



AAPG

EXPLORER

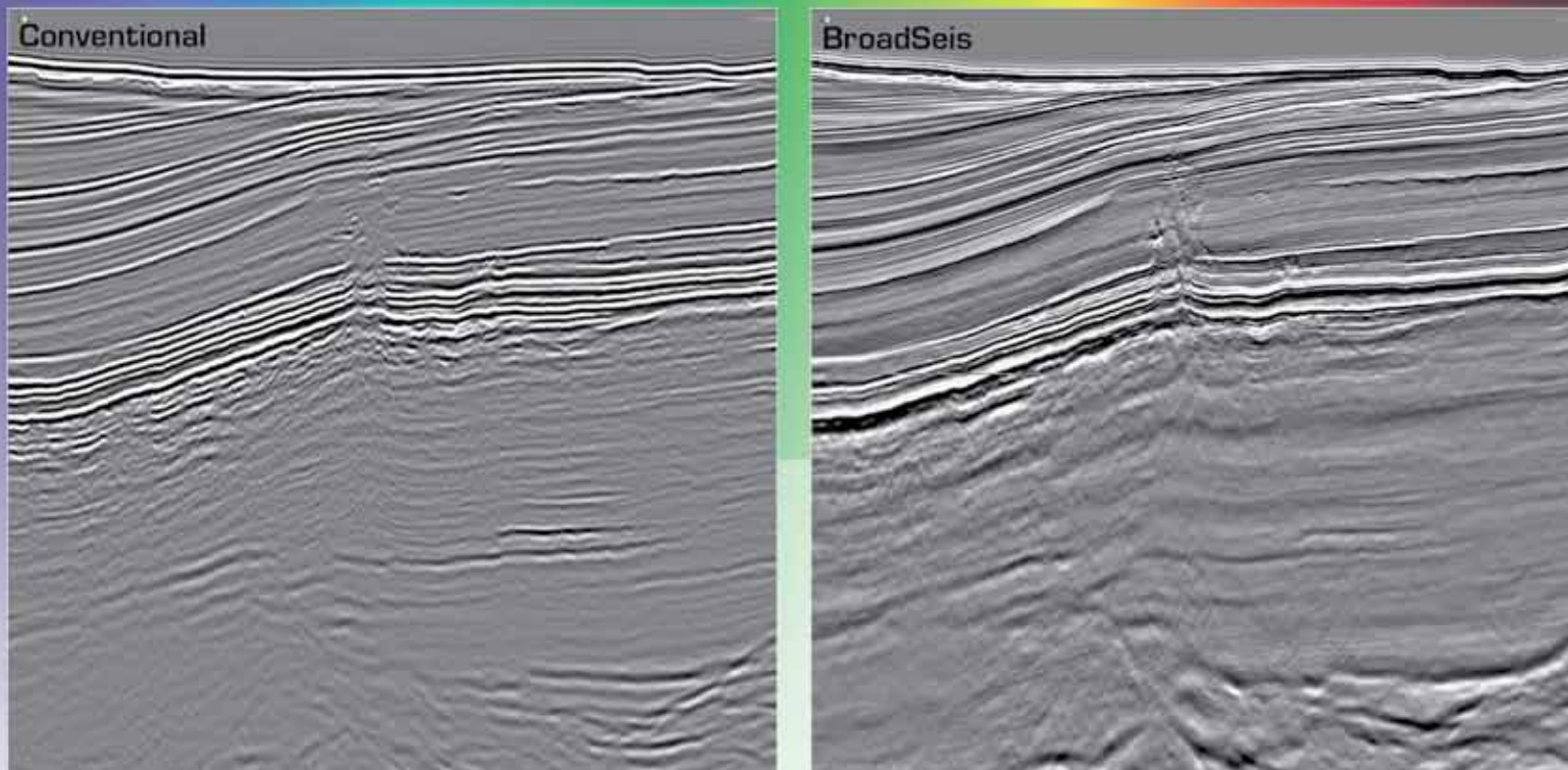
MAY 2011

A Trip to Wonderland ICE setting is near a geologic playground

See page 3

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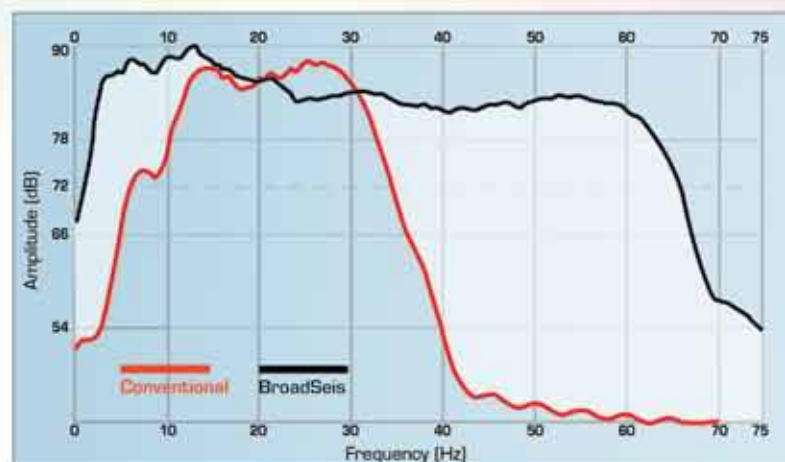
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PRESIDENT'S COLUMN

We Are a Diverse Tribe

By DAVID G. RENSINK

One of the many enjoyable parts of the job as president of AAPG is to travel and to talk with the growing AAPG membership – particularly the students. It is always an eye-opening experience.

Geoscience students in London, Aberdeen, Bergen, Stavanger and Copenhagen already are predisposed to a career in petroleum geology – whereas, it seems that most geoscience students in the United States and parts of Europe view it as a career of last resort.

The prevailing myth is that we are a low tech and dirty industry.

There's no getting around that it takes heavy machinery to drill wells, but the petroleum industry is one of the most computer intensive industries in the world.

In a 2006 AGI work force study, the petroleum industry ranked fourth behind government, environment and academia as a desirable potential employer for master's candidates. Yet we (along with the environmental industry) are one of the two top employers of master's degree graduates. It is hard to resist the starting salaries the petroleum industry pays – and the cool toys.

In some respects, a workstation is a video game you get paid to operate. The difference is that a workstation is a tool used to add wealth – not kill time.

It also has become obvious that the Imperial Barrel Award competition has become one of our premier programs for outreach to students and to faculty.



RENSINK



AAPG President David Rensink delivers the address at the opening of this year's Annual Convention and Exhibition in Houston. Unofficial totals indicate more than 8,300 people attended the annual meeting, making it the largest AAPG gathering of the 21st century. A complete report will be included in the June EXPLORER.

The IBA:

► Provides a hands-on learning experience that class work cannot duplicate.

Students use industry seismic and

well data to analyze a basin and develop prospects. The competition comes from each team's presentation of their results to a panel of geoscientists who make their living in exploration and development.

The following was sent on behalf of the AAPG membership:

TO: Hironori Wasada, President
Kenichi Kawaguchi, Vice President
Nobuyuki Samizo, Vice President, The
Japanese Association for Petroleum
Technology

RE: AAPG's Expression of Condolences
and Support for the Citizens of Japan

At this time of great tragedy and loss from the recent earthquake and subsequent tsunami on March 11, on behalf of the American Association of Petroleum Geologists, we send our most sincere condolences to the people of

Japan and to our fellow scientists, the members of The Japanese Association for Petroleum Technology.

Throughout history, in times of great challenge, the Japanese people have demonstrated remarkable stoicism and resilience. In times of great loss, the citizens of Japan have proven their unwavering determination to regain ground and rebuild for a brighter future. These admirable qualities have enabled Japan's triumph over tragedy in the past. We hope and trust that at this time, through the perseverance of its people, Japan will once again rebuild.

David Rensink
President, AAPG

► Provides the students with an introduction to how we add value in this business – and it gives them something to set themselves apart from their peers in the eyes of future employers.

► Provide the professors at the respective schools with data sets that they can use to establish curricula to train future petroleum geologists.

It is nice to have a program that benefits AAPG, the students, the universities and the industry. (See related story, page 31)

* * *

My travels have not made me an expert on cultural differences, and I have grossly underestimated its impact on business relationships in the past. However, it seems cultural differences are less noticeable when you are with a group of petroleum geologists. We all seem to have a lot in common, regardless of where you are located.

We often think of ourselves as a family.

But let me leave you with this thought: Petroleum geologists constitute a tribe.

We have a common ancestry – we are predominantly products of geoscience departments.

We have shared experiences and culture – we all make a living in generally the same manner.

Our leadership is neither formalized nor permanent.

We look to other members of the tribe for support, and we speak a dialect that is not easily understood outside the tribe.

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



The UT-Austin team takes this year's IBA top prize. See story, page 31.

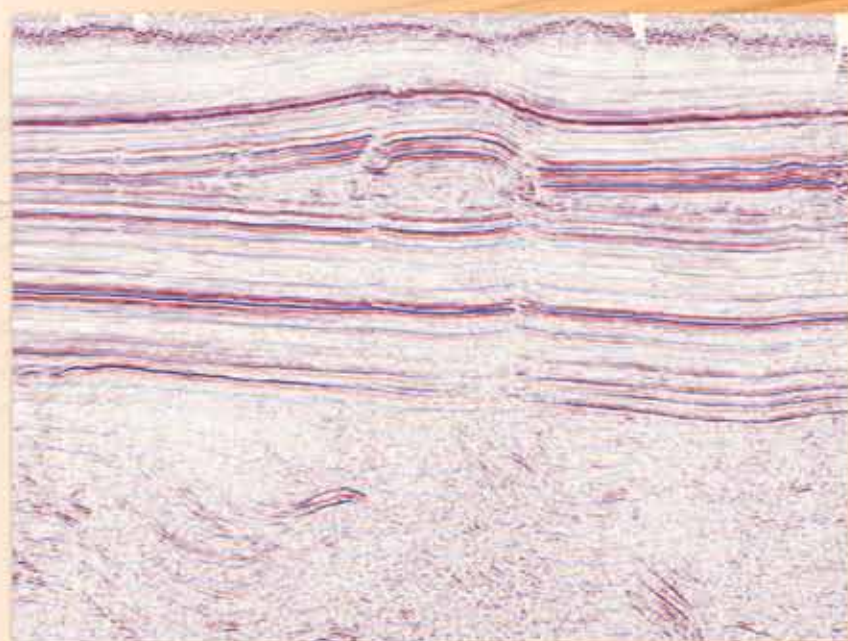
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ON THE COVER:

A field trip titled “Triassic Platform and Basinal Bodies of the Dolomites as Outcrop Analogs for Hydrocarbon Carbonate Systems” will be offered during the AAPG International Conference and Exhibition, which will be held Oct. 23-26 in Milan, Italy – and on that trip you'll visit this locale, which is found in northern Italy's Tofane area near Cortina, a town in the Dolomitic Alps. The official ICE announcement and technical program will be included with the June EXPLORER. Photo by Marco Stefani.

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Photos courtesy of Salvatore Mazzullo

Seeing is believing: Exposures on Highway 71 near Anderson, Mo., of the porous Pineville tripolite facies at the top of the Reeds Spring Formation (Osagean).



Field trip participants listening to the field trip leaders lecture at exposures of Kinderhookian limestones along Highway 71 north of Jane, Mo.

It's not 'just the Miss ...'

Mississippian a Symphony, Not a Solo

By DAVID BROWN, EXPLORER Correspondent

In the mid-continent Mississippi Lime, it's the same song and a totally new verse – with a challenging geological chorus.

Horizontal drilling has orchestrated a booming new oil and gas play in northern Oklahoma and southern Kansas, keyed to the presence of chert, tripolite, dolomite and vertical fractures.

Operators drilled oil wells in this area for decades, thousands of them, with hit-and-miss success.

Using a combination of horizontal drilling and hydraulic fracturing, they now bring in wells with hundreds of barrels of oil equivalent (Boe) production per day – and per-well estimated ultimate recovery up to 400,000 barrels.

And those wells can cost less than \$2.5 million each.

This new play is a tune of rocks and water.

First Notes of Understanding

For a heavily drilled area, the Mid-Continent Mississippian was surprisingly little understood – or even misunderstood.

AAPG member Salvatore Mazzullo, a professor of geology at Wichita State University and a three-time winner of the A.I. Levorsen Award, started a project in 2009 to study the Mississippian Cowley Formation.

"We could figure out the Cowley – we had cores, but we couldn't figure out where it fit in the Mississippian," Mazzullo said.

"So we went to the outcrop. The first day, we realized these rocks are exactly like the cores we see in the subsurface. Not just similar, but exactly alike," he said.

AAPG member Charles Wickstrom is managing member of Spyglass Energy Group in Tulsa, a player in the Mississippi Lime.

"You can take what we see in the outcrops in this tri-state area (of Missouri, Arkansas and Oklahoma) and just take it directly to the subsurface," he said.

The Tulsa Geological Society sponsored a three-day field trip to study the outcrops in April. Saying industry interest in the Mississippian runs high would be an understatement.

"We had the field trip planned for one bus with 43 people. It sold out within an hour of the announcement," Wickstrom said, which caused an expansion to accommodate more than 90 people.



MAZZULLO



WICKSTROM

In his studies, Mazzullo found that the accepted depositional model for the mid-continent Mississippian didn't match up with the reality he was seeing.

"We realized these units weren't doing what they were supposed to be doing in the model," he said.

For instance, the model says the Mississippian rocks deepen to the south, but they actually shallow to the south because of tectonic activity, he noted.

Recognition and understanding of the unconformities in the Mississippian are essential, Mazzullo said. Some are eustatic, some tectonic.

"If it's a tectonic unconformity and you're looking updip for a reservoir, it's not

going to be there" he said.

In Missouri, the Mississippian outcrops can be found to about 40 miles east of Springfield. They extend south past Harrison in Arkansas and to Tahlequah in Oklahoma, Mazzullo said.

From there the characteristic Mid-Continent Mississippian rocks, up to 400 feet in total thickness, extend 300 miles to the west.

"These rocks have been there for a long time, but people haven't been able to put it all together," Mazzullo said.

When he looks at the Mississippian rocks, "they're telling us, we've been looking at the wrong things," he noted.

"We've been looking at it in the wrong way."

Complex Structure

Starting with knowledge of the subsurface was key, according to Mazzullo. That allowed close analysis of the outcrops.

He identified three distinct formations in the Osagian Mississippian, with different members and characteristics: the Burlington-Keokuk, Reeds Spring

and Pierson.

The Pierson Formation contains reefs and has dolomite updip, presenting two reservoir objectives, Mazzullo said.

The Reeds Spring is a series of prograding wedges and has tripolite at the top, he noted. It also may contain multiple reservoir objectives. The Cowley is a facies of the Reeds Spring.

Care is needed because "it doesn't suffice to say 'Reeds Spring.' You have to identify which wedge," he observed.

"Our work on the outcrops has defined clear reservoir objectives within the Mississippian. It used to be you just drilled into the Mississippian," Mazzullo said.

"Everybody went under the mistaken impression, it's just the Miss. Well, it's not just the Miss.

"You need to know which particular reservoir section you're in. And you have to do sample work," he added.

Going Out

In a series of papers, Mazzullo and co-author and AAPG member Brian Wilhite have tried to refine the nomenclature used for the Mid-Continent Mississippian, right down to the types of rocks present.

They distinguish among:

► **Chert**, which is SiO₂, and readily identified by geologists.

► **Tripolite**, which is chert of any age that has been highly weathered by meteoric fluids, and is light-weight because of high microporosity formed during subaerial exposure.

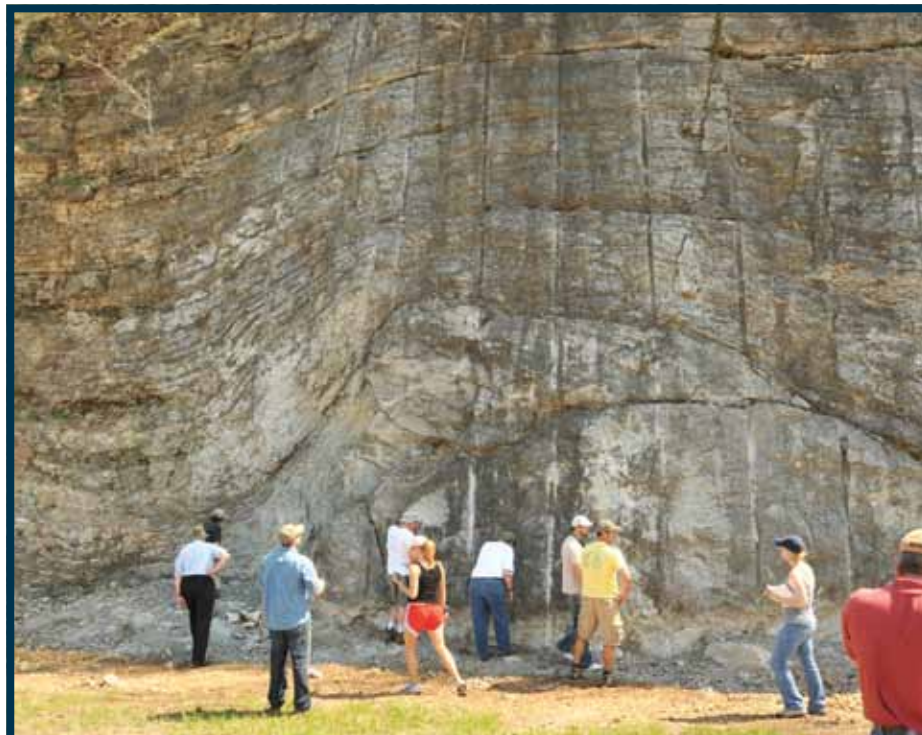
► **Spiculate**, which is fine-grained rock composed of the siliceous spicules of invertebrates.

► **Chat**, which, according to the authors, is an informal, local term that does not denote any specific lithology. They suggest it not be used.

(Some mid-continent operators, however, refer to the new play as the "Mississippi chat play" and identify tripolitic or weathered chert as chat.)

Defining and identifying these rocks has helped Mazzullo identify the characteristics of different Mississippian formations. The Reeds Springs contains very cherty limestones in which spicules have not yet been found.

Wickstrom said the Mississippian often



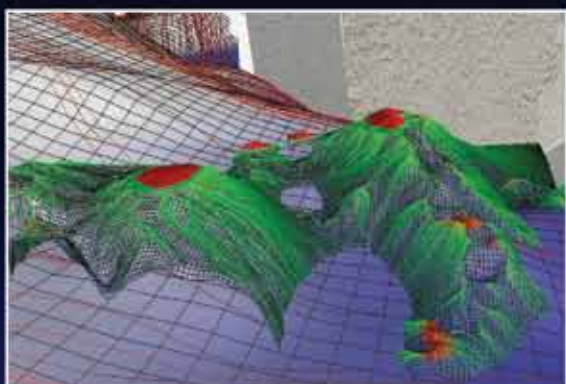
Field participants examining the exposed tip of an oil-stained, bryozoan-crinoid reef and capping crinoid grainstone facies in the basal Osagean Pierson Formation, east of Siloam Springs, Ark., on Highway 412 – exploration targets in the Kansas and Oklahoma subsurface.

See Miss Lime, page 10

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Upper Devonian Woodford Shale (base) overlain unconformably by Kinderhookian Compton Limestone (crinoid grainstones) with syndepositionally tectonically displaced bryozoan-crinoid reef (above and to the right of person). Compton reefs may be exploration objectives.

A new understanding after all these years Do You Know the Mississippian?

By DAVID BROWN, EXPLORER Correspondent

A new hydrocarbon play in Kansas and Oklahoma is drawing interest to possibilities in several Mississippian formations.

What should geologists look for in the subsurface Mississippian?

Three principal things at this point, according to AAPG member Sal Mazzullo of Wichita State University.

► First is the fractured but otherwise tight Osagean Reeds Spring cherty limestone reservoir that companies are treating with big frack jobs in northern Oklahoma to produce commercial quantities of oil.

► Second is the locally well-developed tripolite just below the unconformable top of

the Reeds Spring that has produced much hydrocarbon in giant fields such as Glick and Spivey-Grabs in south-central Kansas.

► Third is the Osagean Cowley spiculite reservoir, which has produced gas and a lesser amount of oil from several fields in southern and south-central Kansas.

The Cowley spiculite is a facies of the Reeds Spring Formation.

"Siliceous reservoirs within and at the top of the Reeds Spring, and within the Cowley spiculite, may have similar appearances on some logs," Mazzullo noted.

"They have simply been referred to in the past as 'Osage,'" he said. "Our studies have indicated that such simplicity is not warranted by Mississippian outcrop or subsurface lithostratigraphy."

Know Your Targets

Accordingly, the explorationist needs to know which unit is being exploited.

"These reservoirs have been produced for years. However, exploration indeed is still in its infancy, because there has been a fundamental misunderstanding of the geology – which in turn leaves a lot to be explored for by the astute geologist," said AAPG member Brian W. Wilhite, exploration geologist for Woolsey Operating Co. LLC in Wichita.



WILHITE

Mazzullo and Wilhite have studied the Mississippian with colleague Darwin Boardman, associate professor of event stratigraphy and paleontology at Oklahoma State University in Stillwater.

Their studies were initially stymied by lack of full core coverage, according to Wilhite. "Existing 30- and 60-foot cores were not cutting it in our work in understanding the reservoirs. We needed a point of context – a benchmark core where we could view all stratigraphic contacts," he recalled.

"This initial core, and numerous other full Mississippian cores since this time, along with cuttings work greatly expanded our understanding of the subsurface," he said.

Wilhite said Woolsey Operating began looking for production from the Cowley years ago.

After measuring over 100 outcrop locations, the researchers were able to establish a depositional framework for application to the subsurface.

"Since that time we have modified our understanding of reservoir units, recognized these systems and discrete objectives in both subsurface and seismic and furthered our exploration efforts," Wilhite said.

The stratigraphic architecture of the Reeds Spring and Cowley are composed internally of discrete, basinward progradational wedges, Mazzullo said.

Individual wedges within such packages may differ somewhat in their lithology – and therefore in reservoir potential.

"Distinguishing these lithologies is a very easy task if one has well cuttings samples or cores, as they are readily identifiable in such samples," Mazzullo observed.

"Point is, all three of these Osagean units are proven reservoirs in the subsurface, so they are viable exploration plays," he said.

"But one has to know which Osage is being hunted."

