Treasure Hunt
Are these clues to exploration success?
See page 8
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Critical Thinking

By JOHN C. LORENZ

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students increasingly are learning via computers, and scientists are increasingly dependent on them. Computers allow us to work numerous problems quickly and accurately. However, like my new wife of many happy years, tells me the cautionary tale of her 10-year-old students who have discovered that they “solve” classroom problems only by being looked over quickly through all the answers until they stumble onto the correct one. Give them credit for superficial smarts, but they are obtaining answers without understanding, and circumventing valuable learning. Unfortunately, some teachers let the students get away with this because it’s easier and, after all, the answers are correct. And before we get into the school systems, the same problem exists with that of today’s mandatory corporate training.

One wonders that scientists have also discovered this trick, using computers to obtain answers instead of understanding. Although there is plenty of room for critical thinking when using a computer, that step is sometimes omitted and no one seems to notice. Computers can provide strong support for both learning and scientific processes, but they can also be used to replace them. I stumbled into eminent AAPG member J. Nolan Wesson on the exhibit floor of NAPE recently, and amid the amazing array of booths selling answers we agreed that modelers still need to know which numbers to crunch and how to carefully assess the meaning of those numbers.

Larry Nation, AAPG communications director, found the accompanying chart that seems to show a strong correlation between rock music and oil production. Technically one could conclude from this that the way to reverse the production decline in the United States is to write more good rock ‘n’ roll music, a solution to the world’s energy problems with appeal at many levels. However, a critical assessment of the graph should suggest that there is probably no relationship between factual production data and subjective opinions on songs. If the correlation itself is merely serendipitous, then conclusions derived from it are spurious.

One of the most pervasive stories in the CPI is the need for multiple and diverse sources before taking sides in an issue. And while the oil & gas industry provides numerous funds for science and educational endeavors, the process of understanding and evaluating the information from multiple and diverse sources before taking sides in an issue. And while the oil & gas industry provides numerous funds for science and educational endeavors, the process of understanding and evaluating the information from multiple and diverse sources before taking sides in an issue. And while the oil & gas industry provides numerous funds for science and educational endeavors, the process of understanding and evaluating the information from multiple and diverse sources before taking sides in an issue.
President from previous page

Pseudo-scientific yet popular apocalyptic geological reinterpretations “Worlds in Collision” and “Earth in Upheaval”. These works had a veneer of authenticity and were accepted by many when they were originally written half a century ago, but the scientific community critically assessed them as lacking and they have been largely forgotten.

On the other hand, using more scientific processes, some non-geologists have made significant contributions to geology and their theories have withstood critical scientific assessment to become part of our scientific foundation. Consider Alfred Wegener, the meteorologist, and his ideas of continental drift, or Luis Alvarez, an experimental physicist, whose theories of planetary impacts revolutionized not only the geological record but also many concepts of evolution.

One of the differences between Alvarez and Velikovsky is that the first used defensible data synthesized into a plausible and testable theory whereas the other picked isolated facts out of context to spin a story. The more scientific approach of Alvarez is not immediately apparent to the non-critical thinker who looks only at an author’s conclusions. Critical thinking requires listening to and assessing, but not necessarily accepting, opposing views. It requires the give and take of discussion, not just stone-wall contradiction. The difference between discussion and contradiction is humorously illustrated in Monty Python’s “Argument” sketch (http://vids.myspace.com/index.cfm?fuseaction=vids.individual&vid=3284452). There is much truth in humor. If someone believes too much in their side of an argument to laugh about it, be cautious. Likewise, learn to ask questions and beware of someone who doesn’t consider them seriously.

Aapg member and Piceance basin expert Steve Cumella notes that science would be stagnant if we all agreed on the issues and answers.

Other rules of thumb for the critical thinker include instant caution flags whenever someone throws the term “obviously” into a discussion. A critical thinker gets information from multiple and diverse sources before taking sides in an issue. One should consider not only someone’s conclusions but also the logic and data that were used to come to those conclusions. Does the expert have personal experience in the area or is the argument theoretical? Calibrate your sources. Peer-reviewed literature is not infallible but it tends to be more reliable than not. Websites can be anyone’s guess. Recognize that just because a person has a Ph.D. doesn’t make them experts in all fields, or even in their own.

Consider also whether a person drawing specific conclusions might have another, less apparent agenda that would be served by those conclusions.

Many pressing issues in today’s world would benefit from thoughtful reflection by geologists. We have a wide range of opportunity for exercising critical thinking in our science, and the numerous AAPG venues provide a wealth of data to assist critical thought.

