – can make.

"In terms of exploration, sales on this type equipment are really beginning to take off," Silvernagle said.

Noting that the technology is gaining significant momentum, he predicted that its evolution will happen at a much faster rate.

"It's been there, kind of laying low for probably the last five years as it began coming online," he commented. "Now that nodes have arrived, the evolution won't be a linear deal anymore – it's going to curve.

"This will happen rapidly as the exploration contractors become more involved and start getting features added to the systems," he added.

Despite the array of providers of cableless systems in general, Houllevigue commented that it's not known if all of the present systems will be available a few years hence or whether there will be some consolidation.

"Cableless technology is still a younger market in terms of technology choice," he said. "There will be expansion.

"In the past two years, I'm seeing more cable crews going to full cableless crews," he added.

"There will always be cable systems," said Roger Keyte, director of marketing and strategy at FairfieldNodal. "But we think that relatively soon, perhaps in a decade, the majority of land seismic data will be collected with nodal systems."

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database to determine what information can be derived from seismic for the Bakken play in Elm Coulee, she said.

"In Elm Coulee, the thickness of the middle Bakken is typically less than 25 feet," she said. "That's very thin, and means seismic methods will have difficulty estimating geological facies variations.

"This put the focus of seismic mapping on really understanding the structural history," she added.

The two most critical seismic picks used to characterize the structural history and tectonics were the Bakken and the Winnipeg just below the Red River. Honsberger began by looking at the Bakken depth surface, computed from integrating the 3-D seismic data and the existing well information.

"Disappointingly, it was an uneventful surface," she noted. "However, as I pulled back layers of earth and looked at the Winnipeg I was able to quickly determine major and minor lineaments form the seismic structure surface at the Winnipeg interval."

But she still needed another approach to map the structural history at the Bakken, so she used the Winnipeg to calibrate, which attributes were most useful at showing lineaments, concluding that dip/azimuth was the best attribute.

In doing so she discovered that the structural lineaments at the Bakken were apparent through attribute mapping – and the fault system interpreted at both the Bakken and Winnipeg provided strong evidence for a large-scale, basement-driven regional strike/slip system that extends across the Williston Basin with primary fracture directions of 45NE and secondary fracture directions of N60W.

The 3-D seismic also provided evidence of geologic features called "flower" structures commonly associated with strike/slip faulting.

"Based on the seismic evidence, the Elm Coulee Field is located on a major strike/slip system in the 3-D area," she concluded, "with potential for other strike/slip faults elsewhere in the field."

Making Connections

Honsberger noted there appear to be compartments within the Elm Coulee field that produce similarly – and prediction of these compartments with better reservoir performance may be possible by combining lineament mapping from seismic with some well production for calibration, she said.

"EUR is basically what we expect wells to ultimately produce," she said.

When EURs for wells within and surrounding the 3-D area were normalized for horizontal well length and then gridded, Honsberger observed that regions within Elm Coulee produce similarly where distinct NE/SW and NW/SE faults may act as fracture propagation barriers between compartments and as fracture fluid thief zones during completion – and possibly as baffles during production.

"These regions with similar EURs may be related to basement-driven 'faulting," she said.

Seismically mapped lineaments could help to define these EUR regions, she said.

"We may be able to high grade these regions," she said. "It could tell us where to drill high EUR wells early."

When the structural lineaments taken from seismic were overlaid onto the EUR map, it was apparent that the possible boundaries mapped strictly from EUR data are very similar to the lineaments mapped at the Bakken level from seismic.

Bottom line: She determined that analysis of the Sleeping Giant 3-D indicates that 3-D seismic is a useful tool for interpreting structural lineaments at the Bakken and Winnipeg zones.

She also concluded these structural lineaments provide strong evidence for tectonic activity that could have influenced Bakken reservoir quality in multiple ways by impacting the depositional environment and the diagenetic alteration processes, and also through the creation of a natural fracture network.

"The Bakken structural lineaments derived from seismic may be useful for defining regions of similar reservoir performance when some well control is available to calibrate the regions," Honsberger said.

"The concept is particularly intriguing," she concluded, "for Bakken fields early in their development life cycle."

Photos courtesy of Southwestern Energy

Destination – Long Beach: from left, Damian Friend, John Jeffers and Rich Whittington.

Cross-country caravan

Geologists Take CNG Road Trip to Convention

By LOUISE S. DURHAM, EXPLORER Correspondent

To no one's surprise, attendees at the recent AAPG Annual Convention and Exhibition in Long Beach, Calif., arrived at their destination via the ordinary modes of transportation, i.e. jet fueled planes and gasoline-burning automobiles, for the most part.

A striking exception was the group of geoscientists from Southwestern Energy Corp. (SWN), who made the trek in a three-vehicle caravan powered by compressed natural gas, or CNG.

The two large SUVs and a truck were driven and occupied by employees from the company's Arkansas and Texas offices. They traversed 2,782 miles, encountering no problems, according to caravan participant and SWN communications adviser Mary Faucett.

The unique expedition was the brainchild of AAPG member Damian Friend, chief geologist at SWN, who first conceived of the idea during the summer of 2011.

He noted there were three things they wanted to accomplish:

- Go to the AAPG annual meeting safely and to make geologic stops along the way for training purposes.
- Advertise and celebrate CNG as an alternative and affordable fuel, while demonstrating a trip that length can be done.
- Use the journey as a recruiting trip for college recruiting.

"When recruiting, we usually talk geology and what we do to explore for oil and gas," said AAPG member John Jeffers, director of geosciences of the Fayetteville shale division at SWN. "In this case the focus was the other end of the process, which is all the success we've had in finding this tremendous resource and what we can actually do with it.

"We think it opened some eyes in this direction," he said.

Planning a Priority

No doubt you're wondering how this high mileage jaunt could happen given the known lack of a significant CNG refueling infrastructure.

It was all about the planning.

Refill availability definitely had an impact on the route taken.

"We googled where to find CNG, mapped it out and made sure the facility was open and operational," Faucett said. "Some were attached to retail stations or even standalone. The private ones were CNG only, such as a mechanical yard, where there was a fleet of vehicles."

Friend noted there was a lack of stations on a part of the route across the Texas panhandle, New Mexico and into Colorado.

Even so, the caravan had to rely on gasoline power for a mere 165 miles during the lengthy trip.

> **There is a need to invest more in infrastructure development to accommodate the growing interest in these vehicles and to support new adapters.**

"One of the neat things about these vehicles is they switch seamlessly," Faucett emphasized. "There's a gauge to let you know it's coming, but you don't notice at all when you run out of CNG.

"We were at a high altitude on the highway the first time, and it just seamlessly switched to gasoline," she said.

"One of the highlights of the trip was meeting other drivers who had been driving CNG vehicles for several years," said AAPG member Rich Whittington, geologist at SWN. "These early adopters were passionate and committed to CNG; they demonstrated the long-term viability of CNG vehicles and praised the economic benefits."

Faucett noted the average price they encountered for gasoline was $3.90/gallon versus $1.65 for CNG per gasoline gallon equivalency. CNG is measured in cubic feet but priced at CNG stations at a per gallon conversion rate so customers can more easily understand it.

Jeffers emphasized the environmental payback with CNG vehicles.

"CNG is a significantly cleaner burning fuel than gasoline or diesel, emitting 30 percent less CO_2," he said. "There are almost no organics or particulates, which is a huge environmental bonus.

See **CNG Caravan**, page 16

Stephen F. Austin, Aberdeen Chapters Win Top Awards

Two student chapters – one U.S.-based, one international – have been named winners of the 2012 AAPG Outstanding Student Chapter awards.

The top winning groups, announced at the AAPG Annual Convention and Exhibition in Long Beach, Calif., are **Stephen F. Austin State University**, in Nacogdoches, Texas, and the **University of Aberdeen**, in Aberdeen, Scotland.

Receiving honorable mention were the student chapters from:

- The University of Utah, Salt Lake City, Utah.
- Universitas Pembangunan Nasional "Veteran," Jakarta, Indonesia.
- The University of Nebraska-Lincoln.
- Institut Teknologi Sepuluh Nopember, Surabaya, East Java, Indonesia.

Two $1,000 scholarships were awarded to the chapter winners and four $250 scholarships were given to the honorable mention chapters, all provided by Schlumberger.

Stephen F. Austin State University's student chapter focused on professional integration, educational opportunities and community service. Events included attending lectures and training sessions from leaders in the petroleum industry, volunteering at the AAPG Bookstore during the convention and organizing community service projects throughout the year.

The University of Aberdeen AAPG student chapter's activities included participating in seminars and technical lectures; launching the "Petroleum Geology in the Heart of Industry" training course, which was jointly hosted with the Bucharest AAPG student chapter; and merging with the Petroleum Exploration Society Great Britain (PESGB) student chapter to create the Aberdeen University joint AAPG and PESGB student chapter.

AAPG has 252 chapters worldwide. Student chapter requirements for selection of awards are maintenance of student AAPG memberships, active AAPG faculty sponsor, participation in the American Geosciences Institute's Earth Science Week, field trips, meetings and special community events, and the use of social media to promote their chapter.

CNG Caravan

from page 14

"Plus, engines don't have the carbon buildup," he added, "so they have an extended life with lower maintenance costs."

Long-Term Benefits

For now, the rub comes in the form of cost to convert vehicles.

Think $5,000 to $8,000 per.

For most individual drivers who tend to rack up "average" mileage, that can be a tough pill to swallow.

There's a definite monetary advantage in converting fleet vehicles, which travel long distances on a daily basis. Financial payback comes sooner rather than later.

According to Steve Mueller, president and CEO at SWN, there currently are more than 110,000 CNG powered bi-fuel vehicles on U.S. roadways. An expanding infrastructure is supporting existing users, but he emphasized the need to invest more in infrastructure development to accommodate the growing interest in these vehicles and to support new adapters.

SWN added more than 100 CNG vehicles to its fleet in 2011 and has plans to convert an additional 66 this year. The company invested in its own CNG fueling station in Arkansas in 2011 and has provided financial support to city-owned stations in the state.

"The company recently gave away 21 already-converted trucks and SUVs to our employees," Faucett said. "There's another employee program to reimburse conversion of their own vehicles."

Orion Sandoval fills the Southwestern Energy SUV with compressed natural gas.

She succinctly summarized the trip statistics:

✓ Total miles: 2,782.

✓ Miles on CNG: 2,617.

✓ Percentage of trip using CNG: 94 percent.

✓ Average price of CNG: $1.65.

✓ Percentage of CO_2 emissions saved: 26 percent.

✓ Fuel cost savings: 51 percent (more than $300 per vehicle).

"If we were able to drive on CNG the whole time, we would have saved 54 percent over the price of gasoline," Faucett noted.

"Fuel cost savings were calculated per gasoline gallon equivalent and on a market by market basis, i.e. the price of filling up on CNG in Denver versus the price of filling up with gasoline," she added.

"When you think that we were a bunch of geoscientists going to the AAPG convention, and we're the ones who find and develop this resource, it was a lot of fun for us to show the end product on a trip to AAPG," Friend said.

"We encountered a lot of enthusiastic support there," he noted. "If we were selling CNG vehicles, I think we could have sold quite a few at the convention."


Photo courtesy of Todd Freeman

Bison and the industry are coexisting just fine on Oklahoma's Tallgrass Prairie Preserve.

Tallgrass harmony

Buffalo Roam as Oil Pumps

By KEN MILAM, EXPLORER Correspondent

Oklahoma's Tallgrass Prairie Preserve is a place of beauty, one of the few surviving remnants of the once-vast North American prairie.

It is home to free-roaming bison and several sensitive and endangered species of fauna and flora.

It's also home to oil production – a lot of it.

In other words, the story from this beautiful slice of the earth is that, with a little effort and understanding by all parties, coexistence seems to be working just fine.

Located in Osage County in the northeastern part of the state, it has been explored and exploited by the petroleum industry for more than a century.

While the 40,000-plus-acre tract is owned by The Nature Conservancy, a group dedicated to protecting and preserving the original character of the prairie, oil activity continues and is even encouraged, according to TNC spokesman Bob Hamilton.

When the Conservancy bought the historic Barnard Ranch in 1989, "Nobody knew who we were ... they thought we were going to sue everybody and shut down the oil patch," Hamilton said.

"Actually, we get along pretty good," Hamilton said. "We're a reasonable bunch of folks. We realize mineral rights are superior to surface rights.

"We try for mutual agreement (on practices) from the git-go. That takes away a lot of the heartburn later," he said.

"We meet (the company representatives) on site, look at their plan, adjust it if it's too close to sensitive features," he explained. "For example, power lines will displace grassland birds ... because they may fear perching predators. We may suggest consolidating where there is already a disturbance – run lines along an existing road, etc.," Hamilton said.

"Birds are also sensitive to sound. They need to hear themselves sing, so a pumpjack may need a good muffler," he said.

"Also our neighbors, ranchers," he added. "Nobody likes to see power lines across open prairie."

Meet the Beetles

Working in environmentally sensitive areas brings other challenges.

Archeological surveys, endangered beetles, Native American mineral rights, groundwater contamination worries and public concerns about hydraulic fracturing are just a few of the factors to consider, said AAPG member Bay Woods, district geologist for Oklahoma City-based Chaparral Energy, one of the companies operating in the preserve's Mississippi Line.