See **Geologic Data**, page 10

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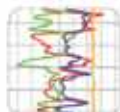
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Miss Lime from page 6

was logged without noting the distinctions among formations.

"Many well site geologists, when they got to the top of the Mississippian, may or may not have looked at the samples," he said.

Closely defining those characteristics has helped to identify reservoir objectives, even beyond the most frequently targeted zones.

Mazzullo said the lowermost, Kinderhookian part of the Mississippian includes the Compton-Northview sections. The Compton Lime contains reefs that are locally oil-stained and deserves more study, he noted.

In the area being developed by Spyglass Energy, a productive weathered chert layer of lower porosity exists under the target Reeds Spring zone, Wickstrom said. Horizontal drilling also can open up the potential of that type of secondary target.

"I see this eventually being drilled with multiple laterals in the Mississippian," he said.

Unconventional Approach

Shane Matson, Spyglass Energy geologist in Tulsa, said he began searching for possibilities in the Mississippian tripolite chert in 2003.

"We weren't paying too much attention to the other 250 feet of the formation, mostly because the logs were so confusing," he said.

A breakthrough came in 2009, when the company obtained its first image logs

in the formation, he recalled. Matson and Wickstrom were able to correlate what they saw with outcrops in the Ozarks, and now routinely run image logs on their wells.

This new Mississippian play has been called an application of horizontal drilling and fracking to a conventional reservoir. But Matson said he considers it an unconventional play because the geology is outside conventional boundaries.

"One of the challenges people have in this play is evaluating it on traditional neutron porosity logs. The porosity profile is complex," he said.

Even the operators drilling successful wells don't always understand the nature of the formations they're drilling, Matson noted.

"There are multiple facies people are exploiting and much of the time, probably, they don't know which facies they are exploiting," he said.


Wells in the Mississippian play typically produce a lot of water. And that's something operators don't mind in this play.

"The more water/fluids you're getting, the more oil you're producing," Wickstrom observed.

Coping with the water does take planning, and Wickstrom said a development project starts with drilling an injection well to the bottom of the Arbuckle. That can handle the water from up to eight development wells, he said.

Today, the long-time Mississippian play in Kansas and Oklahoma is back big time. Exploration that was hit-and-miss is now hit-and-produce.

"The fractures were vertical and it just depended on whether you were lucky enough to get in the fractures," Wickstrom said. "It's ideal for a horizontal play."

For Mid-Century players, that's music to their ears. 



Left to right: Field trip organizer Shane Matson and trip leaders Beau Morris, Brian Wilhite, Sal Mazzullo, Darwin Boardman and Robert Turner.

Geologic Data from page 8

Geologic Factors

Outcrop and subsurface studies indicate that syndepositional tectonism has played a major role in the development of unconformities and truncated folds within the Osagean section, and in the deposition of certain reservoir-associated lithofacies.

"Accordingly, one has to tie in lithostratigraphic and syndepositional tectonics in any exploration play for these rocks. Whether these plays are more prone to oil or gas in different areas has not been well established," Mazzullo said.

"It has been presumed, for example, that gas predominates east of the Nemaha Ridge, but I have identified several Cowley-Reeds Spring fields that produce


oil instead of gas in such areas. Much more data are needed in this regard, he added.

Mazzullo cited two additional plays that have emerged from outcrop studies and that will require evaluation of detailed stratigraphic correlation and subsurface sample studies ahead of drilling.

First are reefs in the Kinderhookian Compton Formation and the basal Osagean Pierson Formation, where deposition and diagenesis were strongly affected by eustasy as well as syndepositional tectonism.

Second is the up-dip pinchout of porous dolomites within the Pierson.

"We can no longer simply refer to the Mississippian section as 'Mississippi chat' or 'Mississippi Lime,'" Mazzullo said.

"Explorationists need to know which formation within the Mississippian they are going after, and what type of reservoir they are seeking." 

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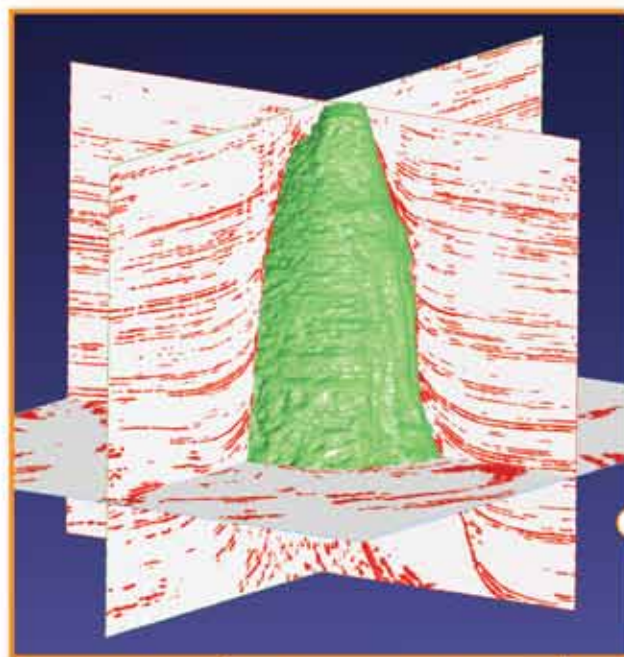
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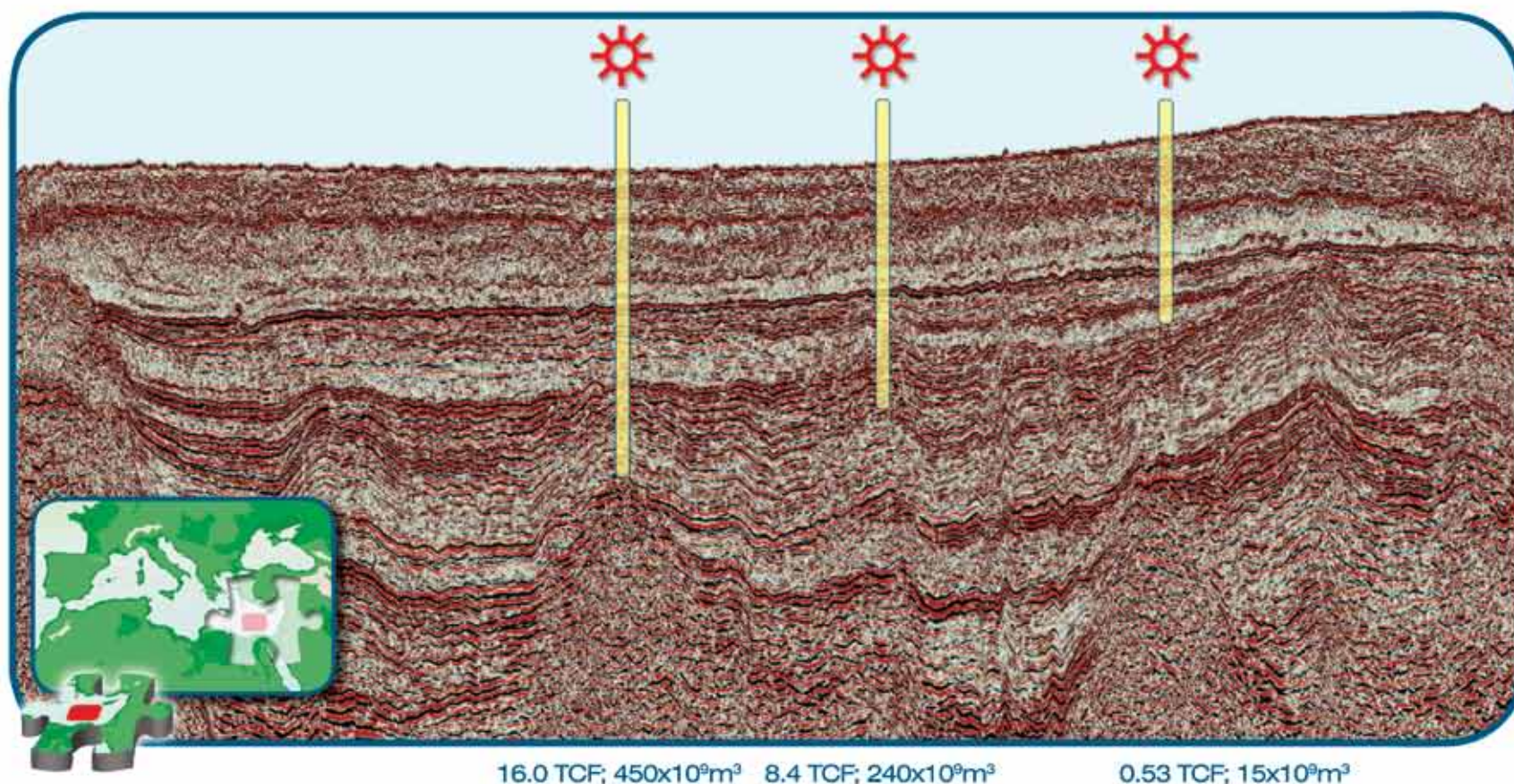
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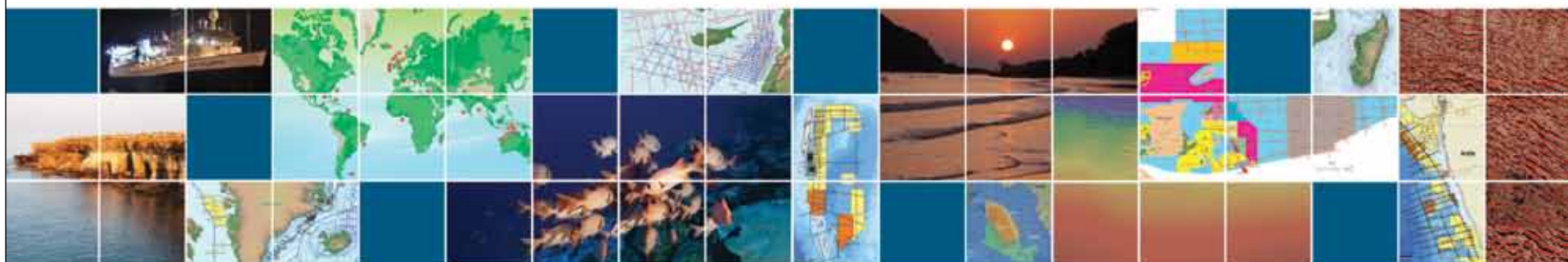


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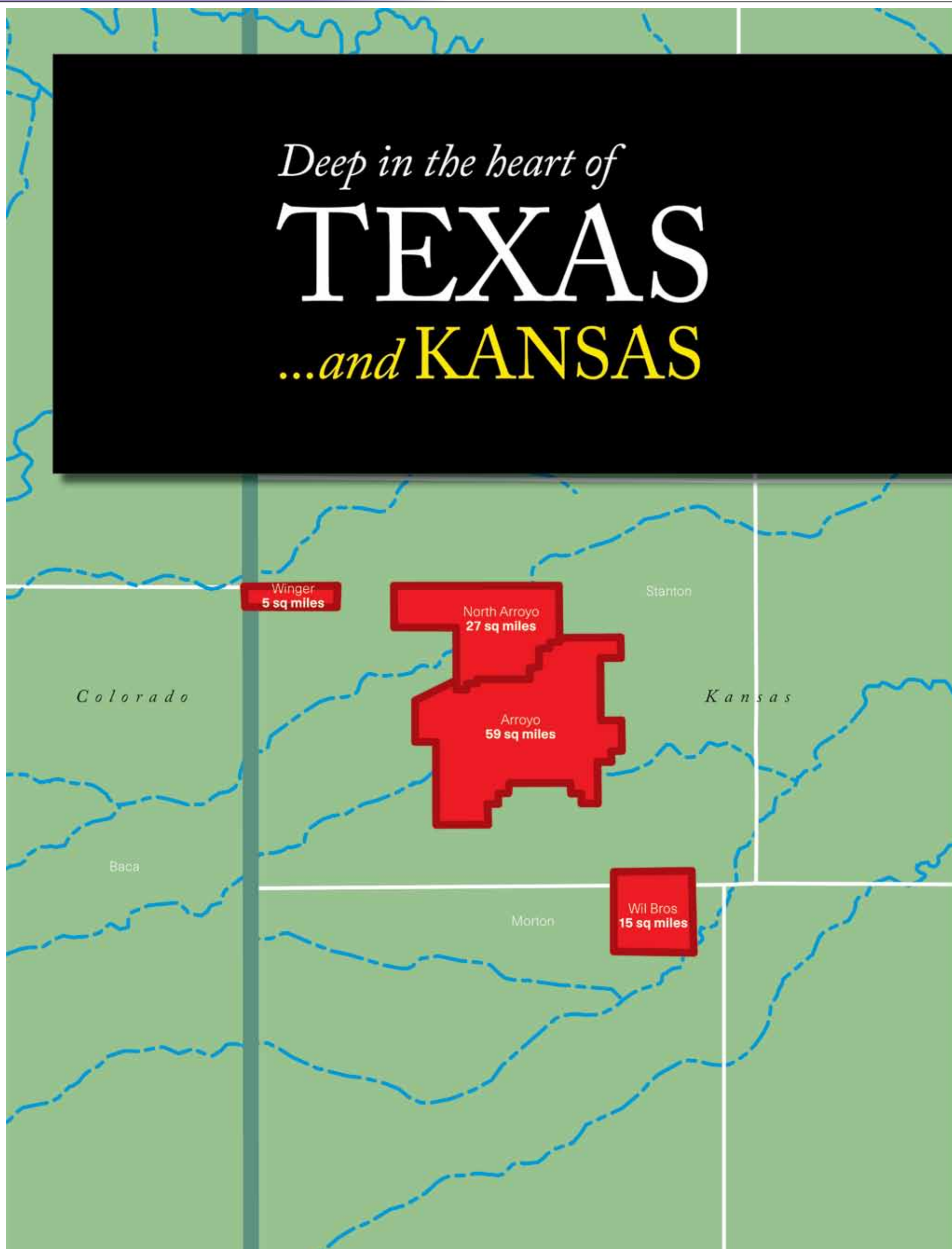


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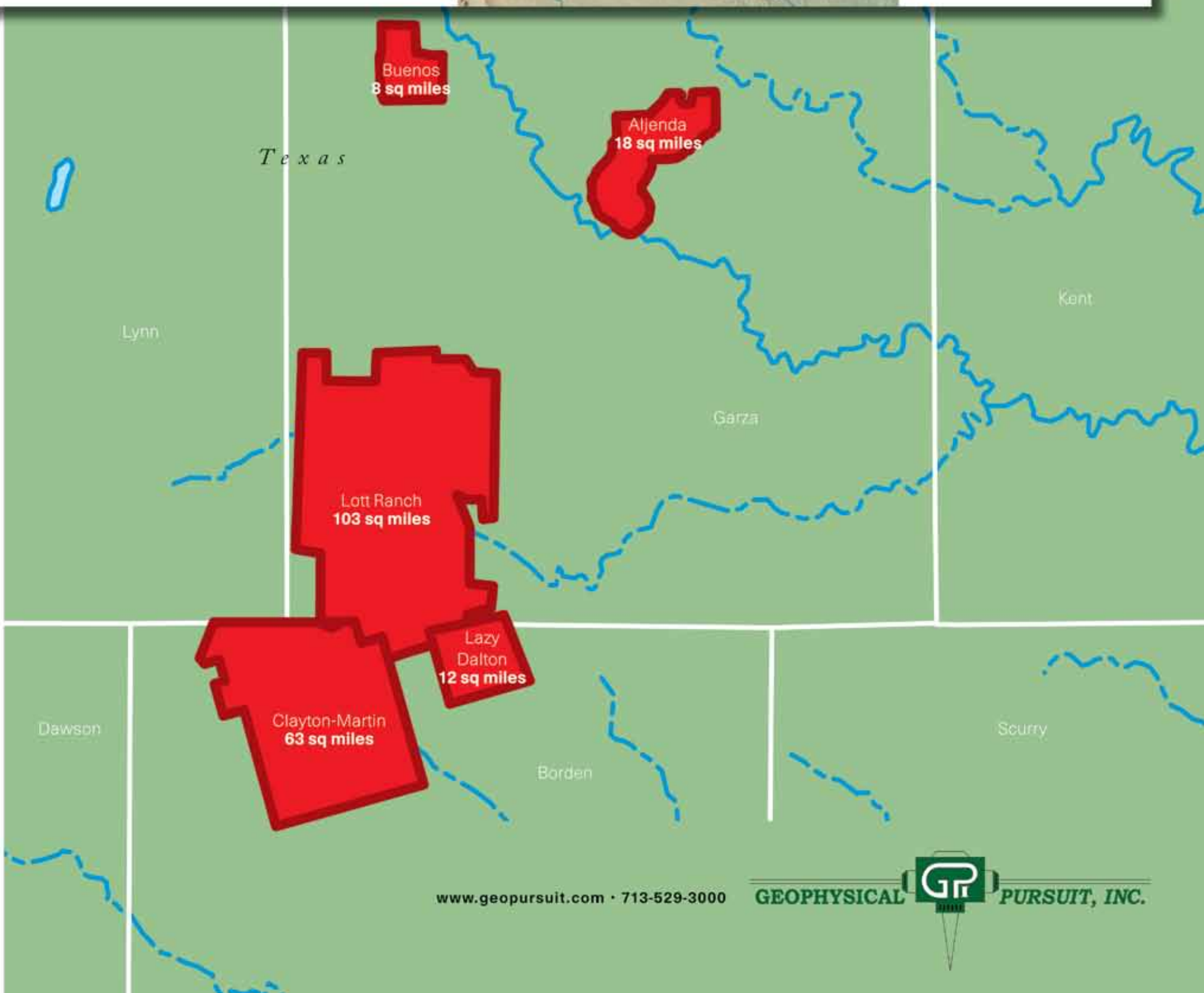
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Exploration approaches affected

Marcellus Core Areas Differentiated

By LOUISE S. DURHAM, EXPLORER Correspondent

The Middle Devonian Marcellus Shale has become one doozy of a gas play.

In fact, it's one of the premier shale gas plays of North America in terms of total gas resource, extent, production rates and economic potential, according to AAPG member Bill Zagorski, vice president of geology for the Southpointe, Pa., Marcellus shale division at Range Resources, which pioneered the play.

It all began in 2003 in Pennsylvania's Washington County, where Range was drilling the Renz #1 well. It encountered significant gas shows in the Marcellus while on the way to test deeper horizons, which didn't pan out.

In 2004, Zagorski had an "Aha!" moment and recommended a Barnett Shale-type frack treatment on the well, resulting in what was tagged as the first decent commercial discovery in the Marcellus.

The play soon began to pop.

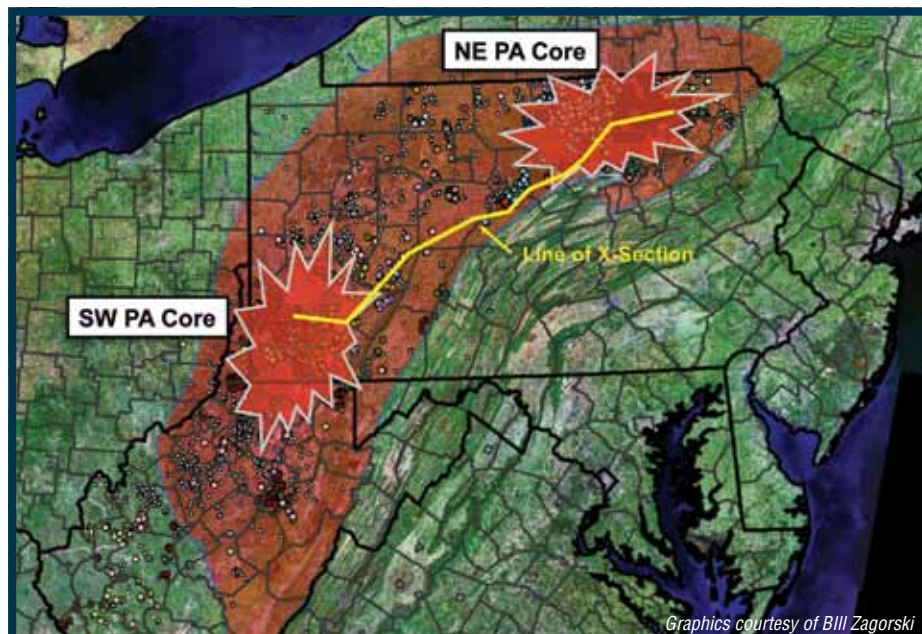
Zagorski's key role was acknowledged with fanfare in 2009, when he was officially given the title "Father of the Marcellus" by



ZAGORSKI



EMERY



The Marcellus Shale play core areas; the total play area is 44,030 square miles.

the Pittsburgh Association of Petroleum Geologists.

Zagorski and principal co-author Martin Emery prepared a paper "An Overview of Some Key Factors Controlling Well Productivity in Core Areas of the Appalachian Basin Marcellus Shale Play," that was presented at the recent AAPG Annual Convention and Exhibition in Houston.

A family illness kept Zagorski home for

the meeting, so Emery, vice president of geology for Range's Williamsport Marcellus shale division, had the honors of presenting.

The paper's other co-authors were Doug Bowman, senior geologist at Range's Southpointe, Pa., Marcellus shale division, and Greg Wrightstone, director of geology at Texas Keystone Inc. All are AAPG members.

"The organic rich shale of the Marcellus was deposited in a foreland basin setting

that allowed for accumulation and preservation of the organic material," Zagorski said.

"High organic content and the associated porosity and greater overpressure are some of the key Marcellus gas productivity factors."

Controlling Factors

Zagorski and Emery note two major core areas have developed in the 500-mile-long, southwest-northeast trending Marcellus Shale play fairway.

"One is the southwest Pennsylvania region, which was the original discovery area for Range," Zagorski said. "The other is the northeast core area in the northeastern part of the state."

Marcellus shale thickness ranges from about 100 feet average gross in southwestern Pennsylvania to more than 250 feet average gross thickness in north-central Pennsylvania.

"The productivity and geographic extent of the core areas are huge compared to other shale plays, and we're focusing on the best of the best right now," Zagorski noted. "But even non-core areas have great productivity."

"The two core areas display unique combinations of controlling geologic factors," Emery added.