* * *

This is my last opportunity as president to inflict a view of the world onto the AAPG membership. One year goes by quickly, that’s either good in that it limits the opportunities to do damage, or bad because a year is not nearly enough time to effect significant change. Regardless, It has been an honor. My sincere thanks to Gretchen Gillis and Liz Lorenz who have edited these columns and kept me from making egregious errors.
I loaded all the offshore Norway data in 35 seconds.

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Petroleum System Summary of Brazilian Offshore Basins

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Conjugate Margins Are (Again) in the Spotlight

By SUSAN R. EATON, EXPLORER Correspondent

A comprehensive, multi-year geological study of the vital conjugate margins of the Atlantic Ocean continues this fall – this time in a spectacularly beautiful setting.

The second Central and North Atlantic Conjugate Margins Conference – co-sponsored by AAPG and AAPG’s European Region, among others – will be held Sept. 29-Oct. 1 in Lisbon, Portugal.

Supplementing the science will be a unique opportunity for some hands-on experience.

In addition to participating in a three-day technical conference, short courses and a core workshop, attendees will have the opportunity to view some of Portugal’s spectacular geological outcrops – rocks brought to the surface through a structural inversion – whose deeply buried analogs produce oil and gas in offshore Newfoundland.

In the Lusitanian Basin, for example, geologists will be able to touch Jurassic age salt diapirs that have pierced through overlying sediments, dragging them upwards and creating textbook-style traps for oil and gas.

Used in conjunction with seismic data and wireline logs, Portugal’s outcrops illustrate the geodynamic and tectono-sedimentary history related to the opening and closing of the Atlantic and Tethys Oceans, respectively.

“The study of Portugal’s outcropping stratigraphy, salt tectonics and associated oil shows allows a better understanding of the petroleum systems of the basin, and provides a better prediction of what may be expected in the deep offshore where intense exploration is going on at the moment,” said AAPG member Nuno Pimentel, co-chair of Lisbon 2010.

According to Pimentel, an assistant professor of geology at the University of Lisbon, most of the dozens of wells drilled offshore have targeted Portugal’s diapiric structures.

Although unsuccessful, many of the wells contained oil shows.

“Understanding the evolution of the Central and North Atlantic conjugate margins,” Pimentel said, “is essential to defining the petroleum systems and the oil and gas potential of these promising regions.”

Lisbon 2010’s theme, “Rediscovering the Atlantic: New Winds for an Old Sea,” has been designed to enhance the E&P industry’s knowledge – and opportunities – in these passive margin basins.

“The oil and gas potential of Portugal’s conjugate margin is virtually unexplored,” Pimentel said. “Yet, we’re facing Newfoundland and Nova Scotia, so why not?”

“We hope this conference will contribute to putting Portugal on the map of the oil and gas basins of the North Atlantic.”

Building On Success

Although steeped in a long E&P history, Portugal’s oil and gas industry is still in its infancy. During the 20th century, 50 wells were drilled onshore and a dozen offshore (primarily in the 1970s, in waters less than 200 meters), yielding several oil and gas shows but no commercial discoveries.

A recent regional multi-client seismic data program in Portugal’s deep waters, however, precipitated a renewed interest in Portugal’s offshore, leading to the signing of several exploration concessions.

Lisbon 2010 will provide an international forum for researchers and industry to share geoscience knowledge focusing on the Central and North Atlantic passive margins via sessions built on three themes:

- Evolution of Atlantic Margins.
- Atlantic Petroleum Systems.
- Atlantic Margins E&P.

Two-day short courses will be offered by internationally renowned specialists Octavian Caluñearu (University of Alberta, Canada), who will present sequence stratigraphy and its application to petroleum exploration and production, and Mateu Esteban (Carbonates International, Spain), who will present a multi-scale approach to understanding carbonate reservoirs and related play types.

A post-conference field trip will head to Morocco to study Triassic to Cretaceous age outcrops of the Agadir and Essaouira basins – including some equivalents to the oil and gas producing reservoirs in offshore Nova Scotia.

Lisbon 2010 will be building on the successes and momentum of two previous conjugate margin conferences co-sponsored by AAPG – a 2007 meeting in Marrakesh, Morocco and a 2008 session in Halifax, Nova Scotia (see January 2008 EXPLORER).

Highly successful, the Halifax “Central Atlantic Conjugate Margins Conference” boasted over 200 delegates from 17 nations, representing 48 companies and 26 government and academic institutions. More than 90 technical oral and poster papers were presented.