The company currently is doing a microseismic study to monitor the effects of hydraulic fracturing and fluid flow to ensure groundwater is not tainted, Woods said.

Horizontal wells also help minimize surface disturbance, Hamilton said.

Chaparral has one horizontal project working, but the final results are not in yet, Woods said. Other similar sites operate in the preserve, Hamilton said.

While the historic field is "pretty well defined" geologically, taking over old sites sometimes requires more cleanup than the well would be worth, Woods said. It also keeps some smaller companies out of the game.

Constant archeological surveys guard against interference with cultural sites, and the preserve is home to the endangered American burying beetle. If the insects are found in a prospective area, experts bait them away from the work area, Woods said.

"We spend the money and take the hits" to comply with TNC's "best practices" policies, Woods said.

"I think we do a good job," he said.

Invasive species are seen as perhaps the biggest threat to the preserve, Hamilton said.

See **Prairie**, page 20

EMGS is the market leader in a young and dynamic industry. We use our proprietary electromagnetic (EM) technology to support oil and gas companies in their search for offshore hydrocarbons. EMGS has conducted more than 600 surveys to improve drilling success rates across the world's mature and frontier offshore basins. We operate worldwide with main offices in Trondheim, Oslo and Stavanger, Norway; Houston, USA; Kuala Lumpur, Malaysia; Rio de Janeiro, Brazil; and Villahermosa, Mexico.

We are currently seeking candidates for the following positions:

PRODUCT CHAMPION: STRUCTURAL IMAGING

EMGS sees significant potential for developing new markets for its 3D EM services based on new EM technologies that image subsurface resistive bodies, such as salt, basalt, and carbonate reefs, among others. Although some applications of the technology in frontier areas may be useful in conjunction with 2D seismic grids, the main benefit of the technology is likely to be in the arena of improving the performance of 3D seismic imaging in complex sub-salt areas.

This role, probably based in Houston, TX., represents an opportunity to drive the commercialization of an exciting new exploration technology. The successful candidate will have significant commercial and technical experience in seismic imaging.

GEOPHYSICISTS, GEOLOGISTS, PETROPHYSICISTS

EMGS has a number of career opportunities for Geoscientists at various office locations. Our Geoscientists provide integrated 3D EM products to our clients around the world with applications ranging from lead generation, prospect maturation, field appraisal, salt & basalt imaging to regional studies.

The successful candidates will be part of international and interdisciplinary teams responsible for survey planning, processing, integrated imaging & interpretation. The work is carried out with a strong focus on client interaction and collaboration. Willingness to travel internationally is a requirement.

For more information please visit emgs.com/careers.

emgs

Reduced Registration Fee Deadline for ICE is June 27

Registration continues online for this year's AAPG International Conference and Exhibition, which will be held Sept. 16-19 at the Marina Bay Sands Expo and Convention Center in Singapore.

As always, registering early can result in substantial savings; members who register on or before June 27 can save up to $280 off the regular fees.

The meeting theme is "Asia-Pacific Resources: Fueling the Future." More than 400 oral presentations and poster sessions have been selected for the technical program, organized around five areas:

- Exploring and Developing Asia-Pacific's Petroleum Provinces.
- Trap, Source, Reservoir and Seal Definition.
- The Past Is the Key to the Future.
- Facing the Future's Challenges Today.
- New Dimensions in Global Unconventional Resources.

Specific areas that will draw the technical spotlight include looks at the Asia-Pacific's shale gas potential, shale liquids and coalbed methane plays.

Among the special events that will be part of the program:

- A Discovery Thinking Forum, an ongoing presentation of the AAPG 100th Anniversary Committee's program celebrating significant discoveries, for the first time will be part of an ICE.

The forum will feature five speakers who will discuss "Important Discoveries and Creative Thinking," with a special focus on Europe and Southeast Asia.

Those speakers are:

✓ Arild Jørstad, exploration geoscientist, Lundin ("The New Giant Johan Sverdrup Discovery, Norway").

✓ Fred Wehr, exploration and development manager Apache, David Phelps and Eric Phinney ("Two Deep Mungaroo Gas Discoveries in the Carnarvon Basin, Australia – Context and Implications for Further Prospectivity").

✓ Bernard Duval, associate professor, IFP ("Creative Thinking Led to 40 Years of Success in Mahakam, Indonesia").

✓ Lawrence D. "Trey" Meckel III, exploration manager and chief geologist, Tately N.V. ("Exploring a 19th Century Basin in the 21st Century: Seeing the North Sumatra Basin with New Eyes").

✓ Sam Algar, vice president-Asia Pacific exploration, Murphy Oil ("Deepwater Northwest Borneo: Big Oil from 'Gas-Prone' Source Rocks and Leaking Traps").

- Scott Tinker, director of the Bureau of Economic Geology and the state geologist of Texas, will be speaking at the ICE Featured Speaker Luncheon, discussing "The Global Energy Transition: What Will It Take to Make the Switch."
- The movie "Switch," featuring Tinker, will be screened at a special ICE event.

ICE registration and all program details are available online at www.aapg.org/singapore2012.

Remember: June 27 is the deadline for reduced registration rates.

Prairie

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Companies are encouraged to use native seeds when reclaiming sites, he said.

Local Concerns

Hamilton estimates TNC has made about a dozen leases since it bought the land, and several other wells had been in place for years.

The organization charges standard fees for leases and roads, but receives no royalties because the mineral rights in the area are held in trust by the U.S. government for the Osage Tribe. Those dealings are handled by the Bureau of Indian Affairs.

A specific body of law applies in the case of the Osage, because the tribe was "one of the first and biggest in the oil patch," according to Nancy Appleby, a Washington attorney specializing in helping people who do business with Indian tribes.

The Osage "have done quite well developing those resources ... and are more sophisticated in that regard" than some tribes, Appleby said.

Anyone planning to work in so-called "Indian Country" still would be "foolhardy not to be familiar with local politics," she said.

Being aware of what level of government law applies and treating tribes as governments are essential, she said.

Appleby said her "boutique practice" helps bring dollars into Indian Country.

Oklahoma State University is the Conservancy's primary partner in the preserve, and typically has two to three dozen research projects ongoing, including Bison tracking, grassland dynamics and more.

According to Hamilton, more than 180 scientific publications have come out of work at the preserve.

The University of Tulsa is another major preserve partner, Hamilton said.

Salt water and oil remediation studies led to a joint fundraising effort, which led to the building of an Ecological Research Station, Hamilton said.

The 6,500-square-foot facility houses labs, specimen rooms, offices and a classroom that seats 60 for workshops, Hamilton said.

"We're all about research. Things developed here are used on a much broader scale than just the oil industry," he said.

"When we work with companies, we approach it from the science, not emotion," he said. "In the long run it makes economic sense. We think of ourselves as being in the 'business' of conservation."

Historical Highlights is an ongoing EXPLORER series that celebrates the "eureka" moments of petroleum geology, the rise of key concepts, the discoveries that made a difference, the perseverance and ingenuity of our colleagues – and/or their luck! – through stories that emphasize the anecdotes, the good yarns and the human interest side of our E&P profession. If you have such a story – and who doesn't? – and you'd like to share it with your fellow AAPG members, contact Hans Krause at historical.highlights@yahoo.com.

HISTORICALHIGHLIGHTS

Queen turned the tap to open Forties Field

Secrecy Part of North Sea Exploration Life

By PETER J. WALMSLEY


WALMSLEY

I have always counted myself to be one of those lucky geologists who became involved in a major petroleum province before it was discovered and stayed with it until it reached maturity.

The United Kingdom awarded its first round of offshore licences in the southern North Sea in 1964. BP was quickly off the mark and made the first gas discovery at West Sole the following year.

It was while this was drilling that I arrived on the scene – I had been appointed review geologist based in BP's small East Midlands oilfields office, from where the North Sea operation was being run.

It was not an onerous job, as I had only three traded wells to review. (UK allows licensees six years before their data is released into the public domain and therefore companies acquire it by well trades.)

So secret was BP's drilling operation that I was not allowed access to the well data. Nor was I allowed to see any maps; only the senior geologist had that privilege.

Data security was paramount but lacked a budget. I locked away my three sets of well logs with a hasp and padlock bought from Woolworths, while the senior geologist hid his West Sole material amongst the thousands of Coal Measure maps stored in eight large cabinets.

Retrieval presented problems – and some may still be there today!

Risking It All

Following the West Sole discovery I moved to London to undertake my review work amidst a small geophysical team that was struggling to interpret the analog seismic then being acquired.

Upper Permian salt diapirism masked reflections associated with the underlying Lower Permian reservoir, while the existence of multiples and problems of migration and velocity made depth conversion exceedingly tricky. Had the geophysicists not worked wonders, the West Sole well would have missed its target – as did a number of other exploration wells.

By 1966 exploration in the south was in full swing and others were soon making bigger gas discoveries than the 1.5 tcf West Sole field. Meanwhile BP took

See **North Sea**, page 24


West Sole A, the first North Sea production platform, in 1967.

Peter Walmsley going over details with Minister of Petroleum Peter Walker on a visit to the Sea Quest (1972).

North Sea

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delivery of "Sea Quest," the first North Sea semi-submersible rig, which would allow exploration to move into deeper waters to the north.

Early mapping of the 1962 seismic northward had identified an elongated basin running north-south up the center of the North Sea. The lines were widely spaced and the only decent reflector was thought to be the base of the Tertiary. It reached a depth of nearly 10,000 feet in the center of the basin (see map left), and from a structural point of view was completely featureless.

In 1965 the UK embarked on a second round of licensing, including some blocks in northern waters. BP was offered five of these, amongs them blocks 21/9 and 21/10, some 110 miles east of Peterhead. Of all that featureless seismic just one north-south line had shown a very slight turnover. Contouring indicated a nose plunging southeastwardly into the basin running through 21/9 and 21/10.

Throwing caution to the wind we accepted these blocks and the drilling obligation that went with them.

This was in October 1965, and *before* any gas had been discovered in the southern North Sea.

The water depth was around 400 feet, the sea was extremely hostile and there were no rigs available that could drill in such conditions. This was exploration by the seat of one's pants.

We would never have got it through the board today now that risk assessment has been invented!

A Major Discovery

As things progressed in the south a tentative drilling program was taking place up north, both in British and Norwegian waters. Things were not encouraging. Over 50 wells had been drilled before Phillips made their major discovery at Ekofisk in Norwegian waters in December 1969. The race for North Sea Oil was on!

Almost simultaneously Amoco discovered oil in Palaeocene sands in 22/18 (Montrose/Arbroath field). Having contracted Sea Quest to drill this well it was very hard for them to keep the news secret from BP, much as they would have preferred.

By then I was regional geologist and was fully aware of what was going on at Arbroath. Fortunately we soon managed a well data exchange so that I no longer had to keep up the pretense of knowing nothing.

By now we had carried out new-fangled digital seismic across blocks 21/9 and 21/10 and the surrounding areas, and the results were encouraging because we had mapped a large low-relief closure. The Amoco well was of particular interest because Montrose was the first closure down the nose from 21/10 and, importantly, it was full to spill point.

Things were suddenly looking up but disaster nearly struck. One of our senior managers popped his head round my door after having had a convivial lunch with his Shell counterpart and said, "I don't suppose there is any reason why we shouldn't farm out 21/9 and 21/10, is there?"

I guess the expression on my face was answer enough and, fortunately, nothing more was heard of the idea.

Sea Quest quickly moved to drill 21/10-1 and, in October 1970 at a depth of just under 7,000 feet, it encountered oil bearing Palaeocene sands (just three feet from prediction; well done, geophysicists). Subsequent work showed we had 35 square miles of closure, an oil column of just over 500 feet and 4.4 billion barrels oil in place.

A field of major proportions had been discovered.

BP chairman Sir Eric Drake with Her Majesty Queen Elizabeth, inaugurating the Forties Field (1975).

Pin-Point Accuracy

The decision to develop was taken immediately, despite the fact that no one knew quite how it could be done in what was then such deep water.

I remember a discussion about laying a pipeline to shore. Some thought it would collapse under the weight of water while others thought it would float to the surface. Such was the knowledge of offshore

See **Forties**, page 33

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

Photo courtesy of Flickr.com

Palo Duro Canyon State Park, near Canyon, Texas, will be the site of the inaugural Mid-Continent Section's biennial field conference this fall.

REGIONSandSECTIONS

Palo Duro Canyon To Get Starring Role

By CAROL CAIN McGOWEN, Regions and Sections Development Manager

The spectacular Palo Duro Canyon near Amarillo, Texas, will be the destination and focal point of the AAPG Mid-Continent Section's inaugural Biennial Field Conference, which will be held Oct. 5-7.

Registration opens June 5.

Theme for the field conference, which will be hosted by the Amarillo-based Panhandle Geological Society, is "On the Rocks – Palo Duro Canyon: An Exploration of Fluvial Systems and Their Application to the Subsurface."