To be simplistic, you can basically call

See Marcellus, page 16

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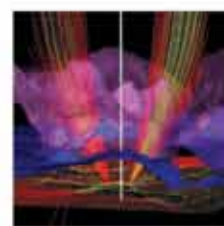
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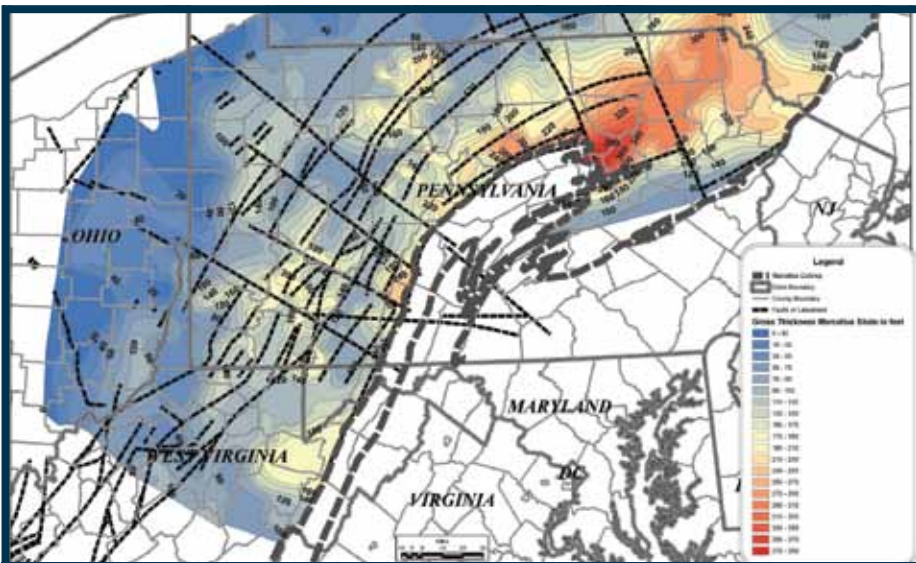
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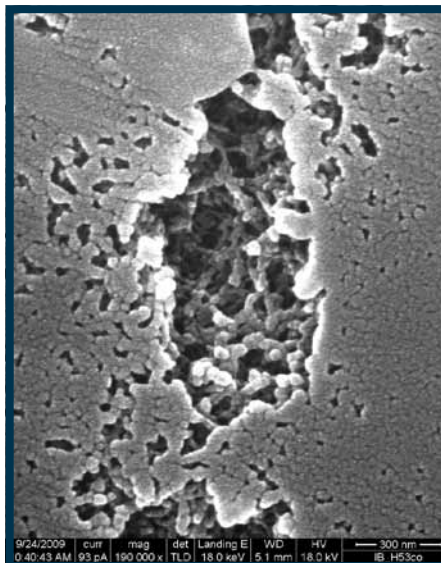
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Gross thickness of the Marcellus Shale ranges from over 150 feet to over 350 feet in the northeast part of the play, and from 50-200 feet in the southwest.



Marcellus intra-organic porosity, in a sample taken from southwest Pennsylvania.

Marcellus from page 14

the core areas a northeast dry gas play and a southwest combination NGL and dry gas play, Zagorski and Emery emphasized.

"There's one set of rules that describes the core area in the northeast," their paper states. "It has a different set of fairways, has different pressure gradients, formation thicknesses are quite different and have different fracturing characteristics.

"In the southwest," they note, "the play tends to be over-pressured and liquids rich, and in the northeast it tends to be more over-pressured but almost all dry gas for the most part."

Zagorski and Emery suggested there were differences in sedimentation rate in the two areas, so one is thicker but has less concentrated organics, and the other is thinner but more concentrated in terms of organics.

That makes a difference in porosity and permeability distributions of the two plays – and especially how it relates to the NGL plays.

Big Differences, Big Implications

In addition to other basinal faulting associated with the Rome Trough, there also are northwest-southeast trending basement faults that influence or disrupt all of the thermal maturity and depositional patterns that appear to have bearing on exploration approaches in each of the areas, according to Zagorski.

A type log of the southwest area where the shale is about 150 to 200 feet shows the Marcellus there tends to have very high gamma ray counts, high resistivities, high density, high porosity, Emery and Zagorski note:

"If we compare this with the same type log in the northeast we find the Marcellus is about 260 feet thick," they said, "and the intervals between the overlying Tully limestone and the base of the Marcellus are very great there but relatively small in the southwest."

They note that this has big implications in terms of fracture containment and fracture height growth, so these things must be considered when comparing the two areas.


"The southwest region tends to have a higher concentration of organics on a per foot basis," Zagorski said, "so it tends to have better preserved porosity and permeability, because most of the porosity and permeability are directly related to the presence or absence of total organic carbon (TOC)."

Intra-organic porosity is present throughout the whole Marcellus shale play, but there are differences in the type and distribution of it between the southwest and northeast core areas.

According to the two, the Marcellus is one of the strongest intra-organic particulate type plays compared to other shale plays.

"This is due to the concentration of TOC," they said. "The higher organic content facies of the Marcellus is the key reservoir rock in terms of hydrocarbon storage.

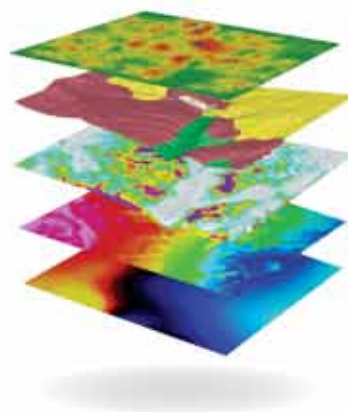
"In the northeast, while the section is thicker, it has lower volume TOCs compared to the southwest," Zagorski said. "But it has higher volume clay content and seems to have higher salt water saturation and lower porosities; but it's thicker and higher pressure gradient and is somewhat deeper.

"Surprisingly, the gas-in-place (GIP) numbers and productivity are similar in both core areas, Zagorski and Emery noted, "with the northeast showing the highest GIP values." 

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Plentiful supplies, distant markets

Shale Gas Affects LNG Economics

By LOUISE S. DURHAM, EXPLORER Correspondent

About 10 years ago there was major buzz and much hand wringing over predictions of big time natural gas shortages for the United States.

Investors at that time lined up to support companies that were working to acquire the needed permits to construct LNG import terminals to ensure future supplies of gas for the country.

Then the shale gas boom got under way, shortly before demand tanked in tandem with the economy.

So, here we sit with natural gas storage facilities brimful and gas prices so low they



GULEN

make you want to cry.

But don't cry for LNG. It hasn't gone away; it's just a different game now.

Some are talking about exporting LNG from the United States, but this is a tough proposition.

The EXPLORER talked to Gurcan Gulen, senior energy economist Center for Energy Economics at the Bureau of Economic

Geology, Jackson School of Geosciences at University of Texas, Austin, shortly before he presented a talk on the subject at the recent AAPG Annual Convention and Exhibition in Houston.

Gulen provided the skinny on LNG today.

Changing With the Times

GULEN: The nature of LNG trade has been changing in terms of, traditionally the industry depended on long-term contracts, usually at fixed prices or prices indexed to either crude oil or some combination of oil products.

The most famous is the Japanese crude cocktail. This is a combination of different crudes, and they have a formula they use to determine the price of LNG they import. The idea goes back a long time to when natural gas was much more of a direct substitute for oil products and the oil and gas price relationship was more stable than now. In a country like Japan energy security is of utmost priority, so they may be willing to pay a premium; there was a belief that if you use this formula, you will have secure supplies.

Another reason for long-term contracts is LNG investment. If you look at the value chain, it's an integrated project and very expensive. It's a lot of work from a project financing perspective, not to mention developing the resource itself upstream.

But we have observed the increasing share for spot cargoes in the late '90s and 2000s. This means there are cargoes out there that are not tied into long-term contracts or, if they are, the newer contracts have some flexibility clauses in them.

For example, if a buyer doesn't need a supply and the supplier has other markets, there's flexibility in a contract such that they can agree on a compensation scheme – or the supplier can send the cargo somewhere else. This also can work in reverse should the supplier find another customer and compensate the buyer.

How much of this is going on is debatable. People thought this would change the nature of the markets, but it hasn't done so to the extent some thought five to 10 years ago. It's still a very capital-intensive chain where you're building all those specialty ships and so on. You can't expose too much of that value to volatility in the marketplace. A part of the volatility comes from the domestic development of natural gas resources; the shale gas situation in the United States is one of the best examples.

Many Proposals, Few Facilities

GULEN: Ten years ago, when production was declining and prices going up, about 60 LNG projects were proposed. There was a lot of scary information all over the Internet about tankers, regasification facilities and such, and we ended up with a handful of terminals, mostly in the Gulf Coast, Mexico or Canada.

Because of increased production from shales and stable or even decreased demand, these terminals are mostly idle.

Some are talking about exporting LNG from the United States, but this is a tough proposition.

If you look at the global marketplace,



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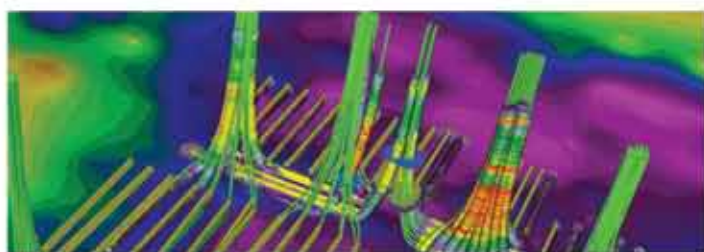
See **LNG**, page 20



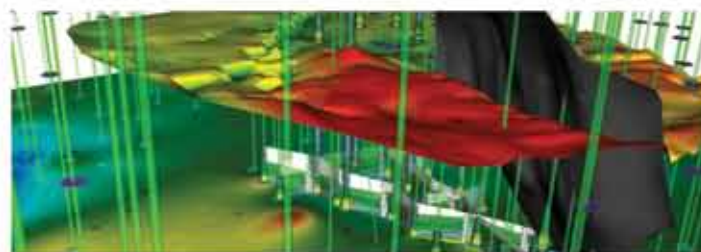
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Voting Deadline Arrives May 15

The balloting deadline arrives this month in voting for AAPG officer candidates for the 2011-12 term.

Online voting will be available through May 15 at 11:59 p.m. CDT.

While electronic balloting is available to all members a paper ballot also was sent – however, Survey and Ballot Systems' coded system allows only one ballot per person, with the paper ballot taking precedence if both are submitted.

Biographies and video comments by the candidates also continue to be available at www.aapg.org.

The president-elect will serve in that capacity for one year and will be AAPG president in 2012-13. The vice president-Regions and secretary serve two-year terms. Complete election campaign rules also

are available online. The slate is:

President-Elect

- Edward A. "Ted" Beaumont, independent consultant, Tulsa.
- John C. Dolson, DSP Geosciences and Associates, Coconut Grove, Fla.

Vice President-Regions

- David C. Blanchard, El Paso Egypt Production, Lasilkly, Maadi, Egypt,
- Stuart D. Harker, Circle Oil Plc, Finchampstead, U.K.

Secretary

- Charles A. "Chuck" Caghey, ConocoPhillips, Houston.
- Denise M. Cox, Storm Energy, Panama City, Fla.

LNG

from page 18

Europe and China and others could start developing their own shale gas and change the picture a little bit. The LNG supply capacity is out there, such as in Qatar, Australia and elsewhere, but with demand stagnant since 2008 because of the economic recession, we must ask if there is room for LNG from the United States in this marketplace.

Two Separate Markets

GULEN: The LNG market is two separate markets – the Atlantic and the Pacific.

In the Atlantic market the Europeans are the biggest customers and are getting their

LNG now from such places as the Middle East and West Africa.

Can the United States compete with these guys in this market?

When we look at the upstream cost here, how much shale gas can we continue to produce at increasing production levels?

What price does that require?

Some say you can make money at \$3 (Mcf), but that's questionable. I have to say, "show me." Even if upstream production is at \$3, by the time you do liquefaction facilities and things like that, at what price are you going to be able to send that LNG to Europe? Six dollars? Seven dollars?

An important thing happening in Europe is they seem to be weaning off of formula pricing that ties the price of LNG to oil. If they succeed, then LNG prices will drop because of market conditions in the LNG market.

Oil and gas prices aren't closely related anymore and move to their own tunes now. Oil prices likely will continue to go up, probably for the foreseeable future; production growth is limited because most of the attractive resource places aren't easily available.

But if shale gas is as successful elsewhere in the world as the United States, we'll have plenty of supply – not to mention the world has plenty of conventional gas all over the place.

LNG prices on an energy content basis will be much cheaper than oil, and that's why the Europeans are trying to get rid of oil index formulas – it makes LNG too expensive for them. If that happens, then definitely the Algerians, Angolans, Nigerians, Qataris can sell LNG to Europe much cheaper than the United States. That's one of the fundamental issues of exporting LNG from the United States. Also, you want to send consistent volume cargoes to customers; you can't expect to make a lot of money with spot cargoes.

As to the Pacific market, we have the Kitimat terminal in Canada – because we couldn't build it on the U.S. West Coast. It was originally designed as an import terminal, but now they have the same excess gas situation because of the attractive shale plays in British Columbia.

They use a lot of gas to heat the oil sands in Alberta. They also can send some of that gas to Kitimat if they build liquefaction facilities, and then can send it to the Pacific markets.

In all of North America, there's only one export facility, and that's in Alaska. It's been sending LNG to Japan since the '60s. The Pacific market may not let go of the oil price index formulas for LNG pricing, because energy security is the utmost priority for Japan and South Korea.

Today, the nuclear plants are down, and that's significant capacity they must substitute with something. They will be willing to pay a bit higher prices for LNG than the Europeans, so exporting LNG from Kitimat is feasible.

Caution: Oversupply is Not Forever

GULEN: We must be careful about our own needs for domestic gas once the economic recovery takes place.

There are some pressures on coal-fired generators; some are old and have emission problems like mercury, SO₂, NO_x, CO₂. If these shut down, there will be greater gas demand from industrial users, so we'll need a lot of gas here.

I'm not sure we have enough cheap gas to meet our domestic needs and also export. The nature of these markets is boom-bust, and we should not believe in a new world of \$4 gas for the foreseeable future. ■



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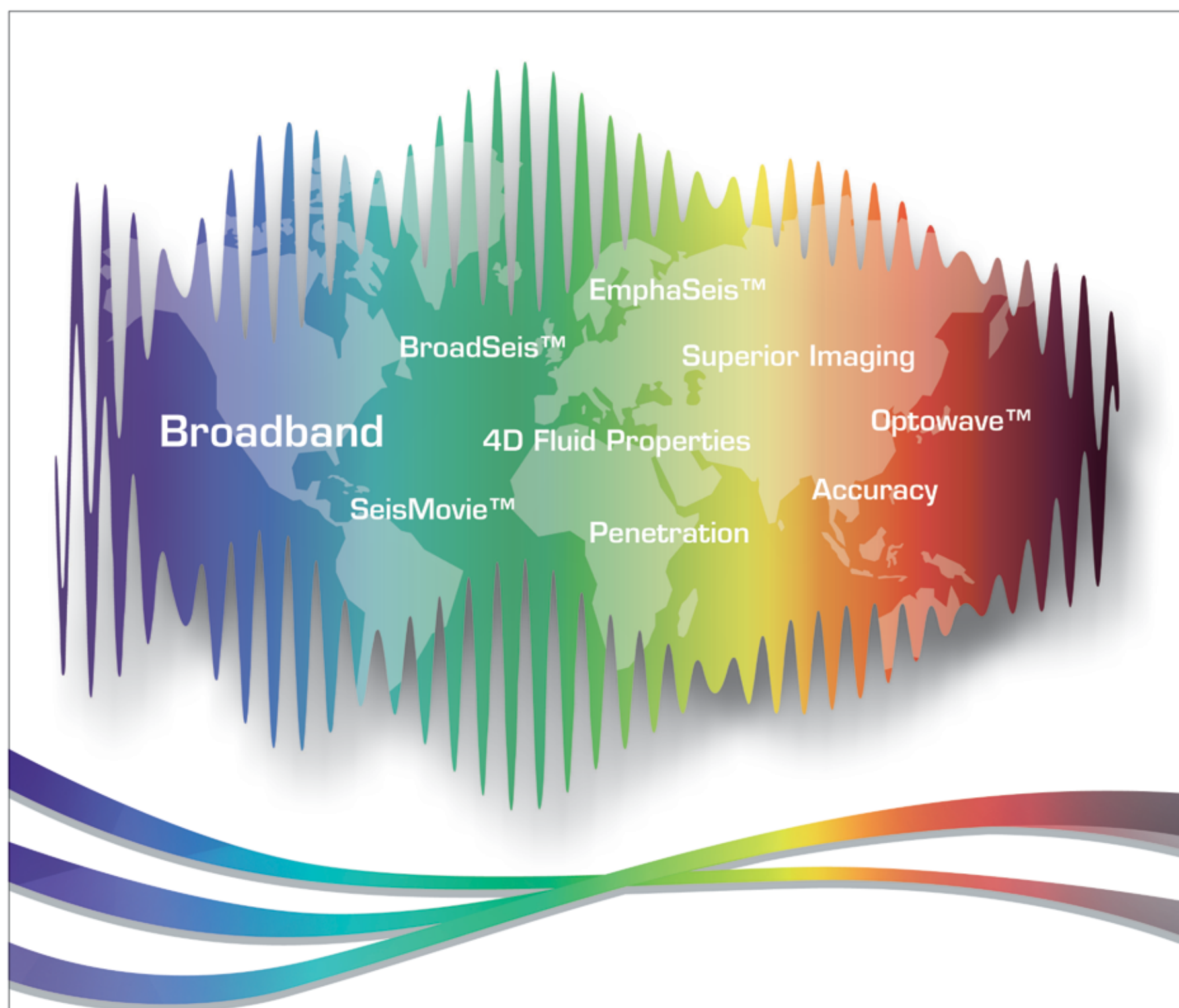
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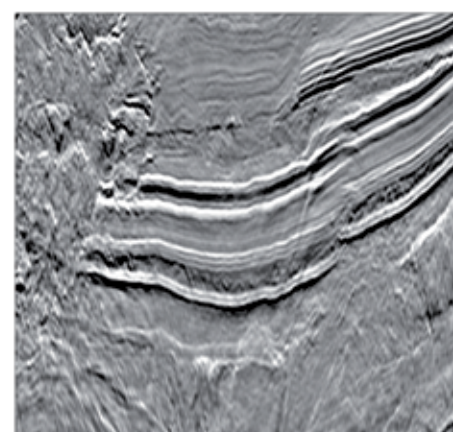
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But for how long?

Eastern GOM – Forbidden Fruit Again

By LOUISE S. DURHAM, EXPLORER Correspondent

Just one year ago drilling in the off-limits eastern Gulf of Mexico appeared to be on the cusp of getting the green light from the U.S. government as calls for “drill, baby, drill” emanated from politicians as well as the ordinary Joe.

Then the Big Spill occurred in the Gulf, and the industry’s hopes to explore this promising area were quickly dashed – perhaps for the long haul, perhaps not.

Meanwhile the so-called “permatorium” in the long-active central and western GOM waters is over, but it’s not really over – at least not until the powers-that-be get around to seriously ratcheting up the drilling permit process.

It’s all the more exasperating given that offshore western Florida is one of the last unexplored areas in the GOM. After all, there’s no known hydrocarbon cutoff line between the highly productive central GOM region and the eastern region, which has been forbidden territory for exploration since 1981.

Still, this is no cookie-cutter scenario.

“The geology of the eastern Gulf of Mexico has some similarities and many differences from the currently explored Gulf area,” said Joe Erickson, vice president of sales and business development at Spectrum Geo in Houston.

“The further you get from the Mississippi fan, the more things change,” he added, “especially in this part of the Gulf.”

“The further you get from the Mississippi fan, the more things change – especially in this part of the Gulf.”

A Lot of Data

Fortunately, optimism is a hallmark of the industry, and the folks at Spectrum appear to be imbued with a hefty amount of this trait.

They’re at work on a sizeable study analyzing 65,000 kilometers of modern 2-D seismic data processed in-house, which they acquired for the most part more than 125 miles from the Florida coast with the goal to evaluate the hydrocarbon potential of the eastern Gulf region.

The data cover portions of Desoto Canyon, Lloyd Ridge, Florida Middle Ground, The Elbow, Vernon Basin and Howell Hook protraction areas.

“This region is so important because it’s a frontier area, and we see trends successful in the central Gulf that are extending into the area,” said AAPG member Richie Miller, president at Spectrum.

“We’re doing a resource assessment that will take another couple of months,” Miller said. “We’re hoping the investigation

results will help with the lobbying efforts to open the area to exploration.”

Miller and Erickson were co-authors, along with Spectrum Geo peer G.N. Scaife, of a paper presented at the recent AAPG Annual Convention and Exhibition in Houston titled “Evaluation of the Offshore Florida Play Types Using Seismic Reflection Data.”

The talk was part of a session titled “E&P in the Americas.”

Their study examines future locales for exploration via identification of plays located on trend with existing play types.

“We’re working with the University of Alabama, also,” Miller noted. “There’s potential for some trends onshore Alabama to extend offshore to the south and east.

“For instance, there’s potential for the well-known Upper Jurassic Norphlet sandstone play to extend further into this area,” he emphasized.

“In fact, there’s current Norphlet success in the northwest area of the study, while the rest of the survey is totally unexplored.”

Still Waiting

The study team also proposes conceptual plays for future exploration and sub-divides exploration play types into:

- ▶ Shallow water, shelf opportunities.
- ▶ Moderate water depth, escarpment plays.
- ▶ Deepwater play types.

“The extensive seismic data set provides valuable information that can be used to assess the number and size of undiscovered potential accumulations in this frontier petroleum province,” Erickson said.

He noted that evaluation of the escarpment area indicates the potential for large scale shedding of carbonate debris from the platform area into potential reservoirs.

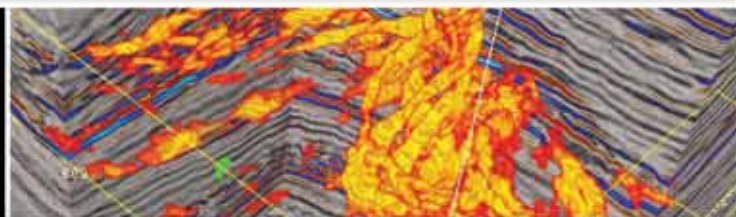
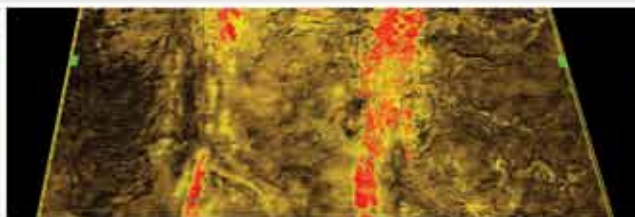
“It might be hypothesized that a singular catastrophic event could have caused large scale debris flows,” Erickson said. “There’s a possibility that this untested play type may yield the most hydrocarbon potential as the aerial reservoir extent may be the largest reviewed.”