Dave Brown, the Halifax co-chair, was pleased to pass the baton across the Atlantic to Pimentel and Rui Pena dos Reis, the co-chairs of Lisbon 2010.

“A regional and thematically-focused conference benefits from the continuity of meeting on a scheduled basis,” said Brown, an AAPG member and senior geologist with the Canada-Nova Scotia Offshore Petroleum Board. “Coming together every two to three years provides a reasonable period to collect new data and to develop new ideas, encouraging collaboration and facilitating joint projects and initiatives.

“Interestingly, exploration on opposing conjugate basins is imbalanced,” Brown added. “Relatively speaking, there are a greater number of wells, seismic, discoveries and fields on the Brazilian, Nova Scotian and Newfoundland margins than their conjugates in Angola, Morocco and Ireland, respectively.

“There are a number of varied reasons for this,” he said, “many of which are not geological.”

Jurassic Parkway?

Michael Enachescu, one of Lisbon 2010’s keynote speakers, will deliver an address on “Late Jurassic Source Rock Super-Highway on Conjugate Margins of the North and Central Atlantic (offshore East Coast Canada, Ireland, Portugal, Spain and Morocco).” Mapping the distribution of the Kimmeridgian-age source rock, Enachescu said, is the key to exploration success in the Atlantic passive margins.

“Find me the pre-fift, intra-continental system that was filled, from time to time, with a Jurassic sea,” he said. “Map it, determine whether it survived and whether it’s mature.”

Enachescu, an AAPG member, is the chief geophysicist at Calgary-based MEG Energy Corporation, and an adjunct professor at Memorial University’s Department of Earth Sciences in St. John’s, Newfoundland.

Continued on next page
The Bond Remains Strong

By SUSAN R. EATON, EXPLORER Correspondent

Situated on opposite sides of the Atlantic Ocean, Portugal and Brazil are connected by more than 500 years of a common history, culture and language.

The two nations also are connected by a common economic interest in the oil and gas potential of their respective continental margins. Just as the Old World transported its culture and traditions to Brazil, today’s New World Brazilian geologists travel to Portugal to study the evolution of the Central Atlantic’s conjugate margin, a tectonic history illustrated by spectacular outcrops, ranging in age from Triassic to Cretaceous.

For several years, Nuno Pimentel and Pena dos Reis have led geological field trips for Petrobras, Brazil’s state oil company, using Portugal’s Lusitanian Basin outcrops as their Old World analogs. Portugal’s “Natural Oil Triangle,” AAPG member Pimentel said, lies between two giants: Brazil and Angola. All three countries are linked by a common history, culture and language.

“There is a strong feeling of friendship between Brazil and Portugal,” said AAPG member Mario Carminatti, Petrobras’ executive manager of exploration. “The two countries feel like two close friends who have been separated for a while. In our case, the separation distance is defined exactly by the formation of the Atlantic Ocean and its marginal basins!”

“Even though the timing and the details of Portuguese conjugate basins differ from those in Brazil,” Carminatti added, “the general process of formation of marginal basins shares many similarities.”

Buoyed by offshore exploration successes in Brazil’s conjugate margin—the Tupi field with eight billion barrels of oil equivalent in place—and encouraged by similar geological histories and mechanisms in the Lusitanian Basin, Petrobras recently picked up offshore exploration licenses in Portugal with commitments ranging from 2-D and 3-D seismic data acquisition to the drilling of exploratory wells.

“We consider these licenses as an important new frontier to be explored in the coming years,” Carminatti said. “In spite of the natural geological risks, we consider that the prospectivity of these areas presents an enormous potential to be assessed.”

“Portugal discovered Brazil 500 years ago, and now Brazil is helping Portugal discover oil in the 21st century,” Pimentel said.

Recognizing significant value in these intimate, trans-Atlantic conjugate margin conferences, Petrobras sponsored Halifax 2008 and is a Diamond sponsor for Lisbon 2010. According to Carminatti, the conference format—there are no concurrent sessions, so attendees don’t have to choose between talks—provides excellent opportunities to meet the top specialists on the studies of continental break-up, basin formation and ocean spreading, both from academia and oil companies.

“It’s like having a crash course on some of the hottest topics in marginal basins with the best specialists, in person!”
As was hot. Now it's not. Whiplash, anyone?
Owing to the past couple of years when highly productive shale gas plays have sprouted like weeds in myriad locales in the United States, essentially in sync with cratering demand, oil is king— for now.