By offering this first-time ever "biennial" concept, Mid-Continent Section officials are hoping to shine a light on two dynamics:

- The Palo Duro Canyon itself, the second largest canyon in the United States, is a geologic wonderland of Permo-Triassic fluvial depositional sequences comprising colorful sandstones, shales and evaporates that could prove a popular destination for both geologists and the general public.
- Perhaps even more important, the event presents the opportunity for a smaller geological society without the volunteer capacity to hold a Section meeting to benefit from the camaraderie and other rewards of hosting an exciting event that *isn't* an annual Section meeting, which for the Mid-Continent Section are held every other year.

As such, Mid-Continent officials are hoping this inaugural field conference becomes a model replicated by other societies in the Section.

In other words, this could be the start of a schedule where one year would see a Section annual meeting, and the next year an annual field conference.

There was a time when hundreds of geologists worked in Mid-Continent member cities like Amarillo, Ardmore, Okla., and Fort Smith, Ark. In some places those numbers have gone down – the Panhandle Geological Society, for example, has between 80-90 members still working and living in Amarillo.

"For societies with dwindling numbers of interested or available geoscientists, the volunteer capacity to host a Section meeting has also dwindled," said conference general chair and AAPG member John Miesse. "And without hosting the biennial Mid-Continent Section convention, there are fewer opportunities for gathering with fellow geoscientists."

That conclusion led a small group of Section members to envision the field conference.

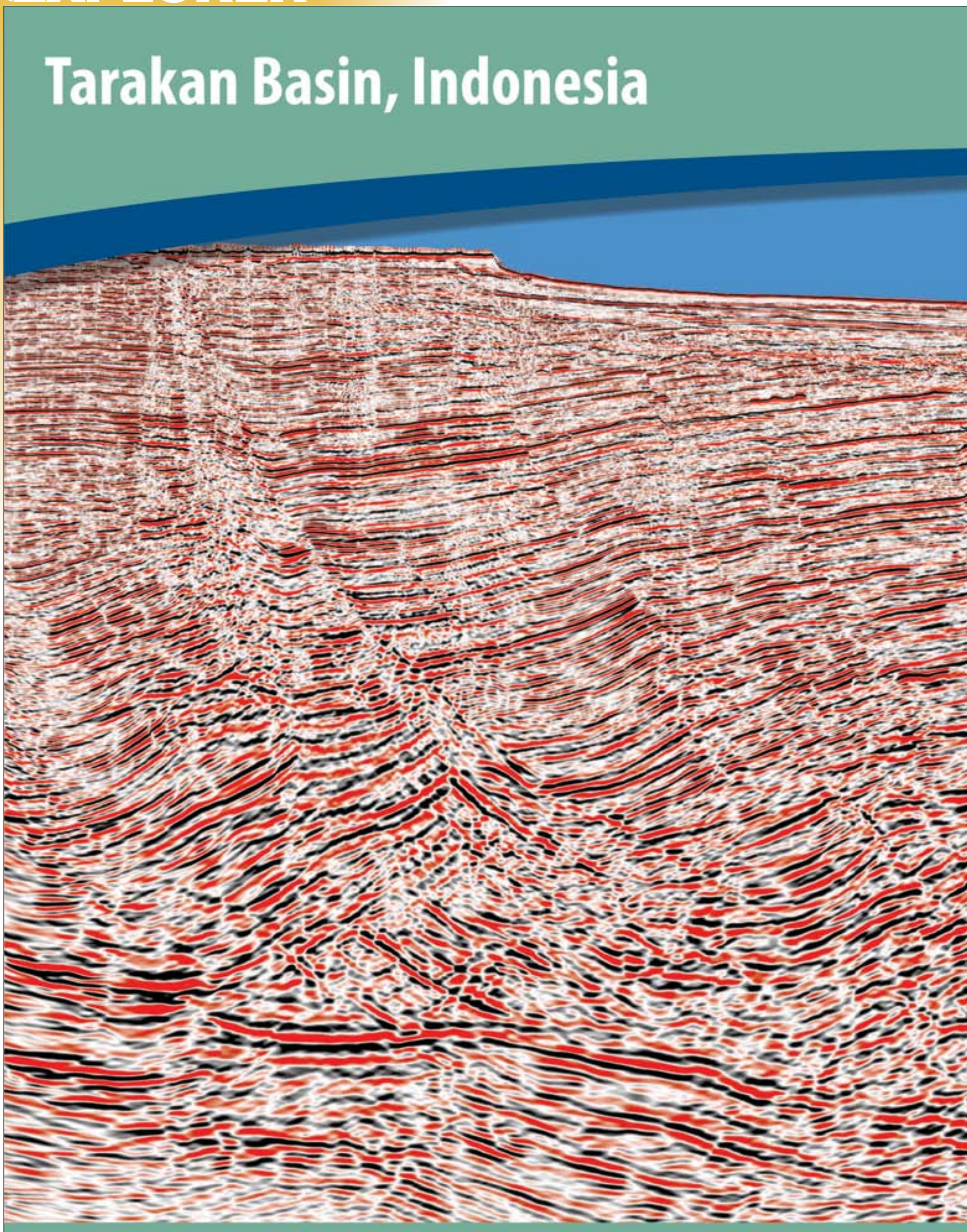
"When the members of an organization gather together in person, the identity of that organization is realized by the unity of purpose and personal magnetism of its members," said AAPG member and Mid-Continent Section liaison Mike McGowan.

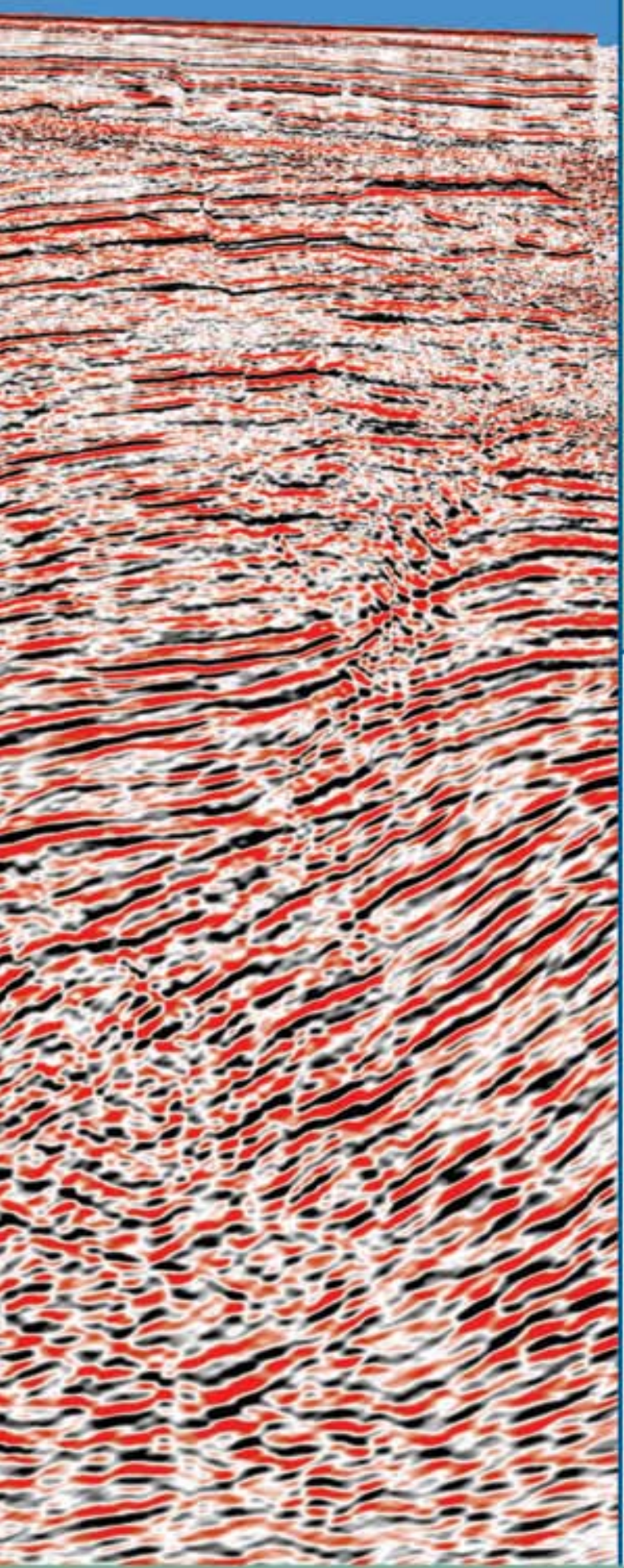
"While the host society busily plans for the meeting and while the Section meeting is occurring, there is a sense of relevance and vitality," McGowan said. "But with a biennial conference schedule, the shared optimism of the gathering is only realized every other year.

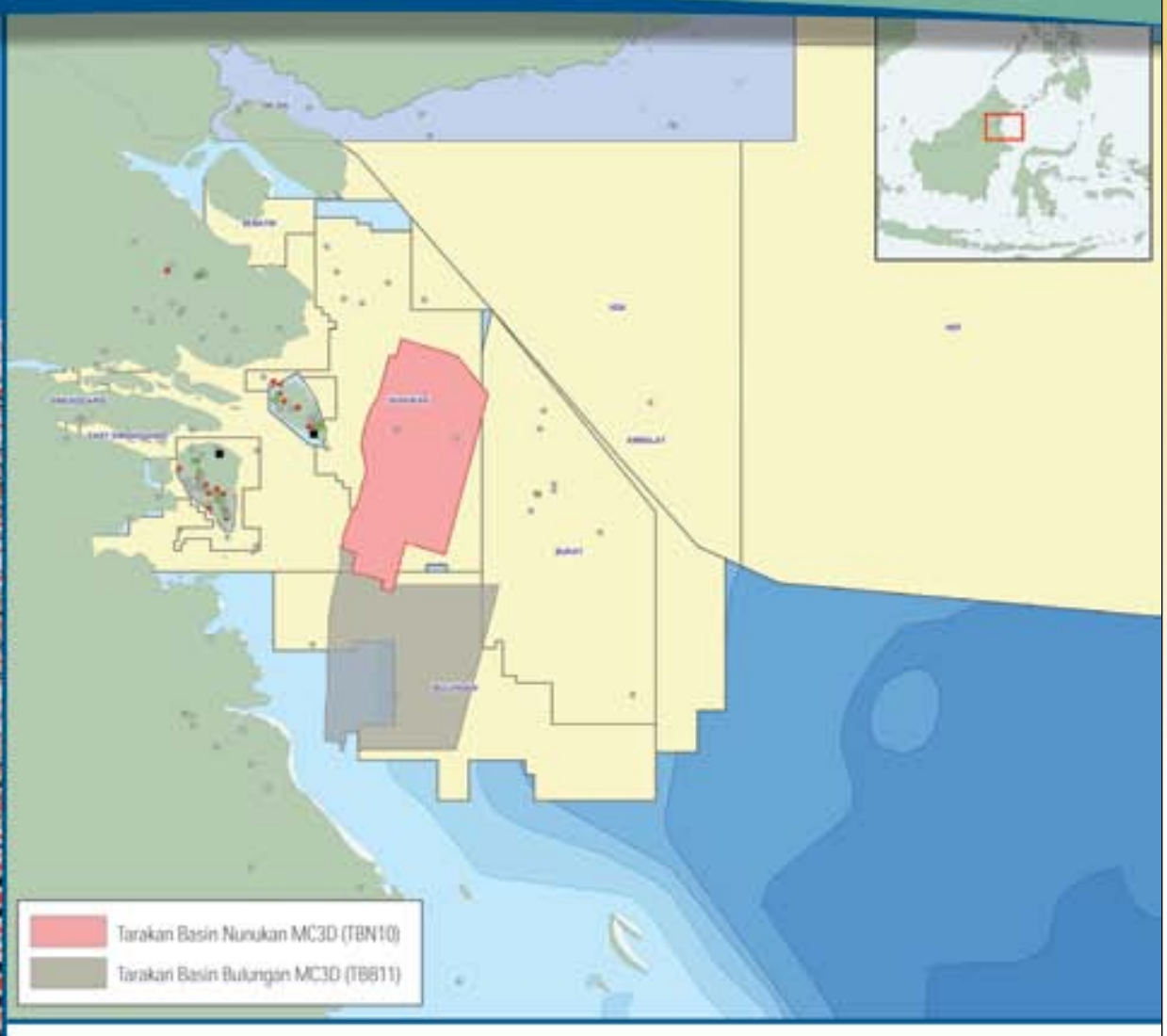
"Some of us in the Section wrestled with how to improve communications within the Section and establish a methodology for meeting in 'off years' as a way to incorporate the smaller geological societies," he added. "We were very excited when the Panhandle Geological Society agreed to host the inaugural field conference."

See **Palo Duro**, page 30

Tarakan Basin, Indonesia







TGS' first multi-client 3D survey in Indonesia was designed to assist in the understanding of the complex structural and stratigraphic setting of this important oil and gas province, particularly in prospect delineation and well planning.

- Tarakan Basin, offshore East Kalimantan, Indonesia
- Acquisition of survey by M/V Seis Quest from 2010 until early 2011
- Aquired in two phases (TBN10 and TBB11)
- Nearly 3,500 km²
- Discovery well, Badik-1 (Anadarko) is covered by the TBN10 phase of the survey

For more information, contact TGS at:
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Email: info@tgs.com

TGS See the energy.

www.tgs.com

Palo Duro

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The Star of the Show

While the PGS stands to benefit from the cause of hosting a conference, the star of the show will be the Palo Duro Canyon.