It’s intriguing that Spectrum is waiting on the go-ahead from the permit folks to accumulate even more seismic data for the program.

“We’ve asked for a permit to acquire more seismic data – about a year ago,” Erickson noted, “but it’s not yet been approved.”

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Persistence, Teamwork Found Caño Limón

By VICTOR H. GABELA

This July will mark the 28th anniversary of the 1983 discovery of the giant Caño Limón field (1.1 Billion BO reserves) in Colombia's Llanos Basin by Oxy Colombia, a subsidiary of Occidental Petroleum.

This was the largest oil discovery of the 1980s in Latin America and might be considered the pinnacle of one of the most successful exploration streaks by an independent oil company the industry has witnessed, which began modestly in 1956 in California and continued with outstanding frequency and larger finds through 1992 under the leadership of Oxy's skillful negotiator, philanthropist and autocratic leader Armand Hammer.

If leaders can influence the culture of a company, Dr. Hammer certainly influenced Oxy's oil exploration drive with a touch of his maverick traits and ability to attract talent.

This account, however, is about Oxy's talented people who made the Caño Limón discovery possible.



GABELA



Photos courtesy of Victor Gabela

Oxy Colombia's Caño Limón discovery well, in Colombia's Llanos Basin.

major find in 1961 – the Lanthrop field, discovered in acreage where Texaco and other companies had previously drilled unsuccessfully.

Discovering oil where others had failed almost became the trademark of the Oxy of the 1960s, '70s and '80s with its discoveries in Libya, Peru, Venezuela, the North Sea, Colombia Llanos, Ecuador Oriente, Malaysia and Philippines.

In 1980 the Llanos of Colombia was a vastly underexplored territory. However, at least four major oil companies had carried reconnaissance exploration in the Caño Limón area in years prior to Occidental. In fact, one of them had made a discovery in the deeper part of the basin, some

way down dip from the eventual Caño Limón discovery, proving that oil had been generated in the northern Llanos Basin.

Ironically, this same company, against the geological wisdom of searching for oil up dip, rejected the Caño Limón prospect farm in offer from Oxy. As Oxy's charismatic Latin America exploration leader of the '80s John Carver would have said, "UP DIP, UP DIP is where the oil is!"

While the Caño Limón discovery was, as stated by James B. Taylor and Chuck McCollogh, the result of the "favorable combination of exploration methodology, contractual and operational flexibility, financial and technical commitment, perseverance and an exploration

approach unconstrained by past experience and models." It also was the result of Oxy's self-motivated, talented people who made up the exploration teams in home office and in Colombia and of their passionate dedication to the company goals inspired by the vision and professional skills of Oxy leaders of the time, including:

- ▶ Dick Vaughn.
- ▶ John Carver.
- ▶ Team pushing-mentor James B. Taylor.
- ▶ Rock Fisher.
- ▶ Mel Fischer.
- ▶ Geophysicist Jim Kurfess.
- ▶ Chuck McCollogh, the father of Caño Limón.

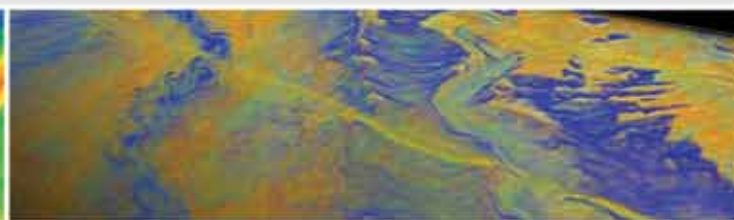
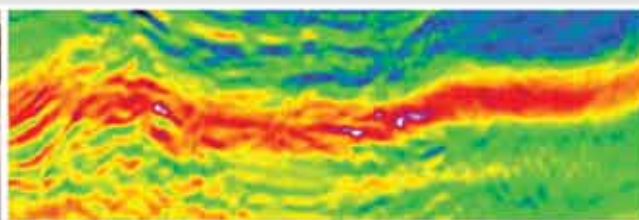
▶ Richard Hollenbaugh.

Had Hollenbaugh, with his endless enthusiasm and optimism, not convinced home office management to maintain a small office in Bogotá after the failed exploration campaign of Oxy in the Middle Magdalena Basin in the late '70s, and searched for new acreage opportunities in the Llanos as a country manager, perhaps Oxy would have left Colombia and Caño Limón would have been another company's discovery – and had he not "negotiated" with contractors to accept IOU's until the discovery well AFE was approved, the Caño Limón discovery would have to wait or not be Oxy's.

Continued on next page

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Continued from previous page

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Chuck McCollogh, as country exploration manager, and Don Conner, home office regional stratigrapher, led the initial geological Llanos evaluation that identified the preferred exploration areas in the Llanos Basin and resulted in the recommendation for the 12 MM acre position Oxy acquired in five blocks in 1980. I still can remember the nervous laughter of managers John Carver and Jim Taylor when such a huge acreage recommendation was presented at a technical meeting at Oxy's Bakersfield home office.

On the other hand, such vast acreage was a geologist's dream "play ground" for Oxy home office geologists, Malcolm Allan, Victor Gabela and Earl Padfield, the trio, in support of the exploration effort carried out in Colombia by geologists Ismael Ramirez and Jaime Vargas – and under McCollogh's able leadership – formulated exploration ideas based on regional concepts, existing seismic and well data, photo geology, satellite imagery, drainage patterns, "creekology," etc., to catalog identified anomalies and leads, however subtle, to test in 20 stratigraphic wells (of which 10 were completed as exploratory) that preceded the Caño Limón discovery.

Had this coordinated teamwork not existed, the discovery might not have happened when it did.

On a second exploration phase one key player was the very capable geophysicist Rodolfo Anzoleaga, who was responsible for timely mapping the incipient Caño Limón lead, which justified additional seismic acquisition when financial resources were dwindling. Rodolfo would go on to refine the structural interpretation of the discovery site's relatively small fault controlled fold.

No less important was the contribution of non-technical personnel like Art Pereira, whose task was to organize the move of the rig via treacherous roads by the northern Venezuela-Colombia border to an island location, robbed to the Caño Agua Limón stream in a short-lived dry season, and literally drag rig components through muddy terrain unto barges to the Caño Limón location at the onset of the rainy season.

Pereira also is attributed to having suggested to McCollogh shortening the name "Caño Agua Limón" to Caño Limón in naming the discovery well.

On a humorous note, the eventual discovery was especially sweet for the original proponents, because of so much negativity by some experts – and the declaration by a well-respected petroleum research company that "the Llanos Basin does not have the potential for commercial oil."

I believe Oxy was destined to make the Caño Limón discovery when efforts to farm out the Caño Limón prospect failed after showing it to almost 60 industry E&P companies. If opportunity is the combination of favorable circumstances, the Caño Limón discovery story embodies such definition, where a free spirit and creative company culture merged with talented people and destiny to make the oil find of a decade.

* * *

To take part in an exploration effort that results in a discovery the size of the Caño Limón and also participate in its development; live its reserve growth from an initial 60 MM BO to a 1 billion plus oil giant; witness the construction of a monumental trans-Andean pipeline and offshore loading facilities to bring the field production to export in a record time, and to work side-by-side with very dedicated, top notch

professionals from Oxy's ample pool of specialists, such as production geologists Cal Parker, George Kendall and Mike Cleveland; geophysicists Geoff Gates, Julio Perez and Neville Manderson; reservoir and operations engineers John Trahan, Ray Rivero, Guimer Dominguez and Carlos Mateus; Les Stewart, VP-engineering Leon Daniels, pipeline project manager Bernie Larsen, Derek Jones, Paul McInnes and many other brilliant people, is an experience that comes once in a career time for which I remain grateful to Oxy.

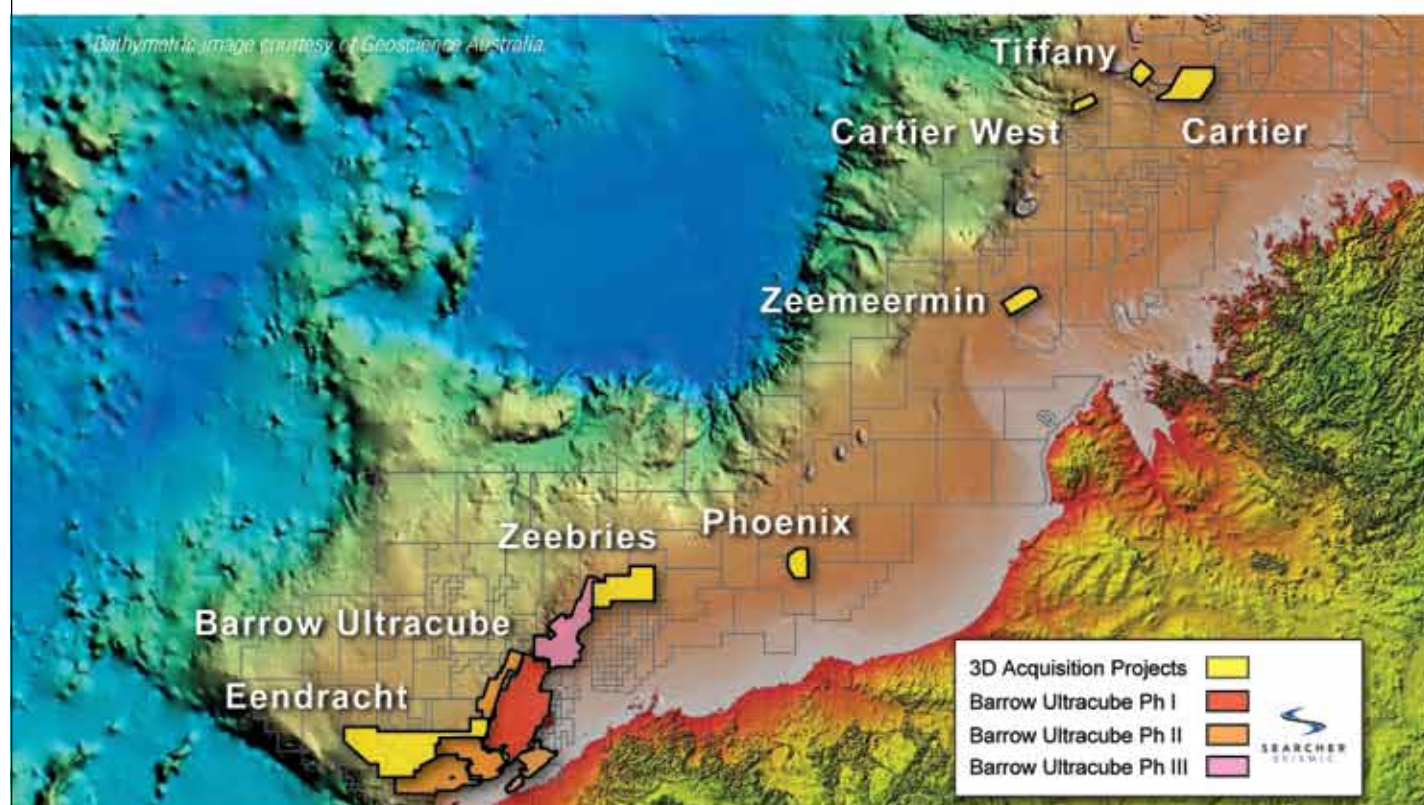
(Editor's note: Geologist Victor H. Gabela succeeded Chuck McCollogh as exploration manager Oxy Colombia after the discovery well, and became vice president of exploration and development for Oxy Colombia from 1983-89 and 1992-95.

He currently is president of EL Dorado Energy SAS, Bogota, Colombia.)



From left to right: Earl Padfield, Chuck McCollogh, Jim Taylor and Victor Gabela with the then-newly appointed president of Oxy Exploration & Production, David Martin.

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Tiffany - recent acquisition of ~730 km² in the Vulcan Basin.

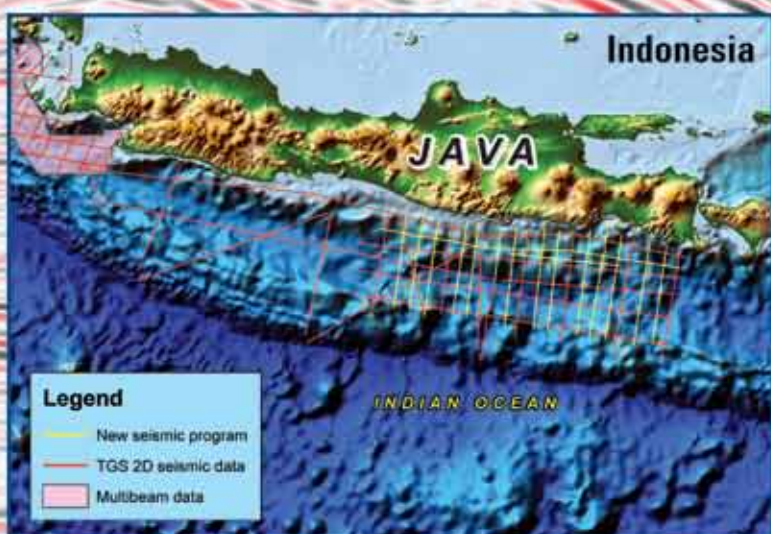
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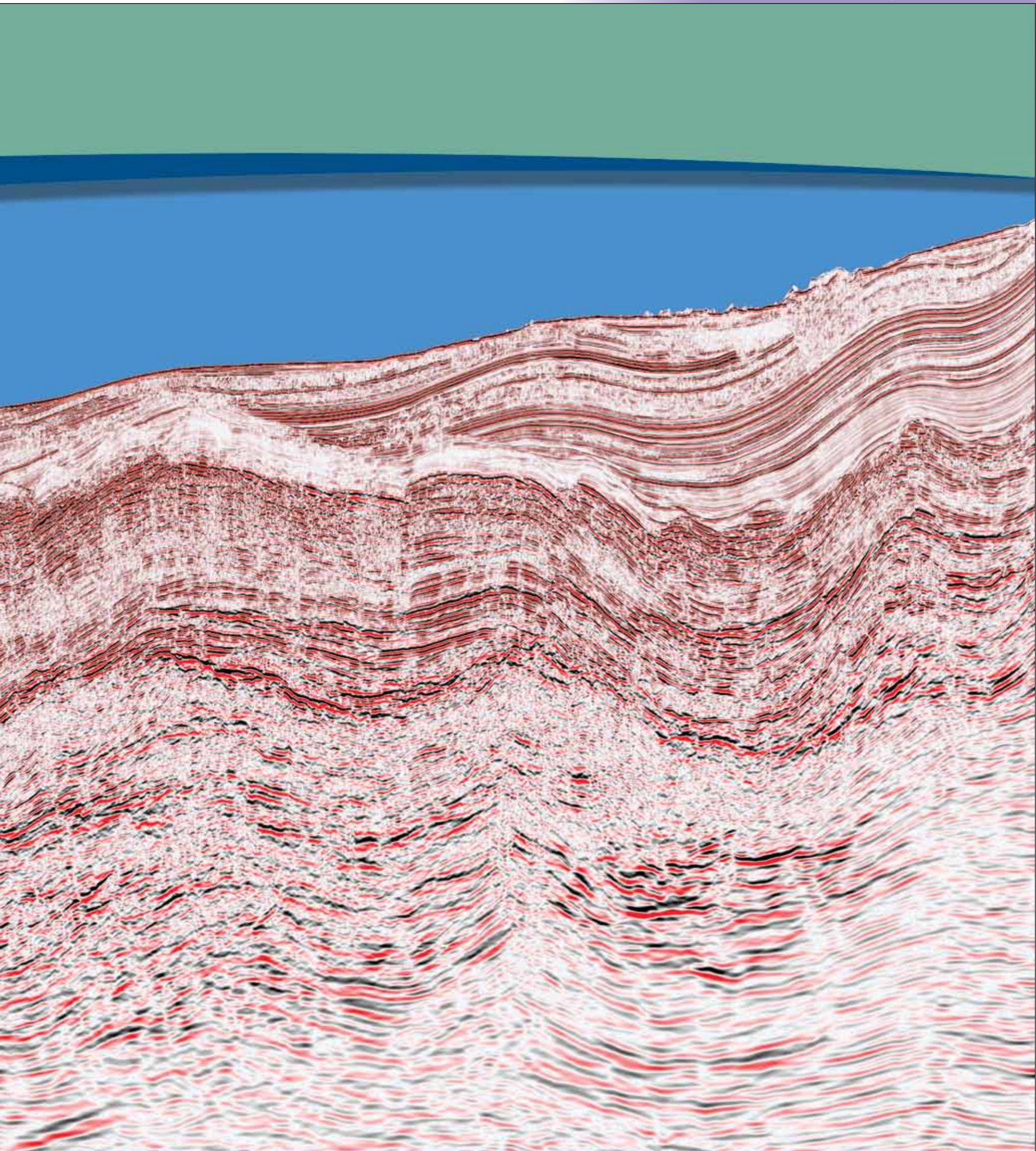
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TGS has 8,640 km of newly acquired long offset seismic and gravity data in the South Java forearc. For the first time, the new data images a thick package of sediment as shown in the intermediate product above. It has similar characteristics to Mesozoic and Paleozoic NW Shelf Australian sediments. The potential for a working petroleum system is high and yet to be tested.

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Member keeping tabs on debate

What Did They Say About Climate Change?

By BARRY FRIEDMAN, EXPLORER Correspondent

Obviously, Mark Twain was not referring to today's climate change debate when he said, "A lie can travel halfway around the world while the truth is still putting on its shoes."

For the two sides involved in trying to get their respective messages out, though, it must seem like one is always tying up its laces while the other is holding press conferences in Stockholm.

And it's why AAPG member Hannes Leetaru, a petroleum geologist at the Illinois State Geological Survey and panelist on the Division Energy Forum at the 2009 AAPG



LEETARU

Annual Convention in Denver, thought it was important to track not the actual merits of the conversation, but the actual

The Carbon Capture Report delivers a daily briefing of sorts on the debate – to and from both sides.

conversation itself.

To do that he started his own website, www.carboncapturereport.org, which

monitors global news and social media coverage of those who believe in the catastrophe of climate change, those who deny it and those institutions, governments and scientific associations on all fronts throughout the debate.

"That's actually been a real focus for us," Leetaru says of his desire to produce a website that tracks all the information on climate change, "to ensure that we simply report on the prevailing stories of the moment, rather than advocating for one side or the other."

The "us" he cites includes his son, Kalev. "I had just read Michael Crichton's 'State of Fear,'" the elder Leetaru said, "where he made the claim that interest in global warming peaks in the summer when it's hot out and is lower in the winter when the temperatures are cooler. I asked my son if there was a way his data mining techniques could be used to test whether that was really the case."

There was.

And in 2006, in Virginia, father and son published a poster at the 2006 Annual Conference on Carbon Capture and Sequestration.

"We found that, indeed, news coverage of global warming did peak in the summer and had been increasing steadily over several years," Leetaru said.

There was something else, too.

"We also found that nearly 80 percent of the top 100 websites returned by Google for carbon capture and sequestration were based in the United States."

Data Mining

Leetaru felt the website needed to expand its base – not only in what it included, but from where the information emanated.

On the site, then, there is a range of tools, from interactive maps, to timelines, to rankings of those individuals making news, both nationally and internationally.

Knowing that politics is the yang to the facts' yin in the debate, Leetaru is mindful of the land mines in front of him.

"Given the emotional nature of the field, we certainly get quite a bit of questions and accusations on this from both sides," he said, "so in this respect we feel that we are doing a good job of remaining neutral in this respect."

Leetaru believes that by utilizing advances in his son's data mining techniques to summarize and synthesize the overall global discourse on climate change each day, the Carbon Capture Report delivers a daily briefing of sorts on the debate – to and from both sides.

"We don't advocate or promote any specific viewpoint, or filter, censor, prioritize, de-emphasize or otherwise alter the information we find," he stressed. "Our focus isn't to try to 'correct' or 'advertise' for any specific view; we just report on what's resonating with the public at that moment and what the latest developments are."

As an example, he gives the case of a new wind turbine field: It might, he says, "generate both criticism and praise from different groups," but his goal is to simply report on how the news and social media overall are reporting on the project.

"Are people within a specific geographic

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Continued on next page



AAPG member Hannes Leetaru's website provides a quick look at the daily news and reports involving climate change.

Continued from previous page

location promoting wind turbines as a positive new energy source," he asks, "or are they against them due to concerns about noise or impact on local bird populations?"

A Need for Transparency

When asked which side was gaining traction, he was, as usual, diplomatic.

"When you look across the global spectrum that we monitor, you see both of those stances well-represented in the data."

There was, though, a noticeable shift, he says, in the aftermath of what came to be known as "Climategate."

"Obviously Climategate brought to the forefront the fact that scientists have been doing a very poor job of communicating their work to the public," he said. "Most of the underlying data has been a black box and most of the field's output has been scientific publications in academic journals."

The "Climategate" scandal involved hundreds of e-mails that were hacked from the University of East Anglia Climatic Research Unit in 1989. Some global change deniers concluded the e-mails proved that scientists had systematically skewed evidence to support claims of climate upheaval.

"We won, you lost. Get a life," said U.S. Sen. Jim Inhofe, R-Okla., who once famously said that climate change was "the greatest hoax ever perpetrated on the American people."

Meanwhile, a U.K. House of Commons Science Assessment Panel, while concluding that researchers should have been more careful in their techniques, found

nothing sinister in the e-mails, and said "On the specific allegations made against the behavior of CRU scientists, we find that their rigor and honesty as scientists are not in doubt ... We did not find any evidence of behavior that might undermine the conclusions of the IPCC assessments."

Nevertheless, according to the stories Leetaru tracked, more stories appeared questioning the actual environmental data.

"A lot of the underlying data showing a rise in global temperatures," Leetaru says, "were called into question by poor scientific practices. So, at least in the media sphere, there is a lot more discussion these days about whether global temperatures are actually rising."

"For climate scientists, this means greater transparency in the data they use, more concrete quantifications and forecasts of what will happen if it is not addressed, and helping the public become more engaged in the discussion," he said. "In fact, you're seeing a lot more use of the term 'climate change' in place of 'global warming' to take into account that some regions are actually getting colder in recent years."