Given the current oil-gas price differential hovering around 15:1 or more, it comes as no surprise that a number of E&P folks, principally independents, are moving at near warp speed to stake their claim in oil plays, particularly oil shales and those rich in NGLs.

Meanwhile, some of the Big Guys, e.g., ExxonMobil, BP, Total and others, have bought into the shale gas plays via joint ventures and acquisitions, with the long term in mind.

In addition to these deals, some of the independents’ positions in shale gas have begun to pay off, so these trailblazers in commercial shale gas have cash on hand to dig into something currently more lucrative.

This is good news for the Rocky Mountain region, which has been pummeled by low prices and sinking demand for natural gas. There’s oil in them there hills.

For example, operators have been working diligently the past couple of years to successfully wrest oil from the high profile Upper Devonian-Lower Mississippian Bakken shale play in Montana and North Dakota.

According to a U.S. Geological Survey assessment, the Bakken harbors an estimated 3.65 billion barrels of undiscovered, technically recoverable oil, 1.85 Tcf of associated/dissolved natural gas and 148 mbo of natural gas liquids.

Early attempts to produce the Bakken economically were an exercise in frustration for the operators, and it was usually looked on as a bailout zone. AAPG member and 2006 Explorer of the Year Dick Findley is credited with cracking the code for the Bakken in 1995, ultimately leading to development of the giant Elm Coulee Field in the Bakken in eastern Montana.

Today, the prolific Bakken has some respectable competition.

For example, the underlying Three Forks formation—which now is considered to be separate from the Bakken—reportedly may contain as much recoverable oil as the Bakken, which has more oil overall.

The North Dakota Department of

Mineral Resources has released more conservative numbers than the USGS estimate. It reportedly credits the Bakken with a mere two billion barrels recoverable, but also forecasts two billion as well for the Three Forks, which contains about one-eighth the total oil of the Bakken.

Niobrara Potential

Higher up the geologic section in the Cretaceous, there’s apparently a mother lode just waiting to be seriously exploited.

“When you ask what’s happening in the Rockies, the answer is oil shale plays,” said Denver-based AAPG member Randy Ray, “and the hot topic is the Niobrara.

“The Niobrara is part of the Cretaceous seaway that covered the whole middle of the U.S.” Ray noted. “We’ve had cycle after cycle of exploration for Niobrara fractures, mainly oil but some gas where it’s buried deeper.

See Rockies, page 24
Sierra Leone and Liberia

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Shale Gas Success Echoes Through Rockies

By LOUISE S. DURHAM, EXPLORER Correspondent

How strange to think it was not so long ago that North American gas supplies were tight and prices, while volatile, were hovering around $13/Mcf. Then along came the now ubiquitous shale gas plays with their reported copious reserves and high volume IPs, accompanied by the worst recession since the 1930s and . . . BANG. The ensuing decreased demand and increased production sent an all-time record 3,653 Bcf into storage by mid-November 2009, according to Steve Trammel, senior product manager at IHS in Denver. He noted average U.S. spot gas price throughout 2009 was $3.96/Mcf and says to expect soft gas market conditions through most of 2010. It’s a particularly tough scene in the Rockies, where unconventional gas plays face stiff competition from the high volume, lower cost shale gas wells in other parts of the country.

The Marcellus and Haynesville and some others are such high volume gas plays and producing so much gas,” Trammel noted. “The Rockies wells producing maybe 3 MMcf a day have a hard time competing with IPs of 13 to 15 MMcf.”

It doesn’t help that Rockies gas is the lowest priced gas in the United States. In fact, the producers will be challenged to reduce costs to prevail with sub-$5 gas and continuing negative basis differentials during the coming year, according to Trammel. Energy policy access restrictions and new rules contribute their share of negative impact on cost.

The Rockies plays, for the most part, produce cleaner gas – in fact, the region yields 36 percent of total U.S. dry gas production, compared to 29 percent five years ago, according to information from EERC.

Dry gas is not a good thing today. “When you have an oil-gas price differential of 15 to 1, or 20 to 1, people are leaving gas plays and going strictly to liquids and also to shale gas plays with NGLs associated with them,” Trammel said. “The NGLs makes the economics wonderful.”

“Lots of shale plays, especially the Marcellus and Eagle Ford, have liquids associated with them,” he noted. “A good example of someone moving off to chase oil and liquids is Pioneer (Natural Resources),” Trammel said. They had a huge operation in the Raton Basin for coalbed and were going to drill the Piney shale – now they’ve pretty much shut down a lot of that and gone to the West Texas Permian drilling for Spraberry oil.

“They just moved out of the Rockies for the time being,” he said.