Estimated at approximately 120 miles long and from 700-900 feet deep, the canyon begins in northeast Randall County, Texas, and continues southeast through Armstrong and Briscoe counties, according to AAPG member H. Charles Hood, of Barbee Exploration in Amarillo.

"Responsible for cutting this winding gorge is the Prairie Dog Town Fork of the Red River," he said. "Several major tributaries contributed to the canyon-making process, creating beautiful, somewhat smaller side canyons."

Rocks representing a time span of some 240 million years are found exposed in the canyon walls, Hood said.

"The Upper Permian Quartermaster Formation is the oldest rock formation found in Palo Duro Canyon and comprises the red lower slopes of the canyon," he continued. "The Quartermaster is overlaid by the Upper Triassic Tecovas and Trujillo formations (Dockum Group), which form the bulk of the rocks exposed and are responsible for many of the spectacular rock shapes seen in the canyon.

"Capping the rock record and forming the steep rim around the upper reaches of the canyon is the late Tertiary Ogallala Formation," he said. "An assortment of eolian 'cover sands' and playa lake deposits dot the present High Plains surface currently visible."

According to Hood, the Palo Duro Canyon forms a re-entrant into the eastern High Plains "Caprock" Escarpment. This escarpment runs in a north-south direction for several hundred miles and forms the natural boundary between the Southern High Plains or Llano Estacado to the west, and the Low Rolling Plains or Osage Plains to the east.

The geology at Palo Duro Canyon State Park is amazing – for both geoscientists and the public. This colorful scene was lit with morning light, turning the canyon into a dazzling rainbow.

An Inspiring Locale

Those interested in being part of the conference might want to act quickly when registration opens June 5: Attendance will be capped at 125 people.

"With narrow canyon trails, smaller groups will visit different locations in the canyon, like Fuzzy's Dome – an exposed series of gypsum anticlines," said program chair and AAPG member Scott Taylor.

And it is something geologists will want to see.

"The Permian and Triassic exposures are unique to the Palo Duro Canyon," he said. "When people come to the area for the first time they realize it's well worth the trip."

In fact, the dramatic canyon scenery is thought to have inspired 20th century American painter Georgia O'Keefe.

Organizers are optimistic that the inaugural field conference will be successful – and going forward, field conferences can be offered again in alternating years with the Mid-Continent Section convention.

The Panhandle Geological Society and the Mid-Continent Section will apply any net proceeds locally and regionally to support high school educational programs and university scholarships for future geologists.

Details can be found online at www.mcsfieldconference.com/2012.

The Geophysical Corner is a regular column in the EXPLORER, edited by AAPG member Satinder Chopra, chief geophysicist for Arcis Corporation, Calgary, Canada, and a current AAPG-SEG Joint Distinguished Lecturer. This month's column deals with locating fluid-contact boundaries.

GEOPHYSICAL CORNER

Seismic and Boundaries: Is It Fluid or Rock?

By BOB A. HARDAGE

Identifying and mapping fluid-contact boundaries within a reservoir system with seismic technology are common objectives when doing a characterization of a hydrocarbon reservoir – and monitoring the movement of fluid boundaries during secondary and tertiary recovery processes of oil always has been essential for optimizing oil production.


HARDAGE

When attempting to analyze a fluid-contact boundary, a seismic interpreter must confront a challenging problem – how do you determine if a particular seismic reflection event is caused by a contact boundary between two different fluids, or by the contact between two different rock types?

Starting in the 1980s people began to see that an efficient way to answer this question was to acquire both P-wave and S-wave seismic data across a rock/fluid system that had to be interpreted.

* * *

An example of a petrophysical interpretation that can be made from a combined analysis of P-wave and S-wave data is illustrated as figure 1.

These seismic profiles, published in 1985, follow the same track across a known gas field.

Three reflection events are labeled on the P-wave profile; two of these profiles are absent on the S-wave profile. The common reflection that appears on both the P-wave and S-wave data is caused by a contact between two different rock types and is labeled as "lithology."

The two events that appear on the P-wave data but not on the S-wave data are contact boundaries between brine and gas.

A second example that also appeared in the 1980s is presented as figure 2. In this prospect area, the challenge was to determine if bold reflection events seen on P-wave data were caused by gas or by coal.

If the cause was gas, the reflecting interface was a contact boundary between two fluids – gas and brine – embedded in the targeted sand interval. If the cause was coal, the reflecting interface was a contact boundary between two different lithologies – coal and its host sand.

Wells were drilled that confirmed the following important findings:

- When a reflection event appeared on both P-wave and S-wave data, the event was caused by the contact between two different lithologies.
- When a reflection event appeared on P-wave data but not on S-wave data, the event was caused by a fluid-contact boundary (brine and gas in this instance).

Continued on next page

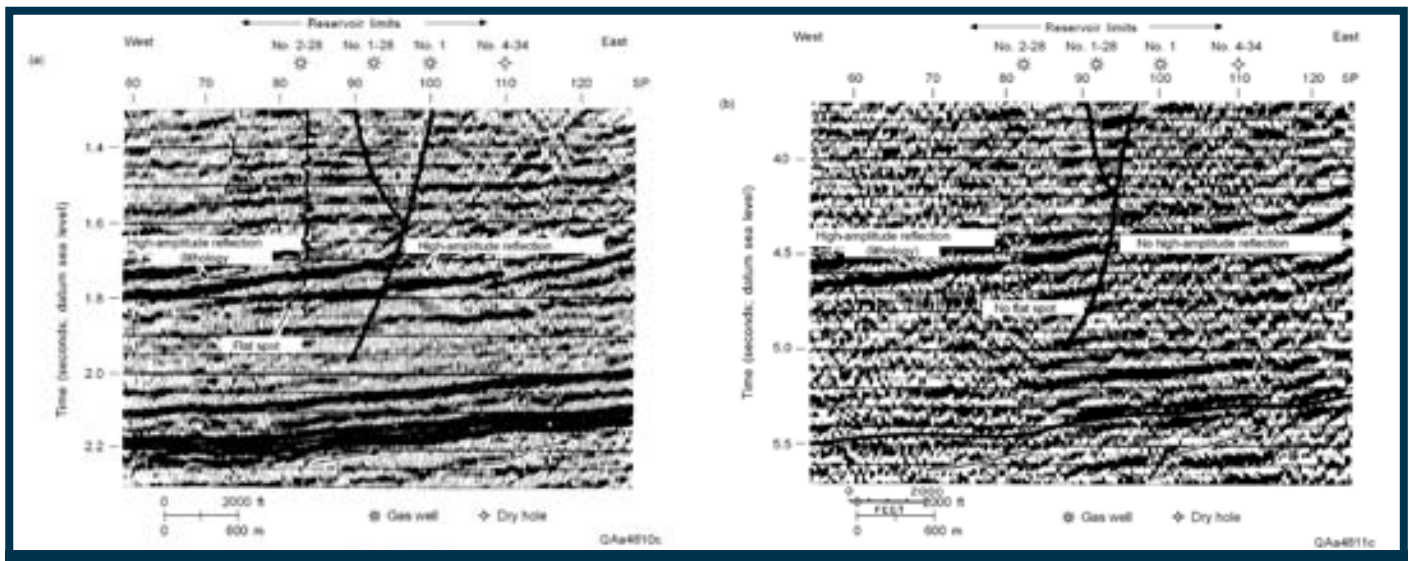

Figure 1 – P and S reflection images recorded along the same surface track across a gas reservoir. P-wave reflections (a) occur at gas-water fluid boundaries (labeled "Flat spot" and "High-amplitude reflection"), but S-wave reflections (b) do not. Both images show a high-amplitude reflection at a known lithological boundary (labeled "lithology"). In this example, an interpreter could use well control to identify which P-wave reflection marks a fluid-contact boundary. In areas with little or no well control an interpreter will benefit by having both P and S images and using a comparative method such as demonstrated here to identify reflections associated with fluid-contact boundaries. Data examples taken from Ensley (1984).

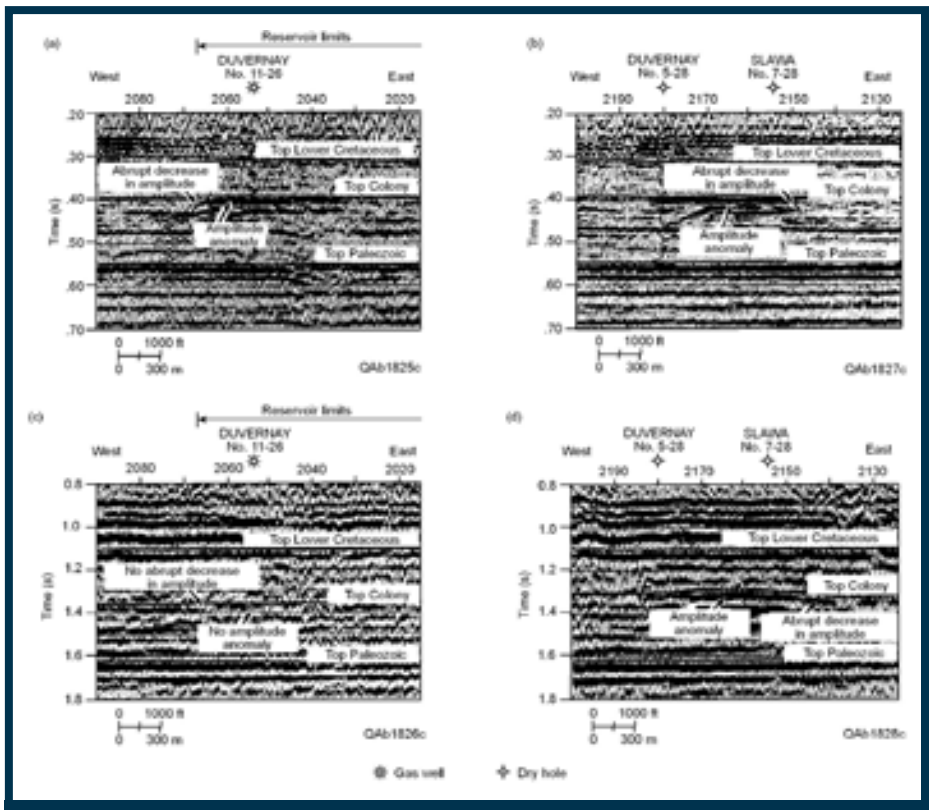

Figure 2 – Use of P and S reflection data to distinguish gas sandstone reservoirs from lignite beds. Both gas-brine contact boundaries (a) and lignite-sand contact boundaries (b) generate strong P-wave reflections compared with P-wave reflection amplitudes at laterally equivalent brine-saturated sandstones. In contrast, S-wave reflections associated with gas-brine contacts (c) tend to be the same magnitude as those at laterally equivalent brine-saturated sandstones, but S-wave reflections associated with lignite-sand contacts (d) create a bright-spot reflection just as P-wave data do. Lignite can thus be distinguished from gas reservoirs if both P and S data are used in this comparative manner. Data examples taken from Ensley (1985).

Continued from previous page

* * *

The P-wave and S-wave seismic data displayed on figures 1 and 2 illustrate some important principles.

▸ First, P-wave seismic wavefields reflect from boundaries created by the contact between two different lithologies and also from the contact between two different pore fluids embedded in a constant-matrix host rock.

In contrast, S-wave seismic wavefields reflect from boundaries between contrasting lithologies but do not reflect from fluid-contact boundaries unless there is a significant change in bulk density across the fluid boundary.

Even when there is an appreciable change in bulk density between two contacting fluids, an S-wave reflection tends to be weak compared to the bold nature of its companion P-wave reflection from that same fluid-contact boundary.

▸ Second, when it is critical to identify and monitor fluid-contact boundaries, both P-wave and S-wave seismic data should be utilized.

S-wave data are needed to identify which P-wave reflections are associated with fluid boundaries; P-wave data are needed to map and quantify calendar-time changes in any reflection event that has been identified as a fluid-contact boundary.

These well-established seismic principles are becoming more important now that there is increasing emphasis to sequester CO_2 in brine-filled reservoirs.

(Editor's note: Bob A. Hardage is senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. He was the past editor of Geophysical Corner and is currently serving as president of SEG.)

Forties
from page 24

technology at that time. How things have changed in 40 years!

The field was given the name "Forties." "Forties" is a fishing/meteorological area so called because it occupies a large part of the North Sea that is almost universally 40 fathoms (240 feet) deep. It was ironic that our Forties Field was discovered in the only part of that area that was around 400 feet deep!

Five years later the first of four production platforms was in place and drilling had commenced. The pipeline to shore had been laid (without collapsing or floating) and an operations HQ had been set up in Aberdeen, Scotland.

All was ready for Her Majesty the Queen to visit Aberdeen on Nov. 3, 1975, for a grand celebration – during which she pressed the button that allowed first oil to come ashore.

Full marks must go to the geophysicists whose painstaking work led to the discovery of the Forties structure.