Leetaru refuses to get into the debate, but does indicate the public relations efforts on both sides are often misguided.

"Really, from what we see through all of the data we collect, there needs to be much better communication between climate scientists and the public and policymakers," he said. "Right now the focus has really been on generating new data and publications for fellow scientists, while very little outreach has been done to the public."

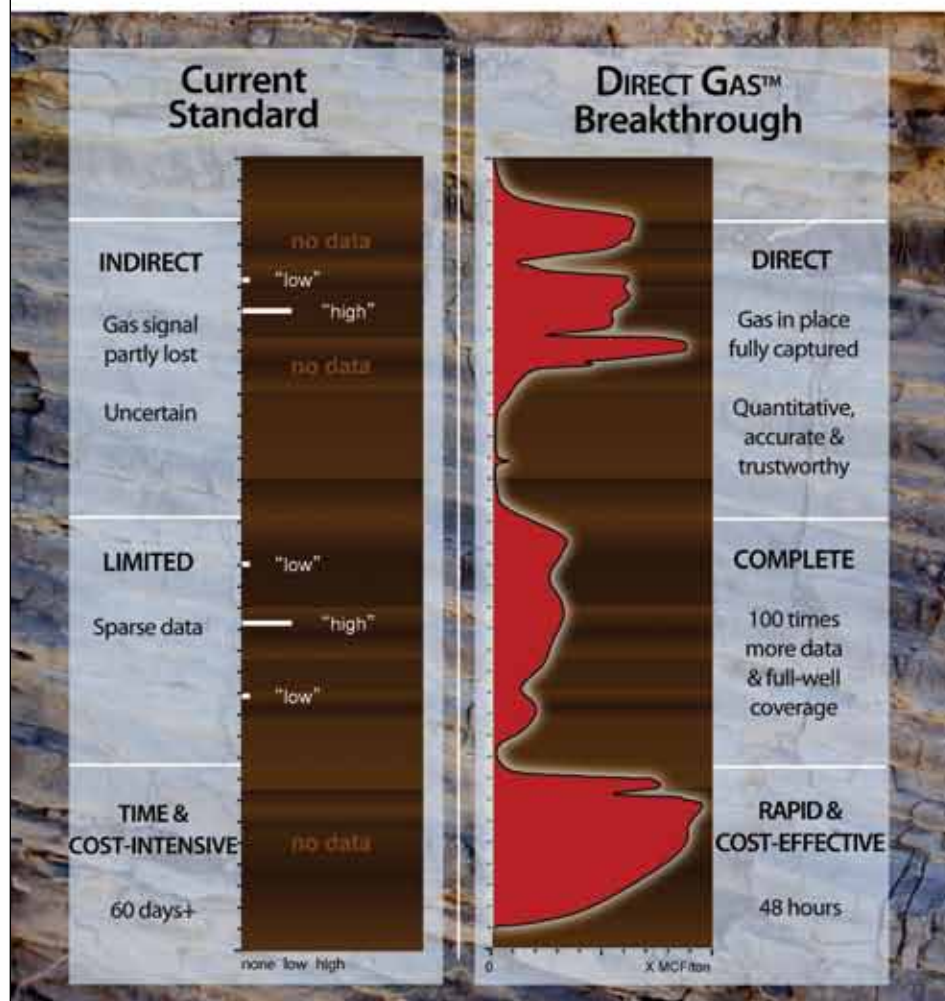
"Whether we like it or not," he added, "we live in the public spotlight, unlike most other fields, and we need to heed this and do a much better job."



An accessible, easy-to-read example of the daily view at www.carboncapturereport.org.

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Turn, Turn, Turn: Rotating for S-Wave Data

By BOB HARDAGE

This month we expand our insights into the behavior of seismic S waves as they propagate through a fractured interval, with the emphasis placed on laboratory data of real S waves propagating through fractured real-Earth media.

The experimental data illustrated on figure 1, again taken from work published by Sondergeld and Rai, simulate the general case of S-wave illumination of a fracture system in which the illuminating source vector is polarized at an arbitrary angle Φ relative to aligned fractures.

The test sample used to acquire the data was illustrated and discussed in the April EXPLORER.



HARDAGE

The wavefields that propagate through the medium are now a combination of S_1 (fast-S) and S_2 (slow-S) wavelets, and not S_1 -only or S_2 -only wavelets as were generated in the experimental data discussed last month.

Wavelets A, B, C and D are again the responses observed when the receiver is either parallel to or orthogonal to the illuminating source vector.

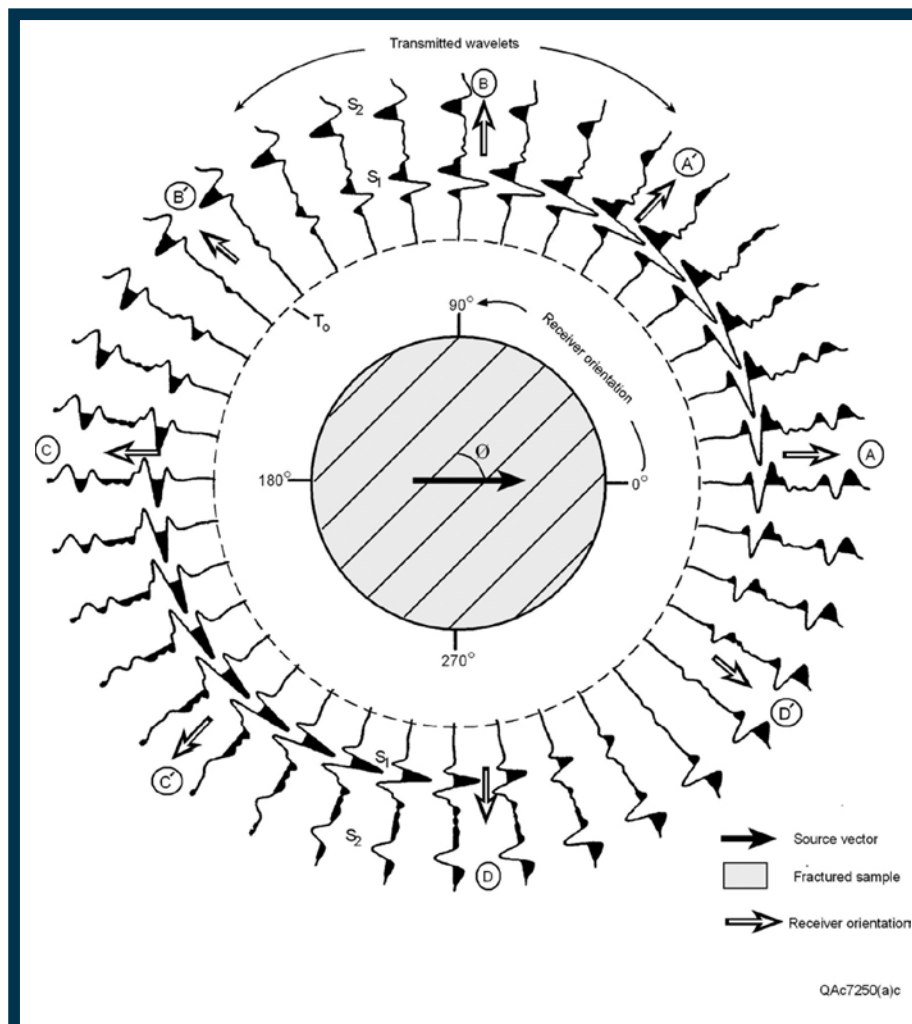


Figure 1 – End-on view of a fractured test sample from the source end. The source vector is polarized at an angle Φ relative to the azimuth of the fracture planes. As the source remains fixed at one end of the test sample, the receiver at the opposite end is rotated 360 degrees at angular increments of 10 degrees relative to the orientation of the positive-polarity of the S-wave source vector. These test data show that only a fast-S (or S_1) mode propagates parallel to fracture planes (responses A' and C'), and only a slow-S (or S_2) mode propagates perpendicular to the fracture planes (responses B' and D'). A mixture of S_1 and S_2 is observed at all other azimuth orientations. Amplitude behavior is affected by the continually changing angle between the vector orientations of the positive-polarity ends of the source and receiver elements. Dashed circle T_0 defines the travel time origin $T = 0$ for the wavelets. Modified from Sondergeld and Rai (1992).

The observed data contain both S_1 and S_2 arrivals. The length of the propagation path through the sample is such that the difference in S_1 and S_2 travel times causes the S_1 and S_2 wavelets to not overlap.

In real seismic data, when a fracture interval is thin compared to a seismic wavelength and the difference in S_1 and S_2 travel times is not too large, the response will be a complicated waveform

Continued on next page

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Geophysics advanced

UT Team Takes AAPG's IBA Top Prize

Graduate students representing the University of Texas at Austin won first place in this year's AAPG Imperial Barrel Award contest, taking the prize after a "spirited and intense competition."

The finals, which involved 12 teams from each of AAPG's 12 Sections and Regions, were held in Houston right before the start of the recent AAPG Annual Convention and Exhibition.

AAPG's IBA program is an annual basin/prospect evaluation competition for geoscience graduate students from universities around the world. The teams compete to win scholarship funds dedicated to graduate student petroleum geoscience education.

By winning, the UT team received a trophy, individual medals and a \$20,000

prize for their petroleum geoscience department.

Finishing second (Selley Cup winners) was the team from the University of Southampton, England, representing the European Region, which earned individual medals and \$10,000 in scholarship funds for the department.

Finishing third (Stoneley Medal winners) was the team from Sultan Qaboos University, from Muscat, Oman, representing the Middle East Region. They received individual medals and \$5,000 for their department.

A report on the IBA will be included in the June EXPLORER.

For additional information and upcoming pictures please monitor: <http://www.aapg.org/iba>.

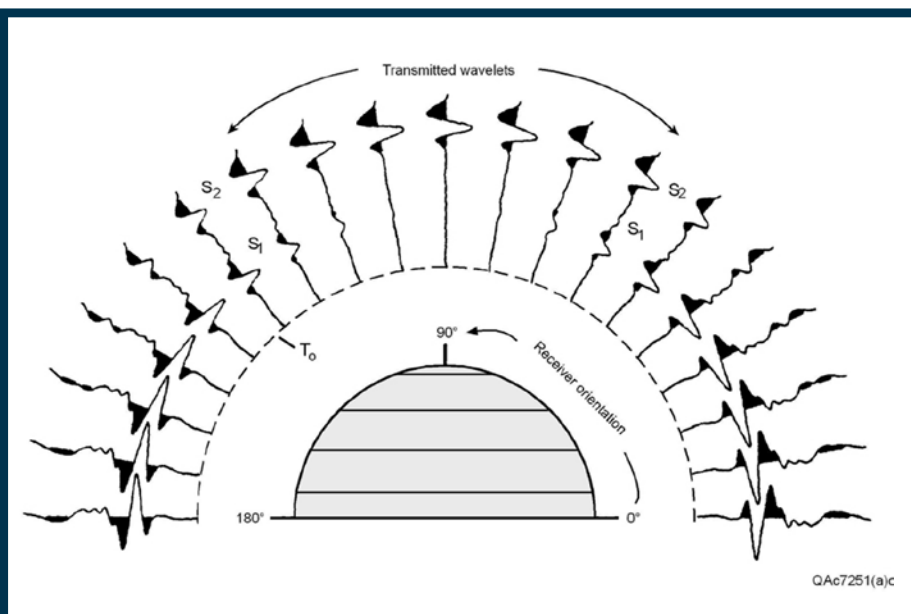


Figure 2. S-wave propagation through a fracture system observed when the source and receiver are aligned in the same azimuth, as is done when processing actual S-wave seismic data. S1 is the fast-S mode. S2 is the slow-S mode. The azimuth angle in this graphic defines the orientation of the positive-polarity end of both the source and receiver relative to the fracture planes, whereas the angle in previous figures defines the orientation of the receiver relative to the source. Only S1 propagates parallel to fractures, and only S2 propagates perpendicular to fractures. Modified from Sondergeld and Rai (1992).

Continued from previous page

representing the sum of partially overlapping S₁ and S₂ wavelets.

The wavelets at positions A', B', C' and D' illustrate important S-wave physics:

► Only a S₁ mode propagates parallel to the fracture planes (responses A' and C').

► Only a S₂ mode propagates perpendicular to the fracture planes (responses B' and D').

* * *

* * *

The experiment documented as figure 2 (above) illustrates the results that should be observed when S-wave data are acquired across a fracture system as a 3-D seismic survey in which there is a full azimuth range between selected pairs of sources and receivers.

In this test, the source and receiver are rotated in unison so that the positive-polarity ends of both source and receiver are always pointing in the same azimuth. This source-receiver geometry is what is accomplished during S-wave data processing when field data are converted from inline and crossline data-acquisition space to radial and transverse coordinate space that allows better

recognition of S-wave modes.

This type of source and receiver rotation is common practice among seismic data processors that have reasonable familiarity with S waves.

The test data show convincing proof that only a fast-S mode propagates parallel to fractures, and only a slow-S mode propagates perpendicular to fractures. At all intermediate azimuths between these two directions, S-wave propagation involves a mixture of fast-S and slow-S wavefields.

The objective of real-Earth fracture evaluation is to acquire seismic data in a way that allows source and receiver rotations to be done to create data similar to that shown on figure 2. These rotated data are then searched to find the azimuth direction in which S-wave velocity is a maximum.

That maximum-velocity azimuth defines the orientation of the set of vertical fractures that dominate the fracture population.

Next month: A look at another laboratory measurement that illustrated the important behavior of S waves that propagate in fractured media. [E](#)

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WASHINGTON WATCH

Energy Policy: Let the Conversation Begin

By DAVID CURTISS GEO-DC Director

Headlines proclaimed the news that automobile drivers already knew: Crude oil and gasoline prices marched ever higher as spring began. In fact, crude oil set a record of "highest March price ever."

This unwelcome news – ahead of the summer driving season and threatening a fragile economic recovery – led the White House to shift its focus to energy.

In a speech at Georgetown University on March 30, President Barack Obama outlined the latest iteration of his administration's energy policy. The headline target was a call to reduce oil imports, which in 2008 were approximately 11 million barrels a day, by one-third by 2025.

"I set this goal knowing that we're still going to have to import some oil," the president said. "It will remain an important part of our energy portfolio for quite some time, until we've gotten alternative energy strategies fully in force."

"And when it comes to the oil we import from other nations, obviously we've got to look at neighbors like Canada and Mexico that are stable and steady and reliable sources," Obama said. "We also have to look at other countries like Brazil."

"But our best opportunities to enhance our energy security can be found in our own backyard," the president continued, "... because we boast one critical, renewable resource that the rest of the world can't match: American ingenuity. American ingenuity. American know-how."

* * *

Astute observers noted the economic slump already had reduced oil imports, but at least rhetorically, the president seemed to edge closer to an "all of the above" energy strategy. He urged increased domestic oil and natural gas development, expanding alternative fuels, and enhancing energy efficiency.

But while the president's objective of reducing oil imports by one-third is "doable," it is a "false goal," as Jason Grumet, president of the Bipartisan Policy Center, said to Gwen Ifill on the PBS Newshour.

"One of the things that the energy works always struggle with is that the speechwriters get the last word," Grumet said. "And describing the goal as reducing foreign oil is a very good approach to galvanize pollsters and voters."

"But it's not really the right goal," Grumet continued. "And having a somewhat false goal, I think, does undermine our policy."

Boosting domestic oil and natural gas production is an important goal, according to Barry Russell, president and CEO of The Independent Petroleum Association of America. But in a written statement issued after the president's speech he said, "actions speak louder than words."

"Despite the rhetoric coming from the Obama administration, the federal

government continues to add new burdens to the federal oil and natural gas leasing and permitting process," Russell said. "Those new burdens overlay a process that has become laden with opportunities to delay or deny access and production of America's resources."

* * *

Meanwhile, at the other end of Pennsylvania Avenue, Congress sprang into action.

In the Senate there was a flurry of legislation introduced, ranging from bills to expand offshore exploration to the creation of a "National Energy Security Council" to move the country to oil independence. In the Senate Energy and Natural Resources Committee, legislators were working to define the "clean energy standard" that President Obama proposed in his State of the Union address.

In the House of Representatives, Doc Hastings (R-Wash.), chair of the Natural Resources committee introduced three bills to expand offshore exploration and production, as part of the Republican majority's American Energy Initiative.

"Politics is the art of the possible," observed Otto von Bismark. From these disparate bills, and others not yet introduced, our legislative sausage grinder will ideally produce a set of coherent policies that Democrats and Republicans, Congress and the White House can all agree on.

But is the issue really that we haven't found the "right" energy policy?

"We're not lacking for energy plans," Grumet said during his interview with Gwen Ifill. "What we have been lacking is the ability to create goals that have real consensus, to have metrics, so we can figure out whether we're making progress or not, and have real accountability."

"It's keeping track of those plans over time that our democracy is not really well-designed for."

* * *


As I wrote on this page in January, "Another round of energy legislation isn't the answer. Instead, we need a national dialogue that forges consensus on the energy future we are trying to build."

What do you think the nation's energy goals should be?

In an op-ed published by Politico after the president's speech, noted energy author Robert Bryce proposed one that I like: "Pledge to make energy as cheap, abundant and reliable as possible."

Unfortunately, as the president correctly noted, the United States doesn't talk about energy until there is a crisis and politicians are under pressure to act. And when they do act, the proposed solutions reflect their constituencies and ideological bent. It's also true that there are structural issues in our democracy that make sustained progress difficult.

But I don't think the task is impossible. And AAPG members are uniquely qualified to contribute to a national discussion on energy.

How could you personally facilitate this conversation within your sphere of influence? 



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House OKs Three of Four Bylaws Proposals

By LARRY NATION, AAPG Communications Director

The AAPG House of Delegates approved three of four bylaws changes in votes at its meeting at the AAPG Annual Convention and Exhibition in Houston.

With HoD Chair David H. Hawk presiding, delegates rejected the proposal to expand membership classifications and redefine the term "member," and adding Certified as a member classification.

The measure failed by a 100-80 vote. A two-thirds vote of the house was required.

Delegates approved measures that:

- ▶ Extends Student membership to 24 months following termination of academic enrollment.

- ▶ Clarified limitations on AAPG Honors and Awards relating to officers, candidates and division presidents.

- ▶ Changed 50 words in the bylaws to make them gender neutral – i.e. chairman to chair.

There were 208 delegates certified at the beginning of business to vote on AAPG business, of the 218 delegates potentially eligible for voting privileges.

In addition to a eulogy from the floor for Owen Hopkins and past HoD chair Harry A. Miller (see accompanying article

below) Hawk made a special chair's recognition and presented an award to Houston delegate Dwight M. "Clint" Moore for his services over the years.

Hawk also passed the gavel to Jeff Lund, of Houston, who will assume the House chair on July 1. Lund will preside at the 2012 HoD meeting in Long Beach, Calif.

Delegates also elected Denver independent Robert Randy Ray as - chair-elect and David Cook as HoD secretary/editor.

Owen Hopkins, Harry Miller Remembered

The AAPG House of Delegates paused for a moment of silence during its meeting in Houston in memorial respect for past HoD chairman, Harry A. Miller (April EXPLORER) and award-winning member Owen R. Hopkins, who enthusiastically spearheaded projects to introduce geology to school children and teachers.

Hopkins died March 29 in Corpus Christi, Texas, after an illness. He was 63.

Hopkins joined AAPG in 1974 while a master's student at Tulane University. He previously earned a bachelor's in geology from the University of Oklahoma.

He worked with Chevron, Holly Energy, Sexton Oil and Harkins & Company, and retired in 2005 as vice president of exploration with Suemaur Exploration to pursue his passion for volunteering to spread the word that "Science is Fun."

His initiatives included "Maps in Schools," "Bones in Schools" and "Boulders in Schools," and resulted in 1,657 geologic maps in elementary schools nationwide, in addition to educating teachers to use maps, fossils and rock samples in their classes.

He was a member of the AAPG House of Delegates and received the AAPG Public Service Award in 2009.



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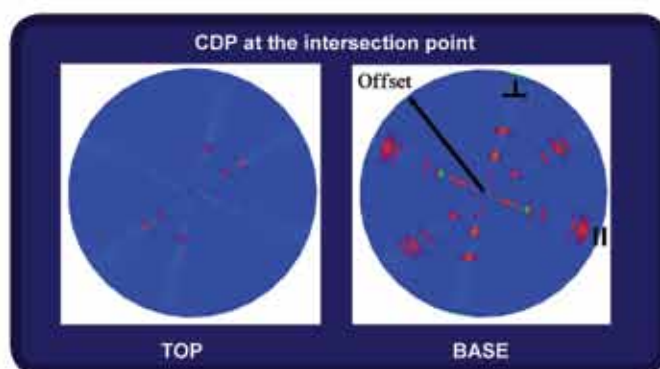
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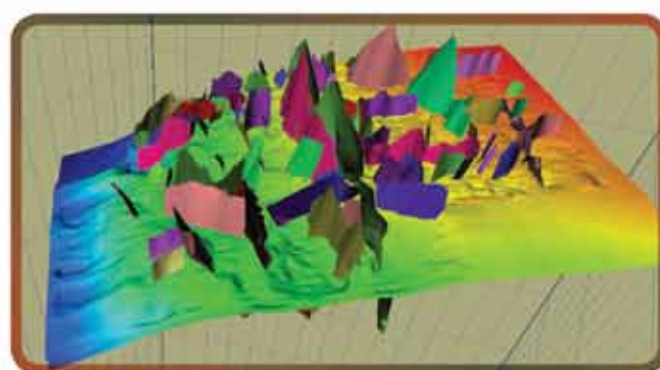
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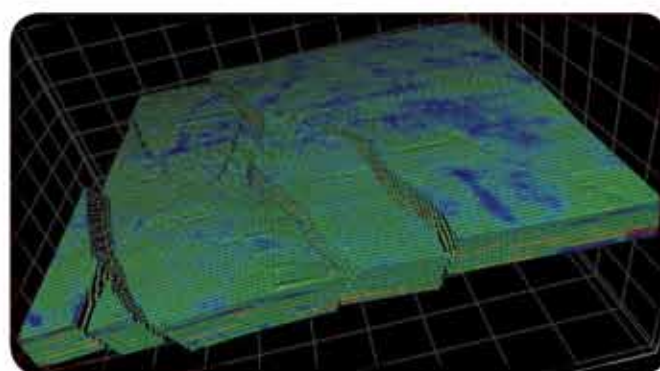
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Group effort yields success

Cairo Barrel Team Hurdled Barriers

By CAROL MCGOWEN, Regions and Sections Manager

What does it take to compete in the global IBA competition?