In the quest for cost improvement, Rockies players are applying technology such as pad drilling. This yields a smaller environmental footprint and enables the operator to move a 16-for-purpose rig onto the pad and drill a number of wells from it and then bring in the completion rig to complete all of them. As for the thorny issue of demand, the best potential for gas demand growth for the Rockies lies in the power sector, according to Trammel. But the West is a coal-rich region, and much of the power hasn’t been switched over to gas yet, so there’s work to be done there.”

Positive Signs

But don’t despair – all is not gloom and doom. Trammel noted there are a number of plays that are still competitive, including:

- Pinedale-Jonah in southwest Wyoming, where drilling and completion costs are under control. A number of wells have been drilled there over many years – and the higher volume wells kick out as much as 5 MMcf/d.
- Exxon/Mobil operations in the Piceance remain competitive, aided by considerable pad drilling.
- The big Wattenburg gas field near Denver in the DJ Basin, with its NGLs, continues to rock ’n’ roll successfully.
- Coalbed is important in the Rockies and marginally competitive. By and large, these are lower volume wells with higher cost because of de-watering and disposal of the water before the wells can come on.

“The great irony is in the innovative work.

See Shale Gas, page 18
ON THE HORIZON//

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Balancing oil AND gas activities

Activity Begins on Utah’s Shale Gas Potential

By LOUISE S. DURHAM, EXPLORER Correspondent

Considering that natural gas prices are at bargain basement levels and storage facilities are brimful, it would be easy to assume natural gas exploration is headed for a major hiatus.

Think again. The always-optimistic explorers continue efforts to find new supplies that will be needed when demand once again soars, triggering prices to move upward and storage levels to decline.

Utah is one of many areas where the drill bits are turning to tap into more gas, yet not ignoring oil.

“Most of the drilling activity in Utah is in the Uinta Basin, especially the eastern area, for Cretaceous Mesaverde and Tertiary Wasatch tight gas sands,” said AAPG member Tom Chidsey, petroleum section chief at the Utah Geological Survey (UGS).

“Tertiary Green River oil is the drilling target in the Monument Butte/Brundage Canyon area in the west-central part of the basin,” Chidsey continued, “and there’s activity in the Ninemile Canyon trend involving Tertiary, Cretaceous and older targets in the southern Uinta.

“The Mississippian Manning Canyon Shale, Soldier Canyon, Oquirrh Mountain, northern Utah, are some of the plays that are being worked.”

Shale Gas Potential

If it’s shale gas that presses your buttons, not too worry – Utah has that too.

If you’re not up to speed on the geological characteristics of the shale resources, there soon will be new info available, at least in two promising areas. “The Survey is involved in two shale gas projects funded by the Research Partnership to Secure Energy for America,” Chidsey said.

“We just got funded for the second one, which is the Cretaceous Mancos Shale in the Uinta Basin area,” he said. “The other is emerging Paleozoic shale gas resources of the Colorado Plateau in central and southeast Utah.”

The good news is the results of the two projects will be available to all. Shale gas reservoirs in Utah have tremendous untapped frontier potential, according to Chidsey. For example, he noted that existing gas production in the Uinta Basin could be greatly enhanced by the addition of gas reserves in the Mancos Shale.

In line with a number of emerging shale gas plays, the geologic and engineering insights for the Mancos are preliminary in nature.

See Utah, page 16
The difference between raw data and refined information?

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ihs.com/refined-information/aapg
Utah from page 14

In order to quantify these plays, however, accurate geologic and geophysical characterization must be integrated with reservoir specific engineering practices.

To achieve this, Chidsey noted the Mancos project will:

- Characterize the geology – including sedimentology, stratigraphy, organic, stable isotope and inorganic chemistry, natural fracture analysis, geophysical and 3-D seismic analysis – of the Mancos in the Uinta. The goal is to ID premium target zones and determine the resource potential.
- Define the geologic parameters that determine various geo-mechanical properties, i.e., brittleness and susceptibility to fracturing. Employ defined relevant geologic parameters to predict brittle areas along with Mancos shale gas prospectively, from an engineering standpoint.
- Establish best drilling, completion and production techniques for specific target intervals, based on rock properties.

“The investigation will quantify and potentially lower the economic risk of exploration and development in the Mancos shale gas play,” Chidsey said, "encouraging larger scale commercial production.”

Project team members represent:  
- The Utah Geological Survey.
- Halliburton Energy Services.  
- Chidsey noted that Questar E&P, Gasco Energy, Newfield, Wind River Resources and Pioneer Natural Resources will donate data. Many other Uinta Basin gas producers will participate as Advisory Board members, with some of these contributing data.