For my part I felt much gratification at being the guy that stuck the pin in the right place on one of their maps.

Editor's note: Peter J. Walmsley, MBE, spent his entire working career with BP and its associated companies until 1981, when he was recruited to the UK Department of Energy to become director general, Petroleum Engineering Division, with responsibility for all things technical, ranging from geology to the safety of divers. He retired in 1989. During his time with BP he served in the Middle East and Trinidad before returning to the UK to work on the North Sea. He became exploration manager, Aberdeen, prior to returning to London as deputy chief geologist. He was honored with the MBE (Member of the Order of the British Empire award) by Her Majesty the Queen in 1975 for his part in the discovery of the Forties Field. He now lives in retirement in Surrey with his wife, Edna.

SPOTLIGHTON

An independent adventurer

For Pioneer, the Journey is a Destination

By BARRY FRIEDMAN, EXPLORER Correspondent

Timothy T. Schowalter, who just received this year's AAPG Pioneer Award in Long Beach, Calif., has a confession to make about two of his most important and celebrated published works.

"I knew nothing about the problem when I started."

The papers, "The Mechanics of Secondary Hydrocarbon Migration and Entrapment" (1979) and "Interpretation of Subsurface Hydrocarbon Shows" (1982), were revolutionary when they were presented and are still being discussed at conferences, cited in industry journals, studied in universities and, most importantly, used by explorationists to find more oil.


SCHOWALTER

> "The oil and gas business is one of the most open and uninhibited businesses in the country," he said. "You can't build a car by yourself, but you can get going in the oil business with an idea or a key lease on a successful well."

"I think the reports are still used," he says now, more than 30 years later, "because they are an interdisciplinary bridge between engineering and geology."

Not that he knew that when he began work on them at Shell Development in Houston in the early 1970s.

"I had to learn as much as possible about two phase fluid flow," he said, "and *then* develop a model on how to use that knowledge in exploration and production."

His lack of knowledge, he concluded, would be fortuitous. He told his supervisor, fellow AAPG member (and eventual AAPG Grover Murray Distinguished Educator Award winner) Larry Meckel, that since he had no preconceived notions about the results, the research might be groundbreaking.

They were.

But first he had to get them published.

"Before computers it was very slow to do a paper," Schowalter said. "Each paper took two and a half years working one night a week after work. I even did my own drafting for the paper and paid a neighbor high school girl to type up the final copy."

"After writing the first paper I was so uncertain as to what to do with it that I sent it to the Wyoming Geological Association for publication in their Earth Science Bulletin," he recalled. "After the paper was well received, friends encouraged me to send in to the AAPG, who then published it."

The "migration" paper eventually won Schowalter the 1980 AAPG Cam Sproule Award; the "shows" work was the basis for his AAPG Distinguished Lecture tour.

Both Sides Now

Schowalter's career took him to Casper, Wyo., where he worked as a geologist with Kirkwood Oil, and to Denver, where he was first an exploration manager Mosbacher and Pruet and then an explorationist for both BWAB and D.C. Dudley and Associates.

"The oil and gas business is one of the most open and uninhibited businesses in the country," he said. "You can't build a car by yourself, but you can get going in the oil business with an idea or a key lease on a successful well."

An independent contractor since 2004, Schowalter has seen the industry from more than two sides.

"I think the big difference between the big companies and the independents is that in small companies or working for yourself, you have to be involved in the entire process and get to see how the whole system works," he said. "Like most independents, I have been involved in land, seismic, permitting, drilling completion, geology, selling deals, etc."

And that "etc." is huge – from his work in the office to what he does when he leaves.

Schowalter has not only climbed all 54 of Colorado's 14,000-foot peaks, is not only a world cross-country skier, but has traveled across America – on a bicycle.

"I still have vivid memories of each day."

In undertaking the excursion, he says his motivation was to see, mostly, if he could do it – the unfolding geology along the way was

See **Schowalter**, page 36

"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.

PROFESSIONALnewsBRIEFS

Lawrence "Larry" Anna, to consultant, Anna Geoscience, Denver. Previously geologist, U.S. Geological Survey, Denver.

Jason Beall, to senior geophysicist, Rialto Energy, London, England. Previously senior geophysicist, Apache Canada, Calgary, Canada.

Charles Burshears, to geologist/member Northwest Oil and Gas, Fort Worth and Oklahoma City. Previously geological manager, XTO Energy, Fort Worth.

Albert N. Dickas' book, "101 American Geo-Sites You've Gotta See," has been published by Mountain Press Publishing. Dickas resides in Blacksburg, Va.

Dale A. Fritz, to exploration vice president-Mid-continent, Devon Energy, Oklahoma City. Previously geological manager-Permian basin Texas district, Devon Energy, Oklahoma City.

C. Robertson Handford, to consulting sedimentologist and sequence stratigrapher, Mountain View, Ark. Previously senior geological adviser, Hess Corp., Houston.

Alan Hart, to global geological adviser, SK Innovation, Seoul, South Korea. Previously managing director, Golden Downs Consulting, Wakefield, New Zealand.

Tim Hunt, to geoscience coordinator, Trey Resources, Midland, Texas. Previously senior geologist, University Lands-UT system, Midland, Texas.

Walter Lamle, to geoscience manager-Anadarko Basin business unit, Devon Energy, Oklahoma City. Previously senior geological adviser-Texas Permian Basin, Devon Energy, Oklahoma City.

Richard Redhead, to exploration manager-new ventures, Talisman Energy Services, The Woodlands, Texas. Previously G&G operations manager, Nexen Petroleum, Plano, Texas.

Neville Smith, to senior exploration geologist-Taranaki team leader, OMV New Zealand, Wellington, New Zealand. Previously chief geologist, Todd Energy, Wellington, New Zealand.

Schowalter

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going to be a bonus.

"One of the great pleasures of being a geologist is to be able to explain the landscape, so it was fun to put the trip in a geologic perspective as we traveled along."

He traveled with a dozen men from all over the world.

Work was never too far away.

"I would usually give a brief geology lecture at dinner about the day's ride."

The trip, from Seattle to the eastern coast of New Jersey, took seven weeks and averaged about 80 miles a day.

"I went through two sets of tires on the trip," he says of the 3,500 miles, "and I ate like a horse to keep going."

He says one of the best parts of the trip was the luxury of escaping the day-to-day.

"Each day was eat, ride and sleep and do it all over again," he said. "It was like a train you couldn't get off."

> **"I don't have a clue what I would be doing if I hadn't been in the oil business, but whatever it was, I am sure it wouldn't be as interesting or as much fun."**

The One That Got Away

As it turns out, Schowalter likes all the trains he rides.

"I don't have a clue what I would be doing if I hadn't been in the oil business, but whatever it was, I am sure it wouldn't be as interesting or as much fun," says a man who has been an AAPG member since 1968.

"The biggest change in the industry over four decades is the change from exploring for conventional traps to exploring for resource plays," he said.

Also, he adds the advent of modern hydraulic fracturing and horizontal drilling has allowed the industry to make a profit producing from really bad reservoirs.

"In fact the 'waste zones' I wrote about are now the target for most exploration in the United States," he said.

Like any pioneer, Schowalter knows that success and failure are often within sight of each other.

"The best achievement is that I have been involved in finding enough oil that I can work for myself, he said. "I am proud that I took the leap to risk my own money on leases, drilling and completion with enough success to be a small one man oil company."

Like a fisherman, though, there was one that got away.

Along with Steve Kirkwood, Schowalter mapped out a Red River waste zone in North Dakota.

"Our companies at the time had the play leased and sold for a horizontal Red River well, but the company never drilled the well," he recalled. "The leases were then picked up after ours expired by BN and Continental and became the 200-million-barrel Cedar Hills oil field."

And maybe that's why Schowalter – like any good geologist, like any good fisherman, is still out there, still enjoying it.

"I am," he says, "still looking for the big one."

The Future Is Now: ACE Turns the Sp

By VERN STEFANIC, EXPLORER Managing Editor

The event featured a cast of thousands, sure, but the stars of the show definitely were those who were providing creative scientific thought, exciting tales of exploration successes and dazzling, cutting-edge technology.

The 2012 AAPG Annual Convention and Exhibition, held for the second time in five years in Long Beach, Calif., and featuring the location-inspired film theme of "Directing the Future of E&P," attracted 5,272 attendees from 72 countries.

Hosted by the AAPG Pacific Section and chaired by Kay L. Pitts, of Aera Energy, the meeting featuring a comprehensive technical program of 416 oral and 628 poster presentations, ranging in topics from emerging frontiers to active oil and gas fields; structural geology and neotectonics to geosciences principles and applications; and a healthy dose of carbonates, siliciclastics and unconventional reservoirs.

"We continue to hear how much people enjoyed the convention, how much they learned, the connections they made and how much they enjoyed Long Beach," Pitts said. "One of the Monterey shale workshop attendees told me that it was the best core workshop they had ever attended.

"We're very pleased the convention came off so well," she added, "and (it) has every indication of being more financially successful than forecast."

The technical program was complemented by the large, often high-tech dominated and always impressive displays found in the exhibits hall, which boasted 224 exhibitors, including the popular International Pavilion.

Indeed, other than a few technical session rooms that were filled to overflowing (the technical program was "timely and top-notch," Pitts said), ACE 2012 proved to be a relatively crisis-free convention, allowing everyone's attention to remain focused on the papers, posters and other activities.

"The History of Geology forum kicked off the technical meeting with one of the larger audiences it has had," Pitts said. "The shale session and Discovery Thinking forum were both standing room-only, with folks waiting to get in between talks.

"The room was full for the Halbouty lecturer John Grotzinger," she continued, "and the All-Convention Luncheon speaker, Robin West from PFC Energy, kept the near sell-out audience spell bound."

Grotzinger's talk, in a bit of a departure for the annual Halbouty lecture, focused on current exploration efforts of Mars; West talked about the future of deepwater exploration, and while he discussed the current success stories that can be found offshore Brazil and western Africa he also

The top 10 most highly represented countries at ACE 2012:

- United States – 3,934
- Canada – 275
- United Kingdom – 242
- China – 115
- Norway – 63
- Australia – 62
- Brazil, Saudi Arabia – 53
- France – 44
- Nigeria – 34
- Mexico – 30

Attendance by Region

- Europe Region – 275
- Canada Region – 257
- Latin America Region – 149
- Middle East Region – 96
- Africa Region – 84
- Asia/Pacific Region – 82

otlight on Science and Creativity

talked about North America as being the "world's hottest investment destination," a "stunning" development that is bringing about a surge in production that "is extraordinary."

Although several events were slated earlier in the weekend, Pitts officially started ACE with Sunday's opening session, held in a nearly filled-to-capacity ballroom and featuring the presentation of AAPG honors and awards plus Paul Weimer's AAPG Presidential Address.

Weimer's talk focused largely on AAPG historic, current and projected demographics – a topic also covered in his May EXPLORER President's Column – calling those trends "critical" factors that the membership must consider.

Weimer, in endorsing past president Dave Rensink's 2011 ACE address that challenged AAPG to think strategically about where it wants to be in 2035, presented detailed charts and data to provide a context for the decisions that loom – "a look at membership trends since 1979, and what the implications of our policies have been."

The data showed AAPG membership trends growing older over the past several decades – "they show the overall migration of membership at this time," Weimer said as he presented data showing what was similar to decline rates of a well.

"The point is actually pretty obvious," he said. "The 'Baby Boomers' are now in a similar decline curve as the 'Long-in-the-Tooth' forefathers, and, obviously, for AAPG to maintain its large number of members we're going to have to recruit a lot of new members to succeed the Baby Boomers.

He also talked of the need for AAPG to attract younger geoscientists from the world's diverse talent pool.

"As we honor the past we also have to begin to ring in the new," Weimer said. "I think our best path forward is the influence that we've already earned – apply it to new learnings to grow membership and long-term health of our organization."

Other meeting highlights included:

▸ AAPG Foundation chairman Bill Fisher, in remarks to the All-Convention Luncheon, announced the successful conclusion of the Foundation's financial campaign – donations have exceeded the original goal, standing now at $35.6 million. Additional pledges are yet to be recorded before the final totals are announced.

▸ For the first time ever, the awards ceremony for the Imperial Barrel Award finals competition was held on Sunday before the opening session and open to the public. The University of Louisiana-Lafayette won the top prize. (See related story, page 42).

▸ The International Pavilion in the ACE exhibits hall attracted representatives from 18 countries presenting available E&P opportunities.

In addition to exhibiting at the IP, the Lebanon Minister of Energy and Water, Gebran Bassil, briefed media and other interested parties of the country's upcoming first offshore licensing round.

Bassil has said Lebanon hoped to have exploration contracts with international oil companies signed and sealed by the end of the year.

▸ A special showing of the commercial film "Switch," featuring past AAPG president Scott Tinker, was offered to a near sell-out crowd at a large Long Beach theater. Tinker and director-producer Harry Lynch led a Q&A after the showing.

Pitts was quick to point out the meeting's success was largely the result of dedicated volunteer workers.

"It was very gratifying to be involved with the wonderfully cohesive organizing and technical committees," Pitts said. "The AAPG ACE continues to offer the highest value experience overall for petroleum and energy geoscientsts."