Intelligence, confidence, analytical thinking, creative problem solving? Certainly. Mastery of geology, geophysics and geochemistry concepts and applications are a given.

Poise, polish and excellent presentation skills rank highly among most IBA judges.

But aside from the technical acumen acquired through years of university classes and field studies, sometimes the path from Regional qualifying IBA competitions to the global IBA competition requires more resources than any one team can muster.

In fact, in some cases, the path to the global IBA presents challenges so great, they are far beyond what any one team can foresee.

This is the story of just one team's path to the IBA finals in Houston.

The 2011 Imperial Barrel Award Program involved 94 teams from 32 countries. Of the original 94, 12 teams overcame their own challenges and were supported by their own network of caring AAPG members who went the extra mile to ensure their team's successful journey to the finals.

In the case of the Cairo University IBA team, what it took to compete in competition at Houston was unwavering dedication and determination by the student team members, and no less than legions of caring, volunteer AAPG members – including no less than the Africa Region



The members of the University of Cairo IBA team, from left, Ibrahim Mohamed Ismael Abdelsamad, Hussein Ali Abdulaziz Abdulhafez and Ahmed Mohsen Hassan Metwally.

leadership team themselves.

Friday, January 28

World news sources reported turmoil in Cairo and massive civil protests across Egypt. Thousands stayed on the streets of Cairo into the night and for days following. In response to the protestors, Internet and cell phones were blocked resulting in a nationwide communication blackout. Universities and offices closed, including the United States Embassy in Cairo.

Tuesday, February 1

Doja Ojelabi, with Chevron Nigeria as

well as AAPG Africa Region vice president and IBA adviser for the Region, emails the Cairo University team:

"We'd like to find out if you have had any success downloading the IBA dataset. We've had a few schools with some delays and we are trying to work things out as quickly as possible. We are particularly concerned that the current situation in Egypt may also affect the schools' ability to start the data interpretation. Can you please advise on the status of things?"

Wednesday, February 2

Bill Bosworth, AAPG delegate with

Apache Egypt in Cairo, emails the Africa Region leadership and IBA team:

"The Internet is still down here in Cairo, so I doubt you will be able to communicate with most of the students and their advisers. I am at Apache, where we have a dedicated trunk line back to the U.S., and hence can send and receive emails ... so far."

* * *

Cairo has about 18 million people. For AAPG members living elsewhere it's hard to imagine the difficult circumstances in the life of university students there – an ongoing civil revolution, curfews, very limited resources, closed schools, etc.

In the face of these unprecedented circumstances, Ahmed El-Barkooky, AAPG Public Service Award-winning member, Cairo University professor and IBA team adviser, tested the students' resolve to go forward with preparations for IBA.

"I told the students – you are free now to choose not to continue, or to accept the challenge and go ahead, which will require that you manage your very tight time," El-Barkooky said.

"They chose the hard way," he said.

Seven weeks later, the Daily Independent newspaper in Lagos, Nigeria, reported "Cairo University, Egypt, has emerged winner of the keenly contested 2011 edition

Continued on next page

AAPG GEOSCIENCES TECHNOLOGY WORKSHOPS

Focused Workshops to

Resource Plays in Tight Unconventional Reservoirs: Multi-Disciplinary Technological Challenges and Solutions

12-14 June 2011 • Banff, AB, Canada

Recent drilling successes from the Horn River and other Western Canadian gas and oil resource plays have captured the attention of operators and investors from around the world. The estimated volumes of resource in place, together with new pipeline projects and the planned Kitimat LNG export terminal, will soon open this area to Asia Pacific export markets. New opportunities, market access, and the urgent need to meet both North American and global energy demands require industry professionals to quickly master an understanding of resource plays in western Canada and the north-central United States. In just two and one-half days, GTW Canada offers case studies and interdisciplinary discussions to deliver practical, cutting-edge knowledge. Even more, the unique GTW format of small group discussion among geologists, geophysicists, engineers and service companies, promises to foster business partnerships

Unconventional Resources: Basics, Challenges and Opportunities for New Frontier Plays

26-28 June 2011 • Buenos Aires, Argentina

Argentina is emerging as a Latin America Region leader in shale gas potential. Since 2008 when the Argentine government initiated price incentives to companies investing in unconventional gas production, investors and international operators have been picking up substantial acreage in the Neuquen Basin. Recent government-endorsed price deals ranging from \$4.5 to \$6 per million Btu provide the economics needed to make unconventional gas plays in the basin very attractive.

Co-hosted by the AAPG Latin America Region and the Asociación Argentina de Geólogos y Geofísicos Petroleros (AAGGP), this interdisciplinary workshop will start with the basics of unconventional resource plays, including play evaluation. Later sessions will delve deeper into issues of shale gas and tight gas exploration and production, with case studies from the Neuquen. Analogies from unconventional plays in Canada and USA will offer lessons learned. Presentations on completion techniques and development strategies for unconventional resources will round out the workshop program.

Following each session, all GTW participants will participate in small group discussion called an IPOD analysis (Issues, Problems, Opportunities, Directions). The process results in a unique exchange of ideas, experiences, and opportunities for future collaboration.

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

Continued from previous page

of the AAPG Africa Region Imperial Barrel Award competition, which took place on Thursday, March 17, 2011 at the Peninsula Hotel Lekki."

The news article lauded Cairo University as "edging out 11 teams from other universities in Nigeria, Ghana and South Africa."

All IBA teams are judged by a consistent grade system that awards marks for introduction, regional context, integrated petroleum analysis, basic technical interpretations, risk assessment, volumetrics and business recommendations – as well as teamwork.

Looking back to the IBA qualifying competition in Lagos, El-Barkooky remembered the teamwork that bound together the university students as they were leaving Cairo for Nigeria.

"They got the visa for Nigeria on the same day of the trip. With their bags in their hands they went directly to get the military permit from the army to go abroad," he said.

"From there, they went straight ahead to the airport to start their flight over Lebanon to Lagos. There was no direct flight that day (March 16) to arrive on the morning of the 17th – the day of the African competition."

After the euphoria of winning AAPG Africa's regional IBA competition subsided, the reality of challenges that were waiting on the path to Houston began to sink in.

The Cairo team had to arrive in Houston no later than Friday night, April 8, to present on Saturday, April 9.

* * *

The next step on the path to Houston was to obtain a temporary non-immigrant visa from the U.S. Embassy.

Normally, the visa application and interview process could easily be accomplished by applying for a visa interview online, then going to the embassy in Cairo at the appointed hour and date. However, the consular services announcement from the embassy confirmed that the visa process would be anything but normal:

"Due to security concerns, all visa services at the U.S. Embassy in Cairo are suspended until further notice. Applicants who need to travel to the United States before resumption of full visa services in Cairo may apply for a non-immigrant visa at any U.S. embassy or consulate outside Egypt. The non-refundable application fee must be paid in the country of application, according to procedures established by each U.S. embassy."

Determining exactly which U.S. embassy outside of Egypt was an easy decision. Stable political conditions in Morocco, together with the presence of AAPG Delegate, Almoundir Morabet, Tamounda Consulting, and AAPG Africa Region membership chair, Haddou Jabour, ONHYM, were reassuring.

How would the team get to Casablanca to get their visas? Who would pay the fee "in the country of application?" Would the embassy expedite the visa process to enable the team's timely arrival in Houston?

At this point, the team quickly expanded its resource base by contacting AAPG headquarters and the Region leadership for assistance – and the added challenge of timing and logistics for a round trip from Cairo to another country and back, prior to the Cairo-Houston trip, steeled the resolve of the now-expanded Africa Region leadership-AAPG headquarters staff-Cairo University team.

All efforts quickly focused on the timing

and process required to obtain a U.S. visa from the embassy in Casablanca.

Thursday, March 24

At 7 a.m., an email from Bill Bosworth arrived:

"Please find attached the visa application confirmations for each of the Cairo team members. They completed the applications in my office today (via Apache's reliable Internet access).

* * *

From here, AAPG staff went online and successfully scheduled the interviews for May 30, while coordinating with the travel agent who booked airline tickets to Casablanca for May 29.

Meanwhile, the Cairo IBA team applied at the Moroccan Embassy in Cairo for tourist visas to Morocco. AAPG headquarters staff contacted the Moroccan Embassy explaining the circumstances and requesting expedited service.

As it turned out, the team would apply twice and receive Moroccan visas for two trips to Casablanca – one for the U.S. visa interview, the second to pick up the visa en route to Houston.

For the visa interview itself, required documents included a print out of the visa appointment confirmation, a receipt for payment of visa application fee (to be provided by Almoundir Morabet), copy of the round-trip airline e-ticket, documentation proving family ties to Egypt, and an invitation letter from AAPG.

In a time zone seven hours earlier than Cairo, AAPG headquarters also wrote letters for each student, sent via email with the subject "URGENT- Non-immigrant Visas for Egyptian Students" to explain the once-in-a-lifetime opportunity the trip to Houston

represented and request expedited service.

The next challenge was the requirement to "Pay a non-refundable application fee of \$140 or the equivalent in dirham at any branch of Banque Marocaine du Commerce et de l'Industrie (BMCI) in Morocco except the one at Gauthier and Rue d'Alger in Casablanca," clearly stated on local U.S. consulate general's website.

Friday, March 25

Almoundir Morabet took the train from his office in Rabat to the consulate office in Casablanca, paid the application fees and made a hotel reservation for the students' overnight stay in Casablanca. Morabet scanned the payment receipts for the students, because payment verification is a required document the students would need to present at their visa interviews.


Tuesday, March 29

Morabet's son met the Cairo team at the Casablanca airport and drove them to their hotel.

Throughout the process, time zone challenges made for many late night and early morning emails and telephone calls. Daily, sometimes hourly status reports and decisions were communicated between the IBA team and helpers in Cairo, Tulsa, Rabat, the Africa Region IBA committee in Lagos, and other concerned Region leaders in Nigeria, Libya and Ghana.

* * *

Footnote: In all, the Cairo University IBA team traveled a combined distance of nearly 24,000 miles.

The U.S. Embassy in Cairo resumed visa services to the public on April 10 – two days after the conclusion of the 2011 IBA global finals competition in Houston. 

Enhance Your Career



Success in the Marcellus and Utica Shales: Case Studies and New Developments

23-25 May 2011 • Baltimore, Maryland

This workshop will take an interdisciplinary approach to analyzing case studies of Marcellus and Utica shales. Presenters will come from asset teams and research teams of current operators. The presentations and discussions will include basin geology, shale mineralogy, organic-matter type, gas geochemistry, structural style, along with discussions of emerging plays in southern Canada. Biogenic vs. thermogenic gas will be discussed, as well as an analysis of natural fractures and their role both in exploration and in completion / production. will discuss keys to "sweet spots." Each session will include an IPOD discussion (in-depth discussion on issues, problems, opportunities, and directions).

U.S. Shale Plays

2-4 August 2011 • Fort Worth, Texas

At last count, there were at least 20 serious shale gas plays in the U.S. Which ones have performed well? Which ones seem to have the most potential? How do they differ from each other, and what commonalities that allow you to prospect for "sweet spots" and to design effective hydraulic fracturing programs? What do we now know about the geochemistry of some shale plays that leads us to find areas that produce both gas and condensate / light oil? What are some of the new breakthroughs in technology that can help you develop a more efficient program that increases your return on investment? Compare and contrast shale plays, along with other resource trends, to develop an exploration and production approach that works for you and your organizational objectives. We will present case studies on plays and overview technologies used in new ways to give you powerful new tools in your shale play development.

International Shale Plays Geosciences Technology Workshop

10 -11 October 2011 • Houston, TX

Join us for two days of presentations and discussions focused on emerging shale plays in the international arena. Presentations will focus on the application of technology and geoscience to shale plays around the world.

Technologies and Geosciences Applied to Shale:

Fractures / Micro-Seis in Shale Plays
Importance of Pore Pressure in Shale Plays
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Petrophysics for Shale Plays

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- **Significant New Discoveries Worldwide / Case Studies
- **Europe and Middle East Shale Plays: Unique Aspects
- **Central and South American Shale: Rock Mechanics / Petrophysics / Geochemistry
- **Canadian Shale Plays: Integrated Geochemistry, Reservoir Characterization
- **Shale Plays in the Asia-Pacific Region: Applying Lessons Learned from Other Regions

Register online at www.aapg.org/gtw

SPOTLIGHT ON

*Finding art in his science***Doré Like a 'Kid in a Candy Store'**

By KEN MILAM, EXPLORER Correspondent

AAPG award-winning geologist Tony Doré once almost tossed a budding career in geology to hit the road with his guitar.

Fortunately for the profession and the industry, he chose geology – and finding the art in his science, Doré eventually found himself leading some stunningly successful oil-finding efforts.

While scaling the corporate ladder with Conoco and later Statoil, he built a reputation as a “forward-thinker,” integrating ideas from industry,



DORÉ

academia, earth science and new technologies from different disciplines.

Along the way, he said, he also developed a passion for “the deal.”

“Since chasing down new opportunities is the fun part for me, I’m happy.”

For his contributions to geology, Doré recently was honored as a member of the Order of the British Empire – one of his country’s highest civilian honors – and last month he received a 2011 AAPG Special Award, presented at the AAPG Annual Convention and Exhibition in Houston and given for a career that is “worthy of Association recognition.”

Doré, who during his career with Conoco had developed expertise in basin modeling, stratigraphic correlation and northwest European paleogeography, said he felt like a kid left alone in a candy store when he joined Statoil in 1994.

“Statoil had something much more ambitious in mind and gave me free rein to pull together the whole tectonic evolution of the northeast Atlantic as the basis for their ambitious acreage acquisition policy,” he recalled shortly before receiving his AAPG award.

“It allowed me to further develop ideas on ocean margin structure, basement reactivation, passive margin compression, volcanic margins, exhumed petroleum systems and frontier source rocks.”

A Man for All Seasons

Doré said that of the various ideas his teams pursued, several proved fruitful in searching for oil and are often quoted by industry and academia, including:

- ▶ Having an integrated view of the tectonic evolution and petroleum systems of the North Atlantic.

- ▶ Understanding the behavior of uplifted (exhumed) petroleum systems, and systematizing the differences between those and continuously subsiding systems.

- ▶ The nature and mechanics of inversion on passive margins and its importance to prospectivity.

- ▶ And, in his words, “Our models of basement reactivation on the northeast Atlantic margin seem to have been quite influential.”

Doré also has been lauded for encouraging the use of new technology.

“When I started in Statoil the big deal was AVO and amplitude-driven exploration,” he continued. “There appeared to be a sincere belief in the industry that we would be able to achieve 100 percent predictability in exploration using these techniques.

“It seems absurd now, but that was not an uncommon mentality,” he said. “As usual, nature turned out to be not quite so simple.”

Entry to the Gulf of Mexico has been a crash course for Statoil on use – and necessity – of wide azimuth, rich azimuth and full azimuth 3-D seismic, imaging of complex subsalt prospects, he observed.

He also currently is particularly interested in Arctic technology, from exploration to environmental to field development.

“The challenges in the Arctic are so great that industry cooperation between the few key players will be required,” he said, “pretty much (like) in the early stages of Gulf of Mexico with Deepstar.”



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Continued on next page

Continued from previous page

Game-Changing Impact

Refocusing from northwestern Europe to North America was challenging.

"When I was charged with (re-entering the Gulf of Mexico) the geology was completely different to what I and my small band of geoscientists had encountered in northwest Europe," he said, "but we commissioned some very good advisers and learned fast.

"When the merger between Statoil and Hydro took place and eastern Canada came into his portfolio, it was much more like the old familiar North Sea petroleum system," he said.

"Statoil had exited from the Gulf in 1999, so ... bringing us back required building corporate belief," he recalled. "We took the best advice we could and decided to focus on just a few emerging ultra deep water plays. We also targeted companies with large portfolios and expiry issues in our focus areas who we figured might need some help in getting their acreage drilled.

"Some bluntly told us to go away," he said, "but others saw the potential of the match and welcomed us."

Because of the hard work of "a few great people," the company succeeded in building corporate conviction and re-entered the Gulf in 2004. The initial deals were a multi-well farm-in with Chevron followed by a bigger deal with ExxonMobil.

"Both were in the deepwater Paleogene play," he said. "Both led to discoveries, and it goes without saying that a bit of oil certainly helped lay the psychological foundations to continue."

When the Encana deepwater GoM acquisition came along "it fit perfectly into our strategy and our initial position," Doré said, "and that deal is widely regarded as the game-changer that made us a real GoM player. We have been able to build out from our initial strategic focus to the quite significant position you see in North America.

"I would never claim responsibility for Statoil's success in North America," he said, adding "there are many visionary people who deserve that accolade. But I would passionately argue that my team laid the basis for it."

A Song In His Heart

In nominating Doré for the AAPG Special Award, Phil Christie called his friend and colleague an "enlightened senior manager" who has maintained cutting-edge technical contributions despite a demanding work schedule.

Doré has had some 50 peer-reviewed papers published and edited six books, including the latest in AAPG's "Petroleum Geology of NW Europe" series.

He also has served on numerous bodies involving both academia and industry.

"How Tony finds the time for these extra-curricular activities and holds down a demanding management role in Statoil-Hydro is amazing," Christie said, "but it testifies to his drive to promote a single community of geologists undivided by academic or industrial affiliation."

A good partner helps, too.

"My wife, Barbara, likes me playing guitar and writing papers, but she's probably thankful I'm not into golf," he said.

He is still into music, though, calling it "icing on the cake," and he proudly notes that he received his OBE at Buckingham Palace the same day as alternative

rocker John Cale, and that his award was announced at the same time as Graham Nash's.

Incidentally, Doré played in the Statoil rock band The GEX Pistols (GEX being Global Exploration), plays several instruments and says he suffers from "guitar acquisition syndrome."

Meanwhile, professional changes and challenges keep coming.

"I've moved from VP exploration North America to VP exploration New Ventures North America," he said. "Since chasing down new opportunities is the fun part for me, I'm happy. My canvas is anything onshore or offshore from the Canadian Arctic and Alaska through the Lower 48 to Mexico.

"So," he said, "you could say I'm back in the candy store." ■



From left to right: son Michael, Tony Doré and daughter Jenny visiting Buckingham Palace.

U.S. BASINS

SHALE DATA PACKAGES

1 Indicates number of wells in basin
* Indicates well count to date (work in progress)

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South Texas Eagle Ford Basin

Partial Map Detail

EAGLE FORD SOUTH TEXAS WELLS

API	Operator	Lease	Well	County	Top Depth (ft)	Bottom Depth (ft)
429180000000	HUMBLE OIL & REFINING	DEWASHORE, MELLER D.	1-B	ATASCOSA	5436	7915
429180000000	HUMBLE OIL & REFINING	MAKES OILFIELD HARRY	1	ATASCOSA	5420	7991
429180000000	SCURRY, DAVID T.	HEWITT, B.W.	1	ATASCOSA	7514	10034
429180000000	FRAN AM PETRO CORP.	R.R. BIRDWELL	4	ATASCOSA	4325	7822
429180000000	SHELL OIL CO.	WINDLER, GERTHA H.	1	ATASCOSA	5495	10010
429180000000	SHELL OIL CO.	ELUMARK, J.W.	1	SEE	10475	12245
429180000000	SHELL OIL CO.	ROBERTSON, A.S.	1	SEE	12540	10000
429180000000	TEXAS EASTERN TRADING CO.	WABBE S&S UNIT	1	DE WITT	10087	10410
429180000000	SHELL OIL CO.	BROWN, C.D.R. S.	1	DE WITT	12725	10000
429180000000	ARCO OIL & GAS	ARCO HORROR	1	DE WITT	10030	1479
429180000000	MOF OIL CORP.	BETTER	1	FIND	5540	4640
429180000000	ATA OIL PRODUCERS	YOUNG, J.W. HARRY	1	FIND	5530	7210
429180000000	FLAC-ROPER OIL CO.	WLOD	1	FIND	5540	7230

Partial Well Data

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Lee Allison has been appointed to a two-year term on the advisory committee for the Geoscience Directorate of the National Science Foundation. Allison is state geologist and director, Arizona Geological Survey, Tucson, Ariz.

Tom C. Anderson, to senior adviser to the director, Energy and Geoscience Institute at the University of Utah, Salt Lake City. Previously chief scientist, Rocky Mountain Oilfield Testing Center, Casper, Wyo.

David B. Coddling, to manager-geosciences, Santo Petroleum, Artesia, N.M. Previously manager-new ventures and technology, Yates Petroleum, Artesia, N.M.

Gerry Flaherty, to general manager-asset development (Gorgon and Wheatstone), Chevron Australasia, Perth, Australia. Previously general manager-exploration and new ventures, Chevron Asia South, Bangkok, Thailand.

Ewa Ginal, to international marketing manager, Fugro Multi Client Services, Perth, Australia. Previously business development manager, Fugro Robertson, Llandudno, Wales.

William S. "Bill" Houston, to senior staff exploration geologist, New Zealand Oil & Gas, Wellington, New Zealand. Houston also is the AAPG Secretary. Previously senior geologist, PTTEP, Bangkok, Thailand.

Robert S. Hojnacki, to senior operations geologist, Vanco Exploration, Houston. Previously senior geologic adviser, Devon Energy, Houston.

Tim Hunt has retired from the University of Texas System, University Lands, Midland, Texas. Hunt is now a consulting geologist in Midland, Texas.

Peter Joslin, to manager of joint ventures and business development, Swift Energy Operating, Houston. Previously general manager, Venoco, Houston.

Mark Kittridge, to vice president of technology, Ikon Science Americas. Previously manager of petrophysical analysis and rock physics-subsurface technology, ConocoPhillips, Houston.

Steve Krause, to senior geologist, Sacramento Basin southern asset and exploration, Venoco, Denver. Previously senior geologist, appraisal and development (Wyoming assets), BP, Houston.

Andrew D. Miall has been appointed a member of the Oil Sands Monitoring Panel, formed by the Minister of Environment in Alberta, Canada. He previously served as a member of the Oil Sands Science Advisory Panel formed by the federal government. Miall is a professor of geology at the University of Toronto, Toronto, Canada.

Robert A. "Bob" Phelps, to vice president-exploration, Rock Energy, Calgary, Canada. Previously exploration manager, Rock Energy, Calgary, Canada.