Unknowns and Objectives

In the Colorado Plateau and eastern Basin and Range provinces, Paleozoic shales are long recognized for their potential as source rocks for hydrocarbons that have migrated into other formations. Yet the shales haven’t been looked on as in-situ gas reservoirs, according to Chidsey.

These include the Manning Canyon/Doughnut and Delle Phosphatic shales of Mississippian age in north-central and western Utah, respectively, and the Pennsylvania Paradox formation in the Paradox Basin in the southeastern part of the state.

“Shale beds within these formations are widespread, thick, buried deep enough to generate dry gas and contain sufficient organic material and fractures to hold significant recoverable gas reserves,” Chidsey noted.

“Exploratory efforts are just beginning to target these frontier gas shales – many in environmentally sensitive areas,” he added.

There are many unknowns about these shales, including the basic rock mechanics. The distribution and thickness of the rocks are inadequately mapped, and the vertical succession and regional correlation of the Manning Canyon and Delle Phosphatic hasn’t been interpreted in a sequence stratigraphic framework.

Chidsey itemized the overall objectives and/or benefits of the current study:
- Identify and map the major trends for target shale intervals and identify sweet spots with the greatest gas potential.
- Characterize the geologic, geochemical and petrophysical rock properties of those reservoirs.
- Reduce exploration costs and drilling risk – especially in environmentally sensitive areas.
- Recommend best practices to complete and stimulate these frontier gas shales to reduce development costs and maximize gas recovery.

All project maps, data reports and results will be publicly available and provided to both small and large operators via a proven technology transfer plan, according to Chidsey.
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Wyoming’s Website Wows Explorationists

By BARRY FRIEDMAN, EXPLORER Correspondent

Wyoming has a number of firsts going for it: the first state that gave women the right to vote, for example, and the first to have a national park and monument (Yellowstone and Devil’s Tower respectively). But in at least one instance, being second is still a pretty good thing—the state is second only to Texas when it comes to the marketing of natural gas. In fact, it produces as much as the Gulf of Mexico.

That’s the kind of message you want to get out. And behind every successful petroleum exploration-driven state, you might say, lies (or should I say) a successful, vibrant state geological website.

According to proponents, www.wogcc.state.wy.us is the first stop for any professional, be it private or public, who wants or needs to find out more about what goes on in Wyoming.

The website, says AAPG member Fred Crockett, BLM/Wyoming Reservoir Management Group, “is a powerful source of information for all and gas companies and consultants.”

He’s not alone in his praise. According to the Interstate Oil and Gas Compact Commission, Wyoming has one of the country’s most advanced and interactive web-based reporting systems.

The site offers Wyoming well coordinates, production data, permit approvals and formation tops. Also, there are links to outside information, including federal leasing data from the Bureau of Land Management and programs, mapping ability from the University of Wyoming and tax information.

“The WOGCC website is my primary source of data for working Wyoming,” says AAPG member Lynette D.W. George, a consulting geologist in Casper who’s also on the Wyoming Board of Professional Geologists.

Due to the site, she said, much of her work is faster and easier. “Production data for wells can be downloaded and fed into Petra and a variety of other analysis tools,” she said. “I review completion reports and MDB notices online to further round out a data set.”

She publicly values that the website facilitates collaboration among individual consultants because it establishes a common pool of data.

George adds that, along with the North Dakota Oil and Gas Division website, “I have found no other state website to be as valuable and as easy to use as the WOGCC website.”

Shale Gas
from page 12

The Rockies producers did with drilling and how to make, especially, tight gas sands pay,” Trammel said. “They started using slick water and staged frac jobs, and that boosted well volumes and such.

“This created a monster breakthrough elsewhere because people started applying tight gas sand work to wells in the Barnett, the Marcellus, Haynsvilles,” Trammel said. “They were doing horizontal, which was key, and applying these big, slick water-staged frac jobs—That’s why they’re getting such huge volumes of gas out of shale plays elsewhere.

“Technically, the Marcellus developed an innovation that kind of came back to hurt;” Trammel added.

The Marcellus alone poses enormous competition.

“The Marcellus by 2020 could supply all of the northeast gas demand and even send some back to the Midwest’s mid-continent area,” noted AAPG member Pete Stark, vice president for industry relations at IHS-CERA, in the IHS-CERA study dubbed “Cream of the Crop: Performance Analytics for North American Gas Resource Plays.”