HoD Passes Member Simplification Plan

Delegates passed the Membership Simplification plan by the necessary two-thirds margin at the House of Delegates meeting in Long Beach, Calif., reducing the number of member classifications for the Association.

A second amendment proposal concerning Advisory Council notification to the chair of the House of the possible changes to the long-range plan or Bylaws failed by a 84 for, 93 against vote.

Of 218 total delegates, 188 received voting credentials at the April 22 meeting chaired by Jeff Lund at the Long Beach Convention and Entertainment Center.

The Membership Simplification proposal originated from the AAPG Membership Communications and Coordination Committee, and eliminates the word "Active" as an adjective for the member class.

The new amendment also moves Honorary and Emeritus to the designation of "Members," rather than separate and distinct membership classes, Lund said.

There were 45 minutes of discussion on the issue, culminating in a 127-53 vote approving the change. The measure required 126 votes to pass.

With the vote of the House, AAPG now has three membership classifications – Member, Student and Associate. (See accompanying article on this page).

Societies approved for affiliation are:

- Israel Geological Society (part of the Europe Region).
- Indian Association of Petroleum Geoscientists.
- Geological Society of Romania.

Delegates also elected new officers, with **Larry Wickstrom**, former state geologist and division chief, Ohio Geological Survey, voted as chair-elect and **Karen Glaser** as secretary/editor. She is geological adviser and director of curriculum for geoscience, Schlumberger, Houston.

Both will assume office July 1, and Wickstrom will chair the House in 2013-14.

Delegates also honored **Larry Jones** with the House's Honorary Member Award; **George Eynon**, **Jeannie Fisher Mallick** and **Vlasta Dvorakova** received House Distinguished Member awards; **Ed Dolly** and **Clint Moore** received House Long Service Award; and outgoing officers Lund and secretary/editor **David Cook** received the Recognition of Service Award.

Simplification Plan A Step in Process

By JEFF LUND, Chair, AAPG House of Delegates

The goal of the Bylaws amendment passed by the HoD, a proposal from the Membership Communication and Coordination Committee, is to increase AAPG membership by encouraging all qualified geoscientists to join AAPG as described in our Strategic Plan.

The amendment came to the House as a result of a Resolution by the AAPG Executive Committee and was unanimously supported by the House of Delegates Leadership.

The amendment is straight-forward:

- Remove the term "Active" from "Active member."
- Make "Emeritus" and "Honorary" member classes special designations of "Member" instead of separate classes.

There are no changes to dues policy, requirements or procedures for Honorary or Emeritus designations; they are simply now designations of the Member class instead of separate classes.

This is, in effect, an administrative change and has not diminished the status or prestige of "Honorary" or "Emeritus" designations.

The removing of "Active" from the class name minimizes any implication that the member is required to be an "active" participant in AAPG (serve on committees, chair sessions, volunteer at events, etc.)

Also, note that the Bylaws currently preclude Students and Associates from referring to themselves as members of AAPG (refer to Article 1 Sections 1 and 2 of the Bylaws).

The amendment's Item 2 simplifies the AAPG classification scheme to three classes (Member, Student, Associate) from the current five classes (Active Member, Honorary, Emeritus, Student, Associate).

The amendment also brings additional benefits:

- It will allow the flexibility to include additional special designations of the Member class, such as "Certified" and "Young Professional," if such recommendations are forthcoming in the future.
- It minimizes the perception that there is a hierarchy of member classes, which was an issue raised at the 2010 House meeting. Honorary, Emeritus and future designations are not inherently "better" or "lesser" than each other, and indeed an AAPG member might be the recipient of more than one such designation as they achieve certain distinctions.

The AAPG Membership Committee has brought forth several proposed changes over the past several years and the new Membership Simplification amendment is simply the next step in that ongoing process.

Previously the House of Delegates has approved Bylaws amendments establishing:

- Graduated dues.
- Change in the Active member experience requirement to one year.
- The "Student Bridge" option for reduced dues.

All of these changes have been aimed at achieving AAPG's strategic goals and making the membership application process more welcoming and inclusive to qualified applicants. E

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They are the champions: UL faculty adviser Brian Lock with the IBA winning team, from left, Mike Lahey, Chris Bijan Hatamian, Sarah Beth Maxwell, Joey Grimball and Daniel Dudley.

Barrel Winner ULL A Perennial Competitor

BY BARRY FRIEDMAN, EXPLORER CORRESPONDANT

That the University of Louisiana at Lafayette won this year's Imperial Barrel Award over colleges and universities from around the world may have surprised some – just not anyone who connected with the school.

"Not to be arrogant, but we always knew we could win it," said AAPG member Brian Lock, an award-winning professor at UL Lafayette who was the team's faculty adviser for the competition.

AAPG's Imperial Barrel Award Program (IBA) is an annual prospective basin evaluation competition for geoscience students that's become a global sensation. Prizes and scholarships are awarded, but what's really coveted is the chance to compete and excel among, literally, the best student geoscience programs in the world.

And Lock, who received AAPG's Grover E. Murray Memorial Distinguished Educator Award in 2006, wants to dispel any notion of UL's win being an upset; this was not Butler sneaking into the NCAA basketball finals.

The school, which won the first prize of $20,000, deserved its place at the table.

"We won the Gulf Coast Section in 2008 (got to the final six internationally that year), won the Gulf Coast again in 2010 and were third to UT in 2011."

UL's IBA championship team consisted of AAPG members Joey Grimball, Mike Lahey and Chris Bijan Hatamian, plus Sarah Beth Maxwell and Daniel Dudley.

"This was the best experience of my academic career," team captain Grimball said. "To actually win the international competition is a dream come true. This is an experience I will cherish for the rest of my life."

Lock's confidence comes from not only the quality of the students – which was obvious to most IBA observers – but from the courses UL offered in preparation.

"We had the background already. All of our courses emphasize practical, petroleum-related aspects of geology," he said, "and we have independent, industry-sponsored subsurface mapping projects for the stronger students at the senior undergraduate/graduate level and a series of seismic geophysics courses.

"A good proportion of our students come from all across the United States," he added, "and we are not a regional program in that sense. Students are attracted to UL by the strong petroleum emphasis."

2012 IBA Winners

✓ First place (Imperial Barrel Award) – University of Louisiana at Lafayette.

✓ Second place (the Seeley Cup) – Khon Kaen University, Muang District, Thailand.

✓ Third place (the Stoneley Medal) – Colorado School of Mines, Golden, Colo.

A Profitable Partnership

By Lock's own admission, the program, which has 60 master of science students, is underfunded and has a small faculty (there are presently 12 faculty members on the School of Geosciences), but he says the program and its students are strongly supported by the local petroleum industry.

"Lafayette has a fairly large number of geologists working for small and medium sized companies who are extremely supportive," he said. "These companies are mostly in walking distance of campus and our students are welcomed at monthly meeting of the Lafayette Geological Society, the Southwest Louisiana Geophysical Society and the local SPWLA chapter."

Partnerships between universities and industry are nothing new, but in Lafayette, the relationship is symbiotic.

"A high proportion of our students work part-time as geotechs with these companies," he added, "and many have

See **IBA Winners**, page 54

Foundation Donors

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

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

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

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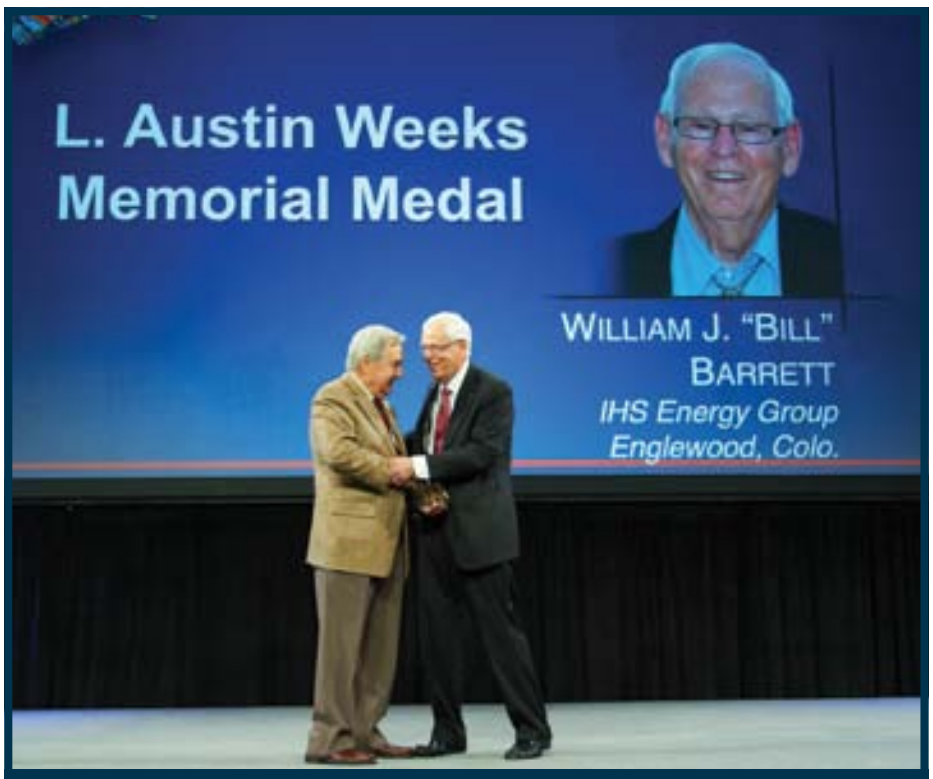

AAPG Foundation Chairman Bill Fisher presents the Weeks Medal to Bill Barrett in Long Beach.

His advice: 'Get involved'

Bill Barrett Earned Achievements

By LARRY NATION, AAPG Communications Director

William J. Barrett, a Kansas native who rose to become one of the profession's top explorationists and company-makers, added to his long list of accolades with acceptance of the L. Austin Weeks Memorial Medal at the AAPG Annual Convention and Exhibition in Long Beach, Calif.

In accepting the Foundation's highest honor, Barrett encouraged the opening session crowd of over 1,200 to "get involved and support the profession through the AAPG Foundation."

His words should be heeded, for his vision and choices has brought him a storied and half-century-plus career of success, building four successful companies with exploration geology at the core.

Barrett – and companies under his leadership – found and developed 10 giant or near giant size oil and gas fields and a number of smaller fields throughout the Rockies.

He didn't get a running start on his career. Barrett's achievements were earned. He was born nine months before the Great Depression hit into a poultry-farm family with nine siblings.

In 1959, after working on the family poultry farm and a stint in the U.S. Army after being drafted, he obtained a master's in geology from Kansas State University on the GI Bill. He launched his geology career as a stratigrapher for El Paso and later as chief geologist Wolf Exploration/Inexco. It was a well initiated by Barrett that was the discovery of the 200 million-barrel Hilight oil field.

Only a year later, Barrett's geology led to the discovery of the Madden gas field, which is still being developed. He continued to make finds in Colorado's Piceance Basin.

When Wolf relocated to Houston, Barrett – by then the father of seven children (the Barretts later had three more) – decided to stay in Denver and formed B&C Exploration, which in 1971 merged into Rainbow Resources.

Barrett then funded a new private sole proprietorship, Aeon Energy, a precursor to the privately held Barrett Energy Company.

Barrett and his partners discovered enormous resources in North Dakota's Williston Basin. In 1978, Rainbow sold for $40 million, to Tulsa-based Williams Cos.

The third public company Barrett launched, Barrett Energy Co., was begun in 1981 and went public in 1983 as Barrett Resources and recorded big successes, becoming one of Colorado's largest independent oil and gas companies.

A buyout of Plains Petroleum in 1995 created the sixth largest natural gas operator/producer in the giant Hugoton gas field in southwest Kansas.

Soon after selling Barrett Resources for $2.8 billion in 2001, again to the Williams Cos., Barrett was happily settling into retirement when in 2004 his geologist sons, Fred and Terry (both AAPG members), suggested a venture too good to pass up.

Bill Barrett Corp. was formed and its work in Utah's Uinta Basin earned Oil and Gas Investor's 2005 Excellence Award for Best Discovery. The New York Stock Exchange-listed company now has over 300 employees and continues exploring in the Rockies.

He retired, for the third time, in 2007.

Throughout his career, Barrett has been involved in numerous charitable activities.

An AAPG member since 1961 and AAPG Foundation Trustee Associate since 1998, he received the AAPG Norman H. Foster Outstanding Explorer Award in 2003, and in 2009 was named one of AAPG's "100 Who Made A Difference."

He has been an integral working member of the AAPG Foundation, where he has served as a Foundation Trustee and on the Financial Campaign Committee. Last year he was recognized as a member of the AAPG Foundation Legacy Society and became an AAPG Foundation Trustee Emeritus.

WWW UPDATE

A few of the many members of the video award-winning AAPG Suez Student Chapter.

Videos tell about chapter with pictures, music

Student YouTube Videos Report Good Vibes

By JANET BRISTER, AAPG Website Editor

Every year AAPG's Student Chapter Committee looks for ways to engage student chapters from all over the world in AAPG activities.