Joe Ponthier, to PRMB exploration coordinator, ChevronTexaco China Energy Co., Shekou, China. Previously new ventures team leader, Chevron Australia, Perth.

Denise M. Stone has joined Rose & Associates as director of business development. Stone is a geologist who maintains a role as an independent consultant in Houston.

Enrique Velasquez, to exploration vice president, Ecopetrol S.A., Bogota, Colombia. Previously international exploration manager, Ecopetrol S.A., Bogota, Colombia.

Chris Wickens, to exploration portfolio and development manager, QGC, Brisbane, Australia. Previously team leader unconventional gas, QGC, Brisbane, Australia.

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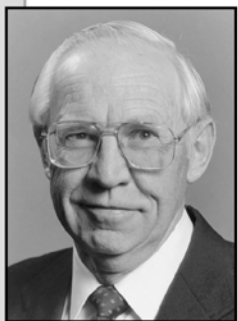
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In my career, I have participated in the Grants-in-Aid Program, offered a number of Continuing Education Courses and Field Seminars, and have been a Distinguished Lecturer on three separate tours, all programs that received financial assistance from the Foundation. The positive influence of the Foundation on these programs is clear.



To give to the AAPG Foundation, go online to <http://foundation.aapg.org/donate.cfm> or mail to P.O. Box 979, Tulsa, OK 74101. Questions? Call 1-888-945-2274 Ext. 644.

WWWUPDATE

Mobile App Draws Traffic at Meeting

By JANET BRISTER, AAPG Website Editor

I just read the wwwUpdate blog and am delighted to report that AAPG membership actually used what they asked us to provide.

Last year at the AAPG Annual Convention and Exhibition in New Orleans, some of you may recall, I brought back the request to provide more information via your mobile phones.

In August at Leadership Days we announced the mobile-enabled information, starting with information

pertinent to that meeting, plus complementing that by selecting a few pages we thought would be quickest to highlight.

To this point the daily news segment has been the most popular, but even counting it our traffic has remained below 100 "hits" a day.

Until now.



ACE opened, and hits on AAPG's mobile website spiked dramatically.

Drum Roll Please

This year we announced there would be information pertinent to the Houston ACE provided on your mobile phone – and as the meeting approached, the traffic began a steady climb.

Then on opening day of the annual meeting the numbers shot up close to 500!

What a rush for Bogdan Michka, AAPG website producer. He has been working on all these additional mobile renderings, and seeing this response was so satisfying he blogged about it on our wwwUpdate blog (at <http://blog.aapg.org/web>).

It turns out that not only were General Information and Technical Program details accessed but Convention-at-a-Glance and Business Committee Meetings were hit as well.

The floor plans and exhibitor lists also were hit (and used!) since people definitely had certain vendors they were looking for while at the meeting.

As I walked through the AAPG Center on the exhibits hall floor, one AAPG staff person commented, "I don't know how I managed past meetings without this," referring to the information provided for this meeting via the mobile phones.

As a result of all this focus, many users found the Daily News and recent EXPLORER articles that are included in our mobile design.

Others, however, decided to glance through the Bookstore features and viewed the ACE YouTube videos.

During the meeting many twitterers were sharing comments and some photos about their experience at the annual meeting.

Were you one of these?

Why don't you take a break from reading this article for a moment and go to the wwwUpdate blog and let us know if you were.

Bogdan's blog post asks for your feedback about your mobile experience while at the annual meeting – so let us know.

You can access it on your mobile phone!

Good browsing!

AAPG-Europe Upcoming Events



Aberdeen Education Week

Date: 9-13 May 2011, Aberdeen Hilton Treetops Hotel

Fee: Members - £200 per day / Non-Members - £245 per day / Students - £30 per day

This educational programme offers its audience the opportunity to hear from highly distinguished speakers in the industry attend workshops, fieldtrips and network with peers and academics. The Education week will focusing on Petroleum Geoscience issues in the subsurface, spotlighting the tools:

Monday 9 May - Drilling

Tuesday 10 May - Petrophysics

Wednesday 11 May - A day out in the field

Thursday 12 May - Seismic

Friday 13 May - Unconventionals Oil and Gas

Contact AAPG Europe for further information or visit the website to register

MAPG - AAPG 2nd International Conference and Exhibition

Date: 5 - 7 October 2011, Marrakech

CALL FOR ABSTRACTS - DEADLINE: 16 MAY 2011

Following the successful first convention in 2007, the Morocco Association of Petroleum Geologists has teamed up with the American Association of Petroleum Geologists to present its 2nd International Convention, Conference and Exhibition.

Exploration activity in North West Africa has gathered pace since the first convention, with acquisition of seismic data and exploration drilling taking place in both onshore and offshore areas. New exploration concepts have been developed as a result of which there have been some notable gas discoveries in Morocco and Mauritania, and exploration activity in this area continues apace.

The sedimentary basins of Northwest Africa are generally under-explored and further potential exists for both conventional and unconventional resources. This convention will cover a wide variety of themes covering, not only Northwest Africa hydrocarbon systems, but also the more global exploration challenges the extractive industry faces.

Join us in Marrakech and learn more about recent exploration activity, new plays and concepts, and the future potential of this fascinating area. The Organising Committee has developed a comprehensive and high quality programme of oral and poster sessions together with an exciting selection of field trips to classic localities. Whether or not you are involved with the geology of Northwest Africa this convention is for you.

Send Abstracts to europe@aapg.org / jabour@onhym.com / gabor.tari@omv.com

<http://europe.aapg.org>

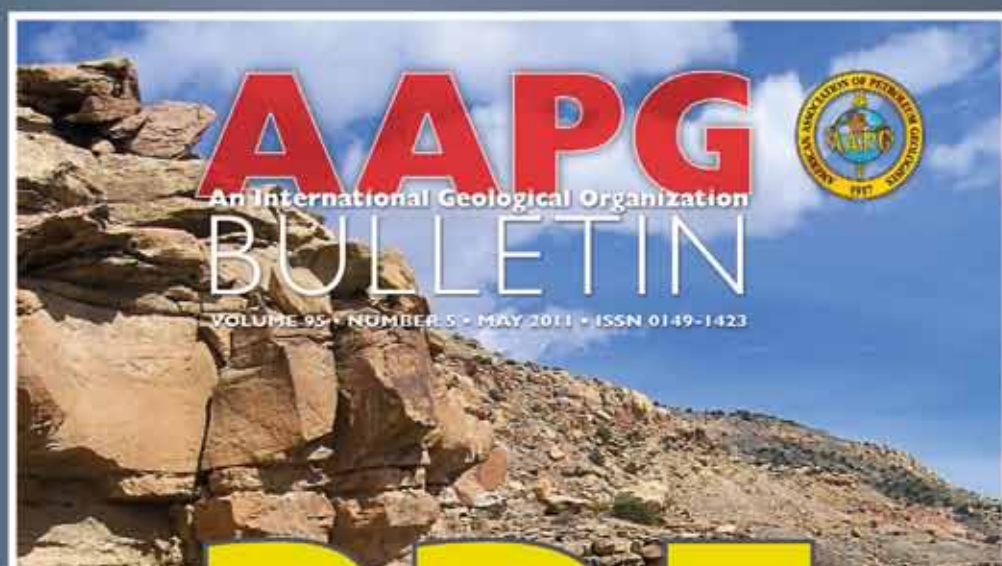
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The AAPG Bulletin is a technical journal that is recognized in the industry as the leading peer-reviewed publication for information on geoscience and the associated technology of the energy industry.

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



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



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

Article highlights include:

Analysis of outcrop analogs

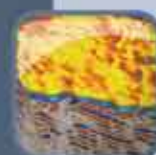
Peter E. K. Deveugle, Matthew D. Jackson, Gary J. Hampson, Michael E. Farrell, Anthony R. Sprague, Jonathan Stewart, and Craig S. Calvert



Outcrops of the Ferron Sandstone Member have been used to build a high-resolution 3D model that captures facies architecture at the scale of parasequences, delta lobes, and facies-association belts. The impact of stratigraphic architecture on recovery has been investigated by simulated waterflooding.

Organic matter lowers permeability

Helge Løseth, Lars Wensaas, and Marita Goding



This study describes seismic expressions of thin-skinned gravitational gliding structures strata bound in organic-rich siliciclastic rocks along the Norwegian Margin. These strata-bound structures may help identify organic-rich intervals in basins where their presence is unknown.

Source rock maturation and hydrocarbon kitchens

Yinhui Zuo, Nansheng Qiu, Yuan Zhang, Cuicui Li, Jianping Li, Yonghua Guo, and Xiangqi Pang



Modeling results of the maturation and hydrocarbon expulsion histories of the Paleogene Shahejie 3 Formation show that it is presently in high mature stage, and that the Bozhong and Qikou sags are the most important kitchens.

Folds trap hydrocarbons in porous reservoirs

Mark A. Pearce, Richard R. Jones, Steven A. F. Smith, and Kenneth J. W. McCaffrey



Fracture spacing distributions of the folds studied from terrestrial laser-scans and RTK-GPS showed an exponential distribution with no significant correlation between fracture density and surface curvature. This result questions the validity of using curvature as a proxy for high brittle strains.

Geoscience Students Benefit from Grants

By NATALIE ADAMS, Foundation Manager

More than 80 grants totaling \$179,000 are being awarded this year from the AAPG Foundation Grants-in-Aid fund, which includes individual named grants that were established by donors and earmarked for specific schools or areas of graduate geological studies.

Most recently, a contribution for this vital fund was provided by AAPG member **James Classen** and his wife, Jacqueline, for the establishment of the Classen Family Named Grant, an annual grant of \$1,000.

Additional funding for Grants-in-Aid also was received from the Pittsburgh Association of Petroleum Geologists. This annual scholarship is \$500 and is restricted to a graduate student attending a school within the Appalachian basin areas and studying Appalachian basin geology.

And speaking of students, the L. Austin Weeks Memorial Undergraduate Grants have been awarded to 44 students and their universities. This award assists undergraduate students and their geosciences department with a \$1,000 grant to each AAPG Student Chapter that meets the requirements found in the AAPG Student Chapter Bylaws and Operations Manual.

This year's recipients can be found in the Foundation advertisement on page 43 of this EXPLORER, and also are posted on the Foundation website at students.aapg.org/chaptergrant.cfm.

Another education-focused segment of the AAPG Foundation is the Digital Products University Subscription Fund. Gifts given to this fund allow donors to contribute a one-

time gift of \$15,000, which provides access for faculty and students at the university of the donor's choice to AAPG's digital library, which currently contains over 111,000 documents of archived geosciences information.

A recent contributor to this fund is AAPG President (and recently named Foundation Trustee Associate) **David Rensink**, who provided a generous gift to fund the University of Minnesota's Digital Products

University Subscription.

To see a list of universities that have endowments, go online to foundation.aapg.org/digital.cfm.

* * *

The Foundation Trustees welcome **James A. Painter**, of Houston, as a new Trustee Associate. Painter who provided a generous donation that is designated to the

E.F. Reid Scouting Fund, which supports programs that teach geology to Boy Scouts, Girl Scouts and other youth organizations as determined by the Trustees of the Foundation.

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

* * *


Contributions made to the AAPG Foundation change lives all over the world. Every dollar given to the AAPG Foundation goes straight into programs and services that directly impact educational and scientific endeavors in the geosciences. You make a difference!

If you are committed to supporting the Foundation's mission through a bequest or other planned gift, please contact the Foundation office at foundation@AAPG.org, or call 1-888-945-2274, ext. 644.

Please make a contribution to help the AAPG Foundation reach the goal. Give online at foundation.aapg.org/donate.cfm, or mail to AAPG Foundation, P.O. Box 979, Tulsa, Okla. 74101.

Credit card donations may be made by calling 1-888-945-2274, ext. 644.

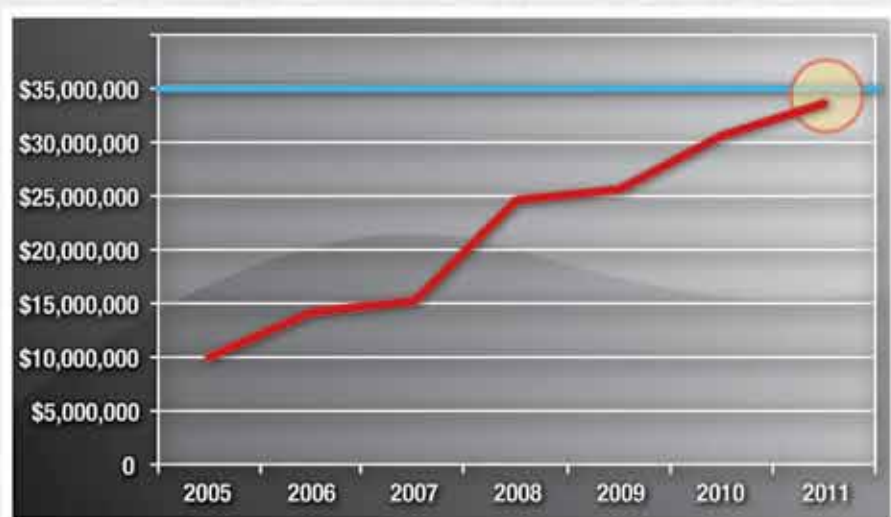
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Finally, many thanks to all of the wonderful donors listed on this page. Without your support, the many programs and services the Foundation provides would not be possible. 

<p>Foundation (General)</p> <p>BP Foundation <i>Matching gift for John S. Isby</i></p> <p>Alfred T. Carleton <i>In memory of A.W. "Bill" Glover, Harry A. Miller Jr. and Charles L. West</i></p> <p>Chevron Humankind <i>Matching gift for Elizabeth A. Johnson</i></p> <p>Travis R. Glauser Andreas Hoie Barbara and Larry Meckel <i>In memory of Mike Lloyd and Norm McIver</i></p> <p>Stephen M. Scott Robert K. Steer <i>In honor of Thomas A. Fitzgerald</i></p> <p>Victor J. Veroda</p>	<p>E.F. Reid Scouting Fund</p> <p>James H. Painter</p>
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Your support of AAPG Foundation programs is important! It reflects your personal commitment to promoting geological programs such as scholarships and grants to university students, K-12 education, distinguished lectures across the world, research, the AAPG Bulletin and much more.

Learn more about how you can make a contribution in support of the program of your choice. The AAPG Foundation is a 501(c)(3) public foundation, qualified to receive contributions in support of worthwhile educational and scientific programs or projects related to the geosciences.

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For more information, go online to foundation.aapg.org, or call 1-888-945-2274 ext. 674.



2011 GIA recipients - Maryam Peyravi, Madani Kivi, Muhammad Awais, Nicholas Holgate, Olena Prykhodchenko, Oluwaseun Fadipe, Rachael Ellen

AAPG FOUNDATION AWARDS

\$179,000 TO GRADUATE STUDENTS

The AAPG Foundation Board of Trustees congratulates 82 students selected as the 2011 Foundation GIA recipients

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- ▶ Curtin University
 - Robert Madden, Sherman A. Wengerd Memorial Grant

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The view from above in Wyoming: There will be much to see and hear at the RMS meeting.

Niobrara in RMS Spotlight

The potential of Wyoming's Niobrara shale play will be in the spotlight during this year's AAPG Rocky Mountain Section meeting, set June 25-29 in Cheyenne, Wyo.

The meeting's theme is "Energy on the Rocks," and while the technical sessions will offer a varied program, the relatively new focus on the Niobrara will be featured.

"We're excited to offer attendees such a rounded program on the Niobrara," said AAPG member Graeme Finley, president of the Wyoming Geological Association. The Niobrara focus will include a field trip, core workshop and a plenary session that offers papers on such topics as:

- ▶ Exploration and development history.
- ▶ Facies and stratigraphy.
- ▶ Models for accumulation and preservation of organic matter.
- ▶ Kerogen type and thermal maturity trends across the Rocky Mountain region.
- ▶ Mapping wireline log properties.

- ▶ Matrix porosity contribution.
- ▶ Laramide tectonics and its impact on fault and fractures development.
- ▶ Fractured reservoirs and EURs.
- ▶ Geomechanics and geomechanical models.

- ▶ Horizontal drilling and stimulation technology.

Also, meeting organizers have planned a public session addressing Niobrara exploration and production concerns, addressing questions on geology, land, water and governmental regulations that surround Niobrara oil and gas development.

Other technical sessions will address:

- ▶ CO₂ EOR and sequestration.
- ▶ EMD sessions on geothermal, uranium and coal.
- ▶ Evaluation of unconventional plays.
- ▶ Rocky Mountain structure.
- ▶ Stratigraphy and sedimentology.

To register or for detailed information, go online to rms-aapg.org/2011_meeting.

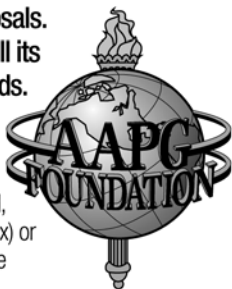
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If you have a funding need that matches the priorities of the AAPG Foundation, please submit to Natalie Adams at nadams@aapg.org. For more information, go to foundation.aapg.org and click on the "Funding" tab.

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

TO CONTRIBUTE

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



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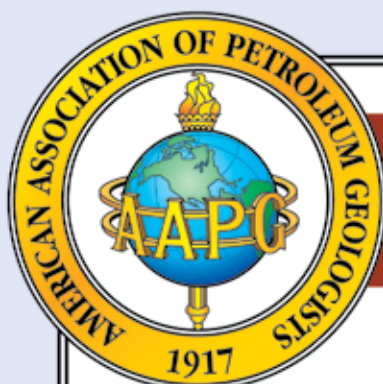


For more information, please contact International Petroleum Technology Conference (IPTC)

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The following **candidates** have submitted applications for membership in the Association and, below, certification by the Division of Professional Affairs. This does not constitute election nor certification, but places the names before the membership at large.

Any information bearing on the qualifications of these candidates should be sent promptly to the Executive Committee, P.O. Box 979, Tulsa, Okla. 74101. Information included here comes from the AAPG membership department.

(Names of sponsors are placed in parentheses. Reinstatements indicated do not require sponsors.)

Membership applications are available at www.aapg.org, or by contacting headquarters in Tulsa.

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Colorado

Twiford, Milo R., Halliburton, Denver (G.S. Sha, J.P. Dumesnil, J.S. Mitchell); Wagner, Karen Lillian Stoner, Vantage Energy, Larkspur (reinstate)

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Means, Guy H., Florida Geological Survey, Tallahassee (S.W. Wise Jr., S.B. Upchurch, J.M. Lloyd)

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Harbert, William, University of Pittsburgh, Canonsburg (C.J. Jump, G.R. Wrightstone, R.M. Burger)

Texas

Aliyev, Kenan, DeGolyer and MacNaughton, Dallas (S.T. Keirstead, D.E. Thomas, C.D. Jenkins); Bailey, Juli A., contract, Houston (J.C. Goss, T.B. Smith, C.E. Cusack); Bartkowiak, Brandon Michael, Shell, Houston (M.T. Cisar, C.L. Beck-Brake, M.K. Davis); Dean, Timothy Craig, Terra Domain Consulting, Aledo (R.M. Slatt, G.W. Roth, S.C. Dixon); Donohue, Catherine Marie, BHP Billiton Petroleum, Houston (B.C. Delph, A.T. Henning, G.E. Stachura); Fredstrom, Michelle Nicole, Shell Exploration and Production, Houston (M.T. Cisar, B.D. Hampton, K.W. Bramlett); Moran, David Rick, Garrison Oil & Gas, San Antonio (H.R. Knox, R.T. Jones, K.R. Helm); Petrizzo, Hilary Elizabeth Strong, Vintage Production California, Houston (J.C. McMahan, S.A. Gordon, D.R. DeFelice); Pogue, Debra Ann, Spring Branch ISD, Houston (reinstate); Rivers, John M., ExxonMobil, Houston (J.A. Simo, J.R. Markello, J.E.E. McGovney); Simon, Christopher Alan, Hess Corp., Houston (L.R. Sternbach, J.E. Jordan Jr., S. Hirsch); Simpson, Kathleen Fernald, Spring Branch ISD, Houston (reinstate); Stagoski, Stephen P., Collarini Associates, Sugar Land (reinstate); Velez, David J., Shell Exploration & Production, Houston (M.K. Davis, M.T. Cisar, T.J. Schickel); Willmore, Charlie, Brigham Exploration, Austin (P.L. Medlock, R.K. Das, E. Radjef)

Australia

Hawke, Peter, Pangaea Resources, Sydney (A.R. Scott, G.S. Drummond, D.S. Hamilton)

Continued on next page

Certification

The following are **candidates** for certification by the Division of Professional Affairs:

Petroleum Geologist

Colorado

Elgerd, Anders O., consultant, Lakewood, Colo. (reinstatement); Berg, William R., AECOM Environment, Fort Collins (American Institute of Professional Geoscientists)

Texas

Leone, John V. Jr., Whiting Oil and Gas Corp., Midland (D. Entzminger, J. Southwell, R. Freidline)

Petroleum Geophysicist

Connecticut

Nolen-Hoeksema, Richard C., e4sciences/Earthworks, Sandy Hook (American Institute of Professional Geoscientists, E. Eslinger, P.M. Harris)

Pennsylvania

Harbert, William, University of Pittsburgh, Pittsburgh (C. Jump, G. Wrightstone, R. Burger)

Texas

Krejci, Albert J. Jr., consultant, Katy (R. Gibson, N. Neidell, D. Tearpock); Rairden, Larry J., Nova Geoscience, Bellaire (Society of Independent Professional Earth Scientists)

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Continued from previous page

Canada

Chopra, Satinder, ARCIS Corp., Calgary (B.A. Hardage, T.B.S. Berge, P.A. MacKay); Langdon, George Stanley, Shoal Point Energy, Toronto (reinstated); Parks, Craig M., Province of New Brunswick, Fredericton (M. McLeod, J. Pol, N.J. Atkinson)

China

Hu, Haiyan, Yangtze University, Jingzhou (R. Pan, F. Hao, T. Jiang)

England

Chaanda, Mohammed Suleiman, Federal University of Petroleum Resources, Plymouth (A.O. Esan, A.R. Ojelabi, O.A. Oke); Naar-Escamilla, Joaquin, BP Exploration, Sunbury-Upon-Thames (G.D. Molina, D.G. Hill, D.H. Samsu)

France

Roy, Jean Pierre, IFP School, Rueil-Malmaison (F.M. Roure, W. Sassi, A. Huc)