“The Rockies players must be creative with their markets,” Trammel emphasized.

“They must cut costs to the bone to compete with the higher volume plays that have NGLs associated with them.”

He noted that Horace Greeley’s advice from the mid-19th century to ‘go west, young man’ comes into play here.

“Rockies producers must look to the West Coast to see what kind of market they can do there,” Trammel said. “There’s existing pipelines to the West Coast, and also the planned Ruby pipeline will access significant Rockies supplies and make them available to consuming markets in California, Nevada and the Pacific Northwest.

“One of their big competitors for the West Coast gas market has been the Permian Basin, and now people in the Permian are focused on liquids, NGL,” he said. “This helps the Rockies a little with competition for the West Coast gas market.”

There’s been a huge decline in the rig count in the Rockies since August 2009, according to Trammel—indeed, at one point it declined by more than 50 percent.

“Even so, production is still sustaining at close to 9.3 Bcf a day,” he said. “That speaks to the amount of gas they’ve been able to find there.

“Reported increases in IP test volumes in the Piceance Basin are evidence that operators can boost the productivity side of the cost/foot equation,” Trammel added.

“Lower rig, supply and service fees should help on the cost side.”
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New Media Puts Different Slant on Spill Info

By DAVID BROWN, EXPLORER Correspondent

As soon as the Deepwater Horizon offshore drilling rig sank in the Gulf of Mexico on April 22, information about the accident began to flow across the world’s computer screens. You could find a description of response efforts on Facebook, at DeepwaterHorizonResponse, or through Twitter by following oil_spill_2010.

Dozens of industry sites were devoted to updates, including the official webpage at www.deepwaterhorizonresponse.com.

The world had its first cyberspill. AAGP member Clint Moore of Houston, a longtime Gulf of Mexico geoscientist, joined thousands of others in the industry in searching for facts online.

“Ther’s a huge thirst for information out here,” Moore noted. “We keep having to hunt around to find good, detailed information.”

BP, the well’s operator, had learned from previous crises in the industry. It made top executives available to the media and put out as much information as it could gather.

But the force of social networking outlets and new media coverage showed how difficult it is now to track a flood of online information.

“The new media definitely makes for a different information environment,” Moore said.

“Upstream Online seems to have good blow-by-blow reporting. That’s been an important source of information for those of us in the industry,” he added.

Moore also found helpful information and coverage on the website of Offshore Magazine – PennWell publishes the magazine and produces the site. And he cited a source that for him was unexpected.

“There’s been some interesting articles on the New York Times website,” he said.

A challenge for Moore and other offshore professionals was to find sites with both accurate and technically meaningful content.

“This is a technical language that most people in the world don’t have any reason to understand,” Moore noted.

“The problem with the Deepwater Response website is that it’s just a website that puts out what can be officially approved,” he added.

Opponents of offshore drilling were just as quick to draw on new media resources.

Moore heard of an environmental group’s plans to ask its members to photograph effects of the oil leak with their cell phones, and to post the pictures online.

Reactions to the accident inside the industry included as much concern as curiosity.

“Everybody I know who’s connected to the offshore industry is just devastated by the accident. Just everybody is devastated by the loss of the men and the damage that’s likely to happen to the environment,” Moore said.

Historical Perspective

By its nature, the Gulf of Mexico posed special challenges for the offshore industry. A spill from a breached tanker might make headlines for three or four days. The relatively smaller but daley and persistent leak from the BP well appeared in headlines for weeks.

And the complexity of the offshore operation was not a good fit with the nearly instantaneous, general information flow on the Web.

Moore noted that the National Transportation Safety Board typically takes a year to issue a report on an airline accident, after lengthy and detailed fact-finding studies.

Industry experts were pushed to answer questions about the rig disaster and leak response almost immediately, when a full understanding of events would be months away, at the least.

For Moore, putting the 2010 leak in perspective was an important step that also involved gathering information.

He recalled the blowout of the Permex exploratory well ibtoc: I well in the Gulf of Mexico, about 500 miles south of the Texas coast, on June 3, 1979.

That began a nine-month effort to stem the resulting leak, which discharged 10,000 to 30,000 barrels of oil a day into Gulf waters. World War II also brought a significant discharge of oil and refined fuel into the Gulf.

“Ther was a book called ‘Torpedoes in the Gulf,’ which covers in great detail the many tankers that were blown apart in the Gulf of Mexico,” Moore recalled.

Taken together, the sinking of so many U-boats and other ships – including American fuel tankers – constituted a major spill into Gulf waters, just as the ibtoc blowout did more than 35 years later.