According to Richard Ball, chair of the AAPG Student Chapters committee, they are "constantly working to develop new programs to engage and retain students."

During discussions in August at the Student Chapter Leadership Summit, annually submitted student chapter reports became the focus.

Most years, Mike Mlynek, AAPG assistant membership manager, has received student chapter reports in a written format. He also observed that many of these chapters were "using Twitter and well-designed web pages to do great things with their chapter." But apparently that wasn't coming across in the report.

As the discussion progressed they realized some of these reports didn't reflect the involvement and activity as well as student chapters' Facebook pages, Twitter feeds or websites.

Then some chapters submitted their reports in video format but not written. This inspired the group to organize a YouTube video contest.

Take It To The … Internet

The contest was announced in February and student chapters had until March 3 to submit a link to their five-minute (or less) video posted to YouTube.

Once Mlynek received the link, he posted it to the AAPG Student Facebook page where followers were encouraged to vote for their favorite video with a "like" choice.

The members of the Student Chapter Committee then voted for their first, second and third choices. These votes were weighted, compiled with the popular vote and the end result was held onto until the annual meeting.

At the Student Reception in Long Beach, the Suez Canal University (video #6 on the AAPG YouTube channel in the AAPG Video Vault on the website) was announced as the first winner of the AAPG Student Chapter YouTube contest.

They were thrilled.

Not only did they win $400 for their chapter, they have set the standard for future participants.

"The Chapter's attention to detail was incredible, everything flowed together so well," Ball said. "After reviewing all videos submitted on the inaugural year of this competition, I can certainly say the bar has been set very high.

"I might add that they made amazing use of music and computer graphics," he said.

When asked what he might say to the Suez Canal students if he could speak to them face-to-face, Ball replied "The effort you put into assembling this video clearly paid off, in that your team was the first to ever win this award. You are clearly embodying the spirit of the AAPG by providing your student members with such great activities and teamwork."

3-2-1 Knock Out!

The program was such a success they will be doing it again for the 2013 ACE in Pittsburgh.

"The YouTube program is our newest program, and was designed by students who attend the Global Student Chapter Leadership Summit," Ball said. "It is just another example of how empowering students can help the AAPG."

Mlynek indicated they will be aggressively looking for sponsors for this program so they may offer a second and third place award. Currently, there is a first, second and third place award given to both U.S. and international student chapters based off the written reports.

The University of Indonesia and UNPAD (Padjadjaran) student chapters tied as seconds to Suez Canal's effort. Their videos may be seen on the AAPG YouTube channel: UI is video #8; UNPAD is video #5.

Bring it!

"I'd like to remind all chapters that this contest provides an easy way to amplify the work your chapter has already completed," Ball said. "I suggest EVERY student chapter designates/elects a videographer and gets involved in the competition.

"Next year, the competition is going to be bigger and better – so get ready to bring your A-game."

To view all videos submitted in this contest, go to the AAPG YouTube channel. The link is found at www.aapg.org/stayconnected.

Good browsing!

The AAPG and the AAPG IBA Committee would like to thank all of the sponsors that helped support the 2012 AAPG IBA Global finals and the 2012 AAPG IBA Region and Section semi-final programs.

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Saudi Aramco, Saudi Geophysical, Saudi Makamin Oil & Gas Services, South Rub Al-Khali Company Limited, Total

AAPG SECTIONS

Eastern:

Avary Geoscience, Billman Geologic Consultants, Inc. Chesapeake Energy Corp Hayward Natural Resources, Inc., Pittsburgh Association of Petroleum Geologists, Range Resources

Gulf Coast:

Badger Oil Corporation, Bennett System, Ltd., BP, Diversified Well Logging, Inc., ExxonMobil, Gulf Coast Association of Geological Societies, Houston Geological Society, McMoRan Oil & Gas LLC, New Orleans Geological Society Memorial Foundation, Inc., PetroQuest Energy, LLC, Plains E&P, Suemaur Exploration & Production

Mid-Continent:

Chesapeake Energy Corp, Marathon

Pacific:

Aera, Chesapeake Energy Corp, Chevron, Occidental Oil and Gas

Rocky Mountain:

Chesapeake Energy Corp, Newfield, Rocky Mountain Association of Petroleum Geologists Foundation, Rocky Mountain Section, Venoco Inc.

Southwest:

Southwest Section

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

PROTRACKS

Inaugural short course

Career Tips Shared At PROWESS Workshop

By JESSICA MOORE


MOORE

A new short course addressing career development and leadership in the energy industry premiered at the AAPG Annual Convention and Exhibition in Long Beach, Calif.

"Unconventional Work Force Assets: Developing Women Leaders in the Energy Industry" was offered by AAPG's Professional Women in the Earth Sciences (PROWESS) and the Association for Women Geoscientists.

The course provided high-profile, professional advice to younger professionals who are seeking to land leadership positions in the industry, and to match skill sets and career goals.

The program featured luncheon keynote speaker Marcia McNutt, director of the U.S. Geological Survey and adviser to the U.S. Secretary of the Interior, who stressed the importance of STEM jobs in providing meaningful and financially rewarding jobs for women, plus two sessions:

▸ The morning session, "Green Field Development," focused on getting started on the right foot and jump-starting a career at any stage, as well as recognizing technical and managerial career paths and the importance of personal decisions. The session's keynote speaker was Julie Mahler, senior commercial adviser and former global geoscience recruiting manager for ExxonMobil Upstream Ventures.

Issues addressed included:

✓ Maximizing the value of your technical skills: navigating the technical learning curve through training and experience.

✓ Perfecting your professional image: developing a corporate brand and not just a label.

✓ Developing leadership skills and influence without authority.

▸ The afternoon session, "Enhanced Opportunity Recovery," focused on maximizing personal experiences for career success via technical and managerial leadership techniques. The keynote speaker was Marcia McNutt, director of the U.S. Geological Survey and adviser to the U.S. Secretary of the Interior.

Issues addressed included:

✓ Expectations of tomorrow's leaders: skills needed to effectively lead future employees.

✓ The business of "The Business": information on economics and energy policy affecting your career.

✓ Second career, second success: tips for maintaining a dynamic geosciences career.

Some of the course's helpful pointers as identified by the participants included:

▸ You can have it all – but just not all at once.

▸ The difference between a "leader" and a "manager" – a leader creates the vision, while a manager organizes the process to achieve the vision, knowing who the right people are for the job.

▸ The importance of establishing yourself early on in a meeting. If you don't articulate early on, you may not say much the rest of the time.

▸ Not all leadership styles are the same; "quiet thought leadership" can be potentially more powerful than an overbearing leader.

▸ Build a network of people who can help mentor you for specific responsibilities.

▸ "Know your number!" Assess how much you are worth in order to attain the recognition and financial value you deserve.

Other helpful tips on how to establish your technical credibility included making regular rounds to individuals on your floor to understand personally what they are working on; if you take a course you like, teach it; learn at least one new technology and technical concept at conferences and write a trip report to establish why you went and the consequent value you will add to the company; make an asserted effort to attend as many technical talks and programs offered by your company as possible – be a sponge and never stop learning!

The participants' feedback was overwhelmingly positive, and this inaugural short course was deemed a great success.

In fact, requests already have been made to have the one-day course taught annually at subsequent AAPG annual conventional and international conferences, so stay tuned! E

IN MEMORY

Willis Howard Alderman, 88
Wheat Ridge, Colo., Nov. 26, 2011
Richard Stewart Ballantyne, 97
Pasadena, Calif., Oct. 31, 2011
Gerald Leverne Bell, 92
Jackson, Mich., Oct. 13, 2011
Richard Walter Benner, 89
Lakewood, Colo., March 1, 2012
Steven James Bergath, 62
Huffman, Texas, April 9, 2012
Alan Cecil Cook, 58
Keiraville, Australia, Nov. 17, 2011
Kent Charles Cregg, 85
Houston, March 18, 2012
John Bettes Dunlap Jr., 79
Harahan, La., Jan. 27, 2012
Peter Joseph Farrelly, 80
Centennial, Colo., Nov. 22, 2011
Gilbert Gaines, 83
Solvang, Calif., Sept. 22, 2010
Craig Eugene Gunter, 77
Denver, Feb. 19, 2012
Jimmie Calvin Herrington, 88
San Antonio, March 8, 2012
Donald Everhart Johnson, 84
Hurst, Texas, Dec. 17, 2011
Marvin A. Keller, 79
Casper, Wyo., July 16, 2011
Jack W. Latham, 82
Fairview, Texas, April 9, 2012
Russell H. Lyons Jr., 71
Edmond, Okla., Jan. 1, 2012
Steven James O'Conner, 60
New Plymouth, New Zealand
April 3, 2012
Oscar L. Paulson, 81
Vancleave, Miss., Feb. 17, 2012
Arthur Karl Petraske, 60
Evergreen, Colo., March 14, 2012
William Seaborn Richardson, 89
Duncan, Okla., Dec. 25, 2011
Dennis F. Smith, 88
Stillwater, Okla., Oct. 19, 2011
Alfred Wagner Jr., 83
Houston, Sept. 25, 2011
Joseph Key Wetherill, 94
Edmond, Okla., April 2, 2012
Louis Aubrey Williams, 67
Georgetown, Texas, Feb. 10, 2012

(Editor's note: "In Memory" listings are based on information received from the AAPG membership department.)

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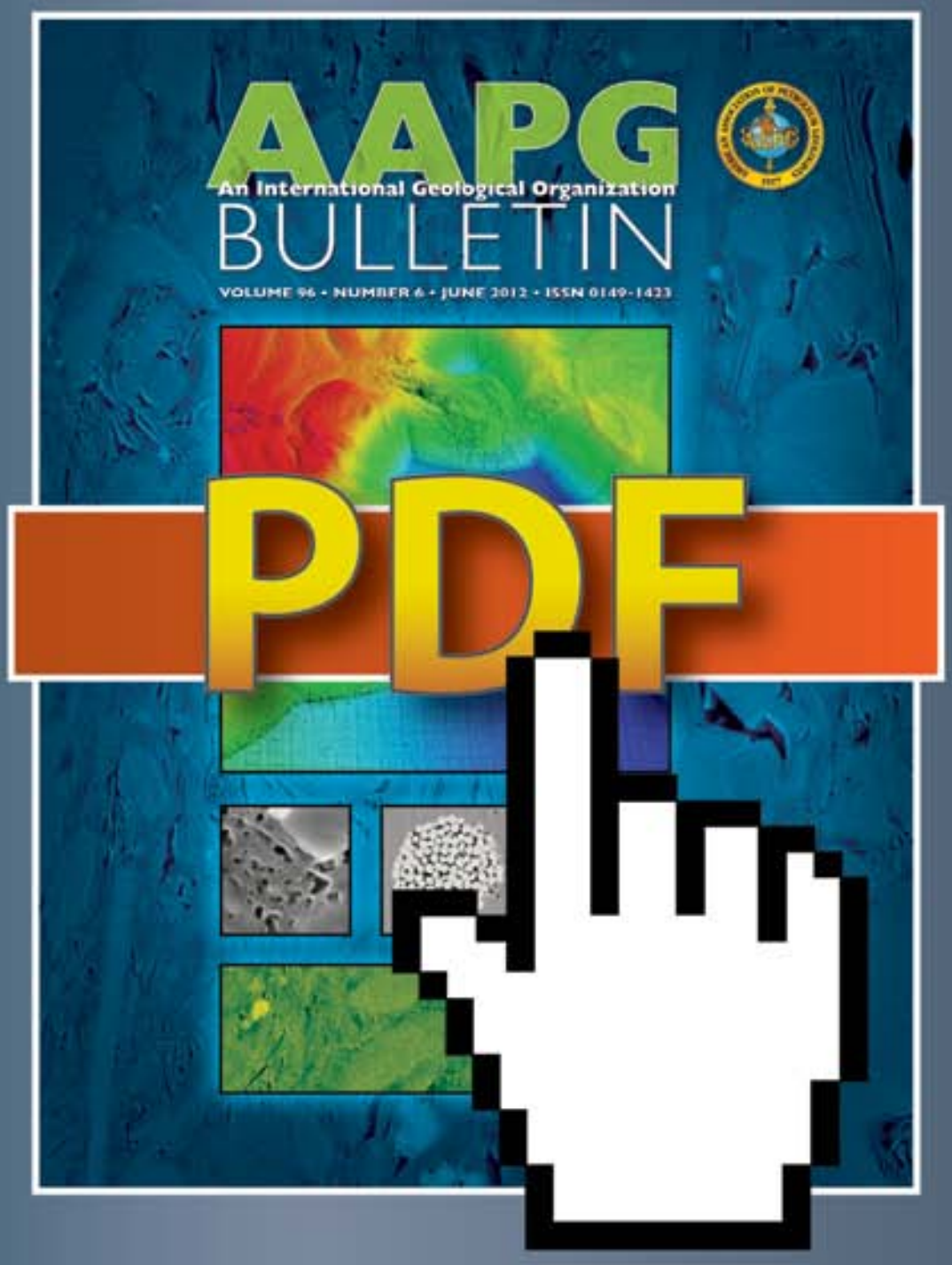

The AAPG Bulletin is a technical journal that is recognized in the industry as the leading peer-reviewed publication for information on geoscience and the associated technology of the energy industry.