India

Das, Pradipta Kumar, Oil and Natural Gas Corp., Dehradun (J.G. Kaldi, S. Kar, B.N. Pradhan); Dubey, Prashant Kumar, Oil and Natural Gas Corp., Mehsana, Gujarat (D.K. Mukhopadhyay, B.P. Ratha, H.S. Bhattacharya); Kumar S., Dinesh, Oil and Natural Gas Corp., Salem (U.B. Chukkasseri, S.S. Nair, N.A. Kumar); Mondal, Tanmoy Chitta, Reliance Industries, Navi Mumbai (S.T. Sinha, M. Choudhuri, N. Sinha); Nagath, Sanjay Kumar, Oil and Natural Gas Corp., Mehsana, Gujarat (P.K. Dubey, B.P. Ratha, N. Vashist); Parashar, Sarvagya, Schlumberger, Mumbai (C. Shrivastva, S.K. Ghosh, D.B. Roy); Rana, Rakesh Roshan, Indian Oil Corp., New Delhi (R.S. Dirghangi, S.S. Negi, A. Chattapadhyay)

Indonesia

Hadi Nugroho, Hadi Nugroho, University of Diponegoro, Semarang (E. Syafron, S.I. Qivayanti, H. Darman)

Italy

Catalano, Raimondo, University of Palermo, Palermo (reinstated); Dalla, Stefano, Eni - E&P Division, San Donato Milanese (M. Orlando, J. Craig, F. Tsikalas)

Netherlands

Kelly, John Edward, Shell International Exploration, Den Haag (H. Darman, B.I. D. Wignall, J.S. Van Der Es)

Nigeria

Akingbade, Kolawole, Shell Petroleum Development, Lagos (G.A. Adewuyi, L. Oaiya, R.A. Afolabi); Akingbade, Oluwakemi Deborah, Shell Nigeria Exploration & Production, Lagos (E.E. Ibide, L. Oaiya, R.A. Afolabi); Akunesiobike, Jonathan Olisaemeka, Shell Petroleum Development, Warri, Delta State (I.T. Preye, E.C. Arochukwu, O.O. Falade); Ibrahim, Andrew Ugbede, Oilworld, Abuji, FCT (A.T. Adelaja, I.J. Ayodele, A.S. Odusina); Mboto, John Sylvester, Chevron, Lagos (J.M. Roth, O. Bakare, T.R. Ajayi); Okereke, Chiedu Samuel, University of Calabar, Nigeria, Calabar (C.O. Ulu, O. Olagundoye, B. Olaleye); Oyebamiji, Ajibola Samuel, Nigerian AGIP Oil Company, Abuja (N. Omorodion, O. Bakare, M.L. Afe)

Russia

Betekhtin, Andrey, Gazpromneft NTC, Tyumen (J.C. Dolson, S.G. Pemberton, S.V. Malysheva); Burova, Larisa, Gazpromneft NTC, Tyumen (J.C. Dolson, S.G. Pemberton, K.W. Shanley); Chukhlantseva, Elena, Gazpromneft NTC, Tyumen (J.C. Dolson, S.G. Pemberton, K.W. Shanley)

Saudi Arabia

Wang, Xuehong, Saudi Aramco, Dhahran (H. Xiao, Y.H. Hu, H.G. Yu)

Scotland

Bamford, Antony Stephen, Geoprobe Drilling, Aberdeen (J.D. Bell, S.D. Harker, J. Richardson); McIntyre, Philip James, Dana Petroleum, Aberdeen (C.J. Percival, M. Kubala, P.H. Griffiths)



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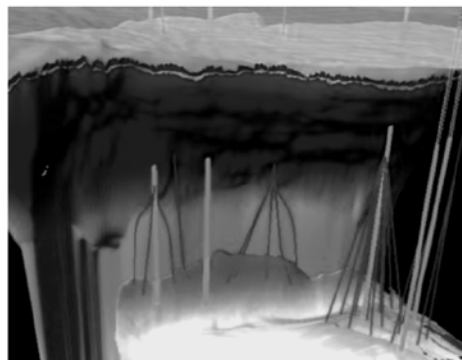
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For Registration and accommodation information please visit :
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Lee and Joanne Billingsley

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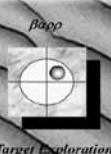
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READERS' FORUM

Watching Washington

Regarding the April Washington Watch column by David Curtiss ("Budget Games: R&D, Tax Breaks in Play"): I hope that you are sending this article to President Obama and Congress.

I have been "assailed" by my congressman about "big oil" tax breaks. Pedantic congressmen and senators, on both sides of the aisle, put out uninformed opinions. They need to learn the whole picture and work together for a long term ENERGY Plan.

AAPG should play a leading role in providing valid information.

Perhaps we should run a "Fact Check" column in the BULLETIN (or New York Times!) on the materials put out by congressional and executive branches of the government.

Paul Henshaw
Clayton, Calif.

What If?

What if, say 10 or 15 years ago, we had drilled in the banned areas, and what if production from ANWR (plus other Alaska areas) was now flowing to market via the Trans Alaska Pipe Line (now flowing at 50 percent capacity due to lack of drilling)?

And what if the long-proposed natural gas pipeline to bring Alaska and Canada's McKenzie Delta natural gas to market was now flowing?

And what if the billions of dollars now being spent subsidizing inefficient and costly alternative fuels (ethanol, wind, solar, etc.) had instead been directed toward supporting conversion of our surface transportation fleet (cars and trucks) from gasoline to compressed natural gas?

And what if the above happened (and it could have) – where would we be today?

Dick Baile
Houston

Geophysical Corner Fan

I'm a fan of Bob Hardage and the Geophysical Corner that runs in each EXPLORER; geophysics, despite the complexities, must be explained by geophysicists like him, who is able to keep it user-friendly and understandable.

Have you ever thought to make the Geophysical Corner published as AAPG volume (CD)?

You can be sure that this would be a bestseller.

Many thanks.

Jean-Marie Mudry
Eysins, Switzerland

(Editor's note: Geophysical Corner columns since 1999 are available in the Explorer Archives area on the AAPG website and also are available by topic in the Special Collections area of Search and Discovery.)

EMD from page 50

in 2011. While occurring principally in eastern and southeastern states, this kind of fuel switching alone helps prop up natural gas demand nationally by a number averaging about one to 1.5 billion cubic feet per day.

A contributing factor has been global escalation of metallurgical and thermal coal prices – not only has gas-fired generation benefited from low prices, but coal generation has incurred a premium.

Current solid fuel markets look a lot like those in 2008, when we experienced the global commodities supercycle.

Looking farther ahead, the impact of unconventional supplies – and especially the growth in reserves and resources of shale gas – can hardly be overstated. Due to their relatively low capital costs and high efficiencies, natural gas in combined cycle applications is the dominant economic benchmark for virtually all electric generation investments, affecting choices across the technology spectrum from wind and solar to nuclear or coal with carbon capture plus sequestration.

Because of compelling economics, commitments to natural gas are growing while wind projects face far worse returns than expected.

A widely accessible barometer of new attitudes toward natural gas is the Energy Information Administration's Annual Energy Outlook, whose 2015 Henry Hub estimate is below \$5/million Btu, and 2020 estimate is a mere \$5.18, or \$1.46 below its prior estimate and \$2.29 below the year before that.

This change in thinking has

tended to track the forward curve, whose decline has been nothing but remarkable, dropping about \$1.50 in the first 10 months of 2010 (about the time that EIA's forecasters are completing their next update).

No doubt these, as all forecasts, will be proven wrong. Major wildcards are the price of natural gas at some new equilibrium and the level of demand (we must keep a close eye on retirements of coal-fired capacity in the intermediate term and on the fate of non-gas options such as nuclear in the long term).

* * *

In the EE&T Committee's annual report, authors review these and additional topics. As principal author, I am indebted to contributions from natural gas industry consultants George Lippman and James T. Jensen, to special consultant Dieter Bieke and to the Electric Power Research Institute.

Results of economic modeling of gas shales are presented with an open invitation to members to provide data-backed analyses that will further our understanding of play economics under varying assumptions. The big-ticket items are the first years of production and the magnitude of drilling and completion costs, affecting both breakeven prices and years to payback.

Oil also makes a huge difference, suggested to improve Eagle Ford economics by an amount equivalent to a \$2 per million Btu increase in the price of natural gas.

Unfortunately, no plays offer the multi-year history provided by the Barnett Shale, meaning much rides on assumptions.

(Editor's note: Platt, an EMD honorary member and past president, is manager of Power & Fuel Supply for Electric Power Research Institute, Palo Alto, Calif.)

Editor's note: "In Memory" listings are based on information received from the AAPG membership department. Age at time of death, when known, is listed. When the member's date of death is unavailable, the person's membership classification and anniversary date are listed. Asterisk denotes AAPG Honorary Member.

IN MEMORY

Richard Kevin Barr, 58
Boerne, Texas, Oct. 15, 2010
Richard L. Beasley, 84
Oklahoma City, March 1, 2011
Mark A. Guinan, 86
Midland, Texas, Dec. 11, 2010
Jasper Laverne Holland, 91
Portland, Ore., March 8, 2011
Harry T. Hunnewell, 84
Graham, Texas, Oct. 21, 2010
John Martin Kelly, 81
Morrison, Colo., Sept. 4, 2010
Edwin Robert Landis, 83
Golden, Colo., Aug. 23, 2010
Harold Julin Morrow, 74
Lafayette, La., Feb. 21, 2011

Uno Nummela, 91
Metairie, La., Oct. 16, 2010
* Max G. Pitcher, 75
Alpine, Utah, Feb. 16, 2011
Jamie Leon Querry, 82
Tonkawa, Okla., Feb 9, 2011
Paul Dewitt See (EM '52)
Seaside, Ore.
H. Warren Shepard, 79
Big Timber, Mont., Dec. 11, 2010
Paul Gerald Wagner, 75
Bakersfield, Calif., Oct. 31, 2010
Nelson E. Webernick, 87
Midland, Texas, May 10, 2010
Charles Lynn West, 87
Midland, Texas, March 4, 2011

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Application process: Applicants must provide 1) Application Form (the designated form is on the website); 2) curriculum vitae that details research experience and interests; 3) a list of publications; 4) the names and contact information of four references. All materials must be submitted in English.

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Application Deadline: 17:00(Japan Time), June 8th (WED), 2011; Interviews may take place prior to the closing date; however, no final decisions will be made until after this time.

Applications should be submitted to: send the attachment files to the e-mail address below
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- » **The Drake Well and Unintended Consequences**, William R. Brice
- » **Columbia Farm of The Oil Creek Valley, Oil Creek State Park, Venango County, Pennsylvania: 150 Years of Petroleum History and Counting**, Amy Randolph
- » **Oil Creek Valley, Pennsylvania – Then & Now**, John Harper
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American Association of Petroleum Geologists
EXECUTIVE DIRECTOR

The American Association of Petroleum Geologists and the American Association of Petroleum Geologists Foundation are searching for an individual for the office of Executive Director for both of those organizations.

The Executive Director of AAPG is the chief administrative official of AAPG, and is in charge of the Association headquarters and staff personnel (more than 70 people), as authorized by the AAPG Executive Committee. The Executive Director of the AAPG Foundation is the chief administrative official of the AAPG Foundation, reports to the Foundation Trustees, and works to maximize donor participation, fund growth and assure appropriate and strategic allocation of Foundation assets.

To be considered for the position, a candidate must have: excellent communication skills (oral and written), industry management experience, strong interpersonal skills, executive experience managing collaboratively with internal and external committees and multicultural project teams, directing organization resources to achieving both immediate and strategic objectives, a proven success as a fundraiser, proven success in working effectively in a non-profit organization environment (especially in trade or professional organizations), experience in dealing with non-profit organization boards of directors, an international perspective on issues facing AAPG, experience in global travel and in dealing with international customs and relationships, and a reputation as an original thinker.

Preference will be given to those applicants who have at least a bachelor's degree in geosciences, and have worked as professional geologists. Successful candidate must be willing to relocate to Tulsa.

Candidates should submit a resume, names of three references, and a personal statement to searchcommittee@aapg.org.

A Productive Past, a Bright Future

By RICK FRITZ, AAPG Executive Director

During spring break I took my son, Ian, and his friend skiing in Angel Fire, N.M., and Ian realized five days after he returned that he had lost his credit card.

I immediately got online and checked the account and there were some unauthorized uses of the card.

I started to cancel the card, but then I realized that whoever had the card was spending less than Ian – so I decided to let it go for a while.

* * *

Sometimes the status quo is good and sometimes it isn't.

When we started working together almost 12 years ago it was clear AAPG was on the edge of a major growth spurt. All the members and staff needed was opportunity.

I have worked with many great leaders during my tenure – from AAPG presidents to committee chairs to student activists, and also the AAPG staff leaders. It has been a privilege to work as a team through these many years.

As Homer said, "Light is a task where many share it." This has certainly been the case during my time as AAPG executive director.

As a result we have significantly expanded our programs and operations around the globe with many new programs for the AAPG membership and non-members as well. It has been great working with members and staff to develop and expand AAPG's digital services, workshops and conferences, and the



Rick Fritz, AAPG's executive director for nearly 12 years, is heading to new frontiers.

Washington and regional offices.

That is all I am going to say about the programs – my feeling is, they speak for themselves. I also hope you have enjoyed their development as much as we have.

* * *

Now for the future: I feel that AAPG is once again poised for a great expansion. As the Ghostbusters famously said, "We've got the time, we've got the talent."

I am proudest of the staff we developed and their dedicated service to the membership. As I am fond of saying, we

have close to the same number of staff we started with in 1999 but we have nearly doubled the number of programs and services. They are a great staff.

In addition, thanks to the generosity of our membership we have the resources to grow. As announced at the annual meeting, the AAPG Foundation has received more than \$28 million in endowments from individuals and nearly \$6 million in donations and pledges from industry.

When the staff and financial assets are combined with the ingenuity of the membership, the Association has the opportunity to bring the best science

and professional development to the geoscientists and industry professionals of the world.

* * *

My nearly 100-year-old grandma was fond of saying, "Always leave before you wear out your welcome." I always try to do what she said.

I appreciate all of the thanks and congratulations I have received from members. Now that I am leaving I am mostly thankful – thankful to the AAPG leadership who taught me so much, thankful to the staff who gave me the power to lead and thankful to the people I met around the world who gave me perspective.

I'm most thankful to my family, who gave me the strength and time to work and travel. Mary has been very supportive, and Ian and Zoe have allowed me to tell their stories and add a little color and emphasis into my speeches and writings (Ian really does not spend a lot!)

Confucius said, "Choose a job you love, and you will never have to work a day in your life." I have loved working for you and now look forward to going back to my first love – geology and prospecting.

I hope to see you again as a member-volunteer for AAPG.

Rick

DIVISIONS' REPORT

No end of surprises

Adapting to Lower Cost Natural Gas

By JEREMY PLATT, Chair, EMD Energy Economics and Technology Committee

EMD's Energy Economics and Technology Committee is a resource center for individuals with interests in business, planning and forecasting aspects of the energy industries.

While oil has long been a dominant agent in global and national economies – particularly at \$100 per barrel – natural gas is the most important fuel to changes taking place in the energy economy.

These changes are greater than anyone could have imagined and are far reaching.

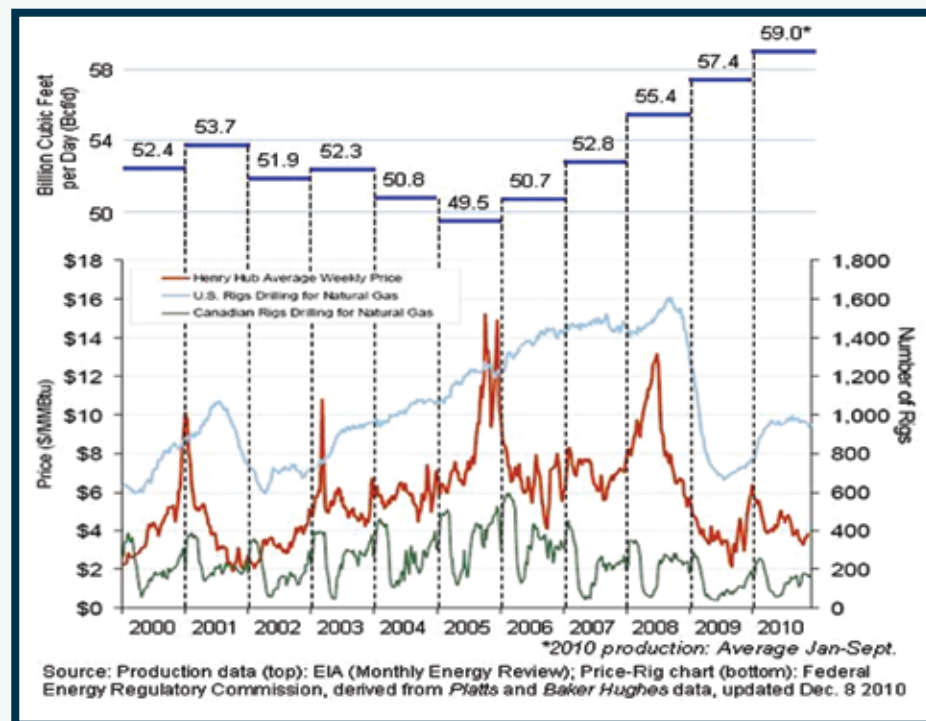


PLATT

* * *

Among producers, necessity (i.e., how to survive with low natural gas prices) has been the mother of financial invention, and particularly of joint venture financial arrangements bringing money into development and production.

In a perverse manner, this kind of financing decouples production (up) from prices (down), exacerbating the



The gas-directed rig count from 2000 to 2006 experienced an initial spurt followed by sustained increases. Production generally declined and LNG was widely expected to serve as the only major source of incremental supply until Arctic gas pipelines were completed. Since 2008, both prices and rig counts collapsed while annual production has grown 1.5 to 2.0 billion cubic feet per day. Financial arrangements, horizontal drilling and other procedures in core regions have improved productivity while leasing terms (to hold leases by production) have sustained drilling under falling prices. During 2010, a shift in the mix to oil-rich plays also has contributed to co-product oil and gas production, stabilizing the level of drilling even as prices continued to decline.

prices. Although good for consumers, these deteriorate power generators' balance sheets just when economic recovery is improving sales.

Most unusual in that sector, however, is the flip-flop in cost competitiveness of coal and gas-fired generation. Displacement of coal by gas broke all historic records through most of 2009. It quite likely exceeded those records last year and may reach even greater heights

oversupply that forced creative steps in the first place. These divergent paths are summarized in the accompanying chart.

Related inventions are the unheard-of concepts of exporting LNG or even

entertaining gas to liquids, both possible means to "monetize" shale production.

Among buyers of natural gas, particularly the power industry, low gas prices have translated into low electricity

See EMD, page 48

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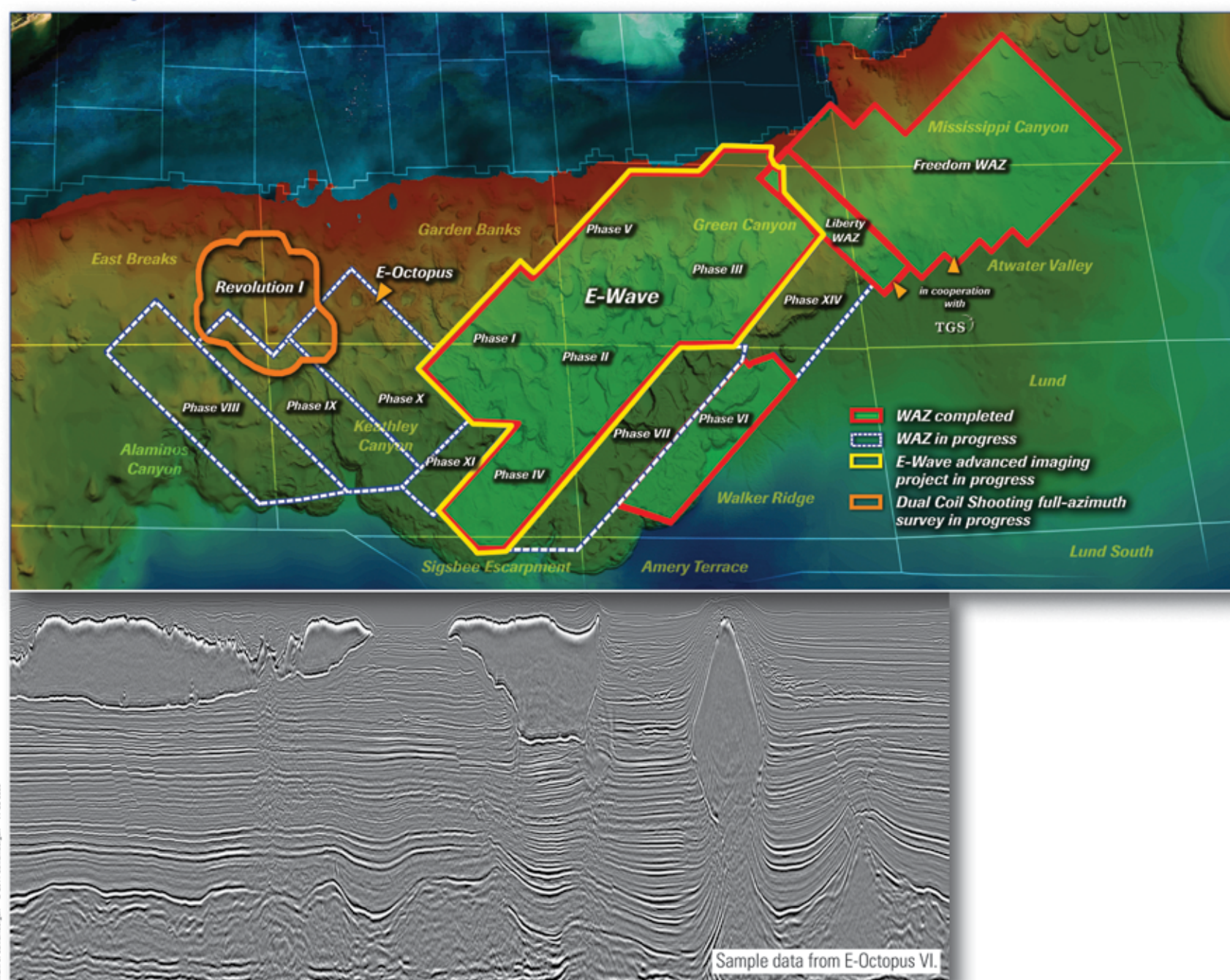


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