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/june_bulletin

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

Article highlights include:

Predicting petroleum propensity

Suzanne E. Beglinger, Maarten P. Corver, Harry Doust, Sierd Cloetingh, and Allison Kennedy Thurmond

This study presents an application of a new method in which petroleum system and play development are related to basin cycle evolution. Basins with a similar tectonostratigraphic basin evolution are compared to predict the types of petroleum systems and plays that might be present.migration.

A new model proposed

Solange Angulo and Luis A. Buatois

A new depositional and sequence-stratigraphic model is proposed for the middle member of the Bakken formation, southeastern Saskatchewan. The member formed in an offshore to shoreface environment during a normal regression followed by a transgressive brackish-water restricted embayment.

Salt canopy dynamics and evolution

Tim P. Dooley, Michael R. Hudec, and Martin P.A. Jackson

An allosuture separates two coalesced salt sheets, and an autosuture separates two lobes from a single salt sheet. This paper describes systematically how these sutures form and evolve and how this knowledge clarifies the history of salt-canopy systems on a regional scale.

Pore types in mudrock

Robert G. Loucks, Robert M. Reed, Stephen C. Ruppel, and Ursula Hammes

Mudrock contains mineral-matrix interparticle pores, mineral matrix intraparticle pores, and intraparticle organic matter pores. Interparticle pores are more likely to be connected. During compaction, many of the pores are destroyed, decreasing the pore volume by as much as 88%.

Letters to the editor should include your name and address and should be mailed to Readers' Forum, c/o AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101, or fax (918) 560-2636; or e-mail to forum@aapg.org. Letters may be edited or held due to space restrictions.

READERS' FORUM

Action Demanded

Regarding "The Value of Exploration" (Director's Corner, May EXPLORER): At the rate of withdrawal of public lands from the potentially explorable lands in the western United States, the upcoming geologists will be lucky to do anything more than exploitation of existing fields.

And AAPG has said and done NOTHING while this has happened on our watch. We should hang our heads in shame!

Logan MacMillan
Littleton, Colo.

KO the 'K'

Regarding "Oh, Fraque! Changing Public Perceptions" (EMD column, May EXPLORER): Thanks to Stephen Testa for bringing this to the forefront of the organization's awareness.

Those of us in the exploration and development side of the oil and gas business are engaged in a war – whether we like it or not, or if we even realize it or not! The war is for the hearts and minds of the American people. Everyday, more assertions from the radical environmentalists are thrown at our industry, as you subtly allude to. Most are based on bad or junk science, through a campaign of misinformation, propaganda and lies.

I understand how someone of your elevated position within the geoscience community must look at this and say it's "no big fraKing deal"! Ha, Ha! Or it's completely trivial how the other side, when presenting the issue, in nearly every piece of media released to the public uses the "K" in fraccing.

I believe that it is a big deal and the sooner it's addressed by our industry to get unified behind never using that spelling ("fracking") in a press release or any other sort of informative document that will be viewed and read by the public, the better off we will be …

The prosperity that our profession and the oil and gas industry currently enjoys is a godsend after the last 26 years, and much of it is due to use of this technique (hydraulic fracturing). If the proper energy policy had been in place to take advantage of our burgeoning gas reserves, say three to four years ago, we all know things would be completely different with this recessionary economy that we have now. The entire country would be enjoying the benefits of our investment, labor and knowledge!

It's such a shame. What we don't need are more and more regulations and rules implemented by unelected bureaucrats influenced by negative, dogmatic, simplistic, sloganeering extremists that are designed to put a chokehold on the fossil fuel sector of the energy industry!

I applaud your decision to be fine with dropping the "K," and I would only hope that someone of your stature within the AAPG/EMD/DEG community would take this on to propose universal acceptance, considering the crisis that we currently find ourselves in.

J.B. Young
Midland, Texas

Permits Are Needed

Regarding the April Washington Watch (Hydraulic Fracturing Spawns New Regs): On the article's accompanying chart you show that "no liner is required in Texas for the storage of flowback water unless the RRC requires it."

Actually, H-11 permits, which do require liners, are required to store any frac flowback water. Trust me, there are no exceptions to this permit – or we would not be doing H-11 permits.

Michael Jacobs
Midland, Texas

(Editor's note: Jacobs is environmental manager for Pioneer Natural Resources and a past president of the Division of Environmental Geosciences.)

IBA Winners

from page 42

access to data for theses through them."

As to the presentation itself, the team prepared a proposal on a 5,000-square-mile tract of land inside Alaska's North Slope and was charged with convincing a team of experts why three areas within that tract would be the best places to drill for oil.

"We knew we had a good presentation," Lock said of this, the school's third trip to finals – even if, he admits, "you never know how things will pan out until the judges render their verdicts."

A Night to Remember

Last fall, Lock, who teaches subsurface geology, sedimentary petrology, stratigraphy and carbonate petrology, invited five students to be on the team.

"When I invite a student, I emphasize the amount of work that will be involved (typically eight-hour days or more every day for the full two months, often well into the night), so they come in with their eyes open," he said. "Twice I have taken someone off the team if the work ethic is not there."

Two month's prior to Gulf Coast competition the North Slope data set was provided. In preparation, the students put the pieces together and the first dry-run presentation took place at the end of that month; the second month was spent refining, tweaking and perfecting the presentation and preparing for the possible judges questions. This prep included mock presentations to representatives from Lafayette's oil community.

"The presentation has to be limited to 25 minutes," he said, "with each of the five team members taking about five minutes. A ten-minute Q and A session follows.

"As anticipated, the students grew enormously as petroleum geologists through the competition. They learned a lot about the industry and how it functions and also were impressive as team members, no prima donnas," Lock said. "Some 500 students participated worldwide this year in the competition and I think AAPG can be proud of how well the IBA has impacted the new generation."

The night in Long Beach, though is something that will stay with him.

"It was heady stuff," Lock said. "We were hoping to win, knew we were in with a good chance, but the actual announcement was still a highly emotional moment. A number of our alumni were there and the high-fives and hugs were simply amazing. I couldn't speak for several minutes. Like the students, I was very moved by the experience.

"After three trips to the finals, we finally made it."

UL alumna and AAPG member Mary Broussard observed the students "learned much about themselves during the process, and not only grew as petroleum geologists but also learned to work as a team, how to speak about geology in their own personal way. Petroleum geology has a language of its own; this team immersed themselves in it."

Lock says learning that language is a matter of doing what comes natural.

"If you want to be a geologist," he said, "you had better spend some time looking at rocks!"

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DIRECTOR'S CORNER

IBA a Microcosm of Values of AAPG

By DAVID K. CURTISS, AAPG Executive Director

The AAPG Annual Convention and Exhibition in Long Beach is all wrapped up. And what a great meeting it was!

Special thanks and congratulations to all of the volunteers and the entire AAPG staff who worked so hard to organize the conference – from the quality technical program, short courses and field trips, to the many committee meetings. A lot of work got done thanks to your efforts.

One particular highlight for me was the IBA competition, and particularly the awards ceremony. Congratulations to the 2012 IBA team winners from the University of Louisiana-Lafayette! (See related story on page 42). And to the second and third place finishers: Khon Kaen University of Thailand and the Colorado School of Mines, respectively.

* * *

Much has been written and said about the IBA program and its tremendous growth over the past years under the guidance of outgoing chair Steve Veal and the IBA Committee. It is now one of AAPG's biggest and most prominent programs with a global profile and global impact. But I'll confess that I didn't really get it until this past March when I had a chance to attend the European Region IBA finals in Prague.

Twenty student teams from across Europe arrived in Prague to compete. Each team had received a dataset from somewhere in the world, and over the course of six weeks were charged with developing their best prospects, and then presenting them to a panel of judges.


CURTISS

> I looked out at a crowd of bright, talented and energetic young people – like their counterparts in other Regions and Sections – eager to make their way in the world, to make their mark.

The students took this competition seriously. They were representing themselves, their schools and their countries. And the stories confirmed it: nights and weekends at the office, cots set up for a quick nap between interpretation sessions, and hours of practice on their presentation since many teams were not presenting in their mother tongue.

I witnessed their determination first hand: College students in Prague – Prague! – ordering tea after dinner and heading back to their rooms to practice their talks one more time. And you could see the focus in their eyes as they stood outside the presentation room, awaiting their appointed time in front of the judges. This was a big deal.

It occurred to me during the competition that what the students were experiencing in the IBA program was a microcosm of what drives the entire Association:

- **Science** – The focus of the IBA program is science and creativity. Developing plays and prospects and then presenting and defending those ideas to a group of decision-makers is what our profession is all about.

It's no wonder we're receiving anecdotal evidence that student job applicants with IBA program experience are attracting the attention of prospective employers.

- **Volunteerism** – Twenty teams competed in Prague, and the judges listened to and evaluated each and every presentation. They then ranked each team to determine the final three teams from Europe. This was a group of talented, seasoned professionals who gave several days of their lives to this endeavor.

I urged the students to think about that. These professionals flew in from across Europe, forgoing time with family and friends, to listen to them present. It's pretty remarkable when you think about it, and they were glad to do it. The judges were modeling for these students what it means to be part of a profession – and the importance of giving back.

- **Learning and networking** – Winning is fun, but it isn't the most important factor in the IBA program. Each one of the teams had a significant educational experience. And some of the teams recognized it, telling me that they knew they didn't have the experience of some of the other teams but they were there to learn. And they fully intended to take what they learned back to their schools to better equip next year's team.

And each student began the process of forming the business and personal friendships that characterize our profession and span the globe. I fully expect these students will enter our Young Professionals program as they begin their careers and to see them at AAPG events around the world.

* * *

During my remarks at the awards ceremony in Prague, I looked out at a crowd of bright, talented and energetic young people – like their counterparts in other Regions and Sections – eager to make their way in the world, to make their mark.

I was looking at the future of AAPG. A future that looks very promising.

David K. Curtiss

DIVISIONS REPORT

Fracturing Workshop Draws 340 Attendees

By BRUCE D. SMITH

Through a memorandum of understanding with the Environmental and Engineering Geophysical Society that was established in 2010, AAPG's Division of Environmental Geosciences co-sponsored a one-day workshop on hydraulic fracturing at the recent Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) in Tucson, Ariz. in March.

The workshop, titled "Hydrofracturing 101: What Is It, What Are the Issues and How Can Geophysics Help?" was convened by Michael Jacobs and Charles "Chip" Groat (both past DEG presidents), Bruce Smith (past DEG Environmental Geophysics Committee chair) and Jeff Paine (past DEG vice president and current Environmental Geophysics Committee chair).

The SAGEEP meeting had 340 attendees from 21 countries with four concurrent daily sessions, consisting of 210 oral presentations and 31 posters. Technical sessions brought together members of the near-surface geophysics community from academia, government and industry. Details of the sessions can be found on the EEGS website, www.eegs.org/AnnualMeetingSAGEEP/SAGEEP2021.aspx. Joint technical sessions were held with the AGU Near Surface Focus group and the SEG Near Surface Section.

A workshop handout – available in downloadable format on the DEG and EEGS websites (http://deg.aapg.org/Events/PastEvents.aspx and http://www.eegs.org/AnnualMeetingSAGEEP/SAGEEP2012/ShortCoursesWorkshops.aspx), summarizes the workshop and includes abstracts for most of the presentations.


SMITH

> Bridges are being built in this way to best serve the AAPG membership through making opportunities available for continuing education.

In addition, as part of cooperation between DEG and EEGS, peer-reviewed papers for joint special issues of DEG's journal *Environmental Geosciences* and EEGS' *Journal of Environmental and Engineering Geophysics* are being solicited from among the workshop presenters for publication in early to mid-2013.

These will be two separate journal issues with the workshop theme in common, to be published in the same month.

* * *

This workshop was part of DEG's ongoing efforts to have joint meetings and other events with other technical societies that have overlaps in interest in environmental aspects of the energy industry. Bridges are being built in this way to best serve the AAPG membership through making opportunities available for continuing education in areas that otherwise normally may not be easily open to or noticed by AAPG and DEG members.

The workshop generated significant interest from geophysicists, oil industry representatives, and governmental/regulatory agencies, with attendance reaching more than 40. There were 16 presentations on topics that included:

- The hydraulic fracturing process itself.
- Geophysical monitoring of hydraulic fracturing.
- Economic and environmental issues related to hydraulic fracturing.
- Regulatory issues related to perceived threats to infrastructure, groundwater and groundwater availability.
- New approaches to monitoring and assessing possible near-surface impacts of hydraulic fracturing.

This workshop topically also serves as a lead-in to the upcoming Geoscience Technology Workshop on hydraulic fracturing that will be held in Golden, Colo. on Aug. 13-15 (http://www.aapg.org/gtw/golden2012/index.cfm).

* * *

DEG is planning new collaborative activities at SAGEEP 2013, which will be held in Denver, March 18-21. Suggestions for program contributions can be sent to Bruce Smith (bsmith@usgs), technical program chair for the meeting.

(Editor's note: Smith is a DEG member and is with the Crustal Geophysics and Geochemistry Science Center of the U.S. Geological Survey in Denver.)