“The good news is, the Gulf came back,” Moore said.

Statement by AAPG President John Lorenz

“The AAPG sends thoughts, prayers, and condolences to the injured and to the families of those who lost their lives in the recent Gulf of Mexico drilling platform disaster. Offshore drilling is a large-scale industrial operation with all of the challenges inherent in an industrial enterprise plus the added risk of working in an isolated environment surrounded by ocean. While recent offshore drilling has had an enviable safety record, that is of little consolation at the moment.

We all accept certain risks in our lives starting with the drive to the local grocery store, and we recognize that no undertaking can be made 100 percent safe. Nevertheless, catastrophic accidents such as this have global impact, affecting the economy, the environment, our industry, our profession, and individual lives. While AAPG members understand better than most the risks of dealing with forces of nature and drilling for flammable liquids in high-pressure environments, there are always unknowns. In the long run, industry and its dedicated workers will continue the quest for the energy that society needs, searching in these difficult offshore environments because it has been and can be done with relative safety. In the meantime, AAPG mourns the loss of life and the environmental impact.”

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The following is a list of the 10 worst oil spills (volumes approximate), courtesy of Livescience.com. Note that seven of the 10 worst oil spills were tanker accidents – and the worst spill was an intentional act.

Also, in each case the environment was not permanently harmed.

   The worst oil spill in history, the Gulf War oil spill spewed an estimated eight million barrels of oil into the Persian Gulf after Iraqi forces opened valves of oil wells and pipelines as they retreated from Kuwait. The oil slick reached a maximum size of 101 miles by 42 miles and was five inches thick.

2. Ixtoc I oil well (June 1979) – 3.4 million barrels.
   The Ixtoc I oil well exploded in the Gulf of Mexico and the oil platform caught fire and collapsed, rupturing valves and making it difficult for rescue personnel to control the damage. The spill continued for nine months.

3. Atlantic Empress/Aegean Captain (July 1979) – 2.14 million barrels.
   A Greek oil tanker called the Atlantic Empress collided with another ship, the Aegean Captain, during a tropical storm off of the island of Tobago in the Caribbean Sea. The Atlantic Empress disaster killed 26 crewmembers and is the largest ship-based oil spill.

   The Fergana Valley, one of Central Asia’s most densely populated agricultural and industrial areas, was the site of the largest inland oil spills in history.

5. Nowruz oil field (February 1983) – 1.92 million barrels.
   During the first Gulf War, a tanker collided with a platform in the Persian Gulf on Feb. 10, 1983, spilling about 1,500 barrels a day, until the platform was attacked by Iraqi planes in March and the slick caught fire. The Nowruz oil field was not immediately capped, because the field was located in the middle of the Iran/Iraq war zone. The well was finally capped by Iran in September – an effort that resulted in the deaths of 11 people.

   The ABT Summer tanker, travelling from Iran to Rotterdam, leaked oil and caught on fire about 700 miles off the Angolan coast in 1991. The disaster killed five of the 32 crewmembers on board.

   A fire aboard the Castillo de Belver tanker led to an explosion that caused the vessel to break in two. Oil spilled into the sea 24 miles off the coast of Cape Town, South Africa. Luckily, the oil caused minimal environmental damage as the direction of the wind moved the oil slick offshore, where it dissipated naturally.

8. The Amoco Cadiz (1978) – 1.60 million barrels.
   Stormy weather drove the Amoco Cadiz aground on the Portsalis Rocks, a 90-foot deep outcrop off the coast of Brittany, France. The ship split in two and quickly sank before its oil load could be pumped from the wreck.

   A violent explosion in the Mediterranean Sea near Genoa, Italy, aboard the Cyprus-based tanker the Haven killed six members of the crew and spilled 145,000 tons of oil off the coast of Italy. About 70 percent of the oil burned in the ensuing fire.

    The American-owned oil tanker Odyssey split in two 700 miles off the coast of Nova Scotia, spilling crude oil into the sea and catching fire as it sank, setting the spill alight. Because of hazardous weather conditions the Canadian Coast Guard could not immediately reach the spill, and much of the oil burned.

Also Exxon Valdez (March 1989) – 257,000 barrels
With a third mate at the helm, the loaded 986-foot vessel carrying 1,264,155 barrels of oil ran aground in Prince William Sound in Alaska. Exxon says it spent about $2.1 billion on the cleanup effort. 10
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Hydrocarbon ‘footprints’ detected

‘Bio’ Data Sweep Leads to ‘Geo’ Data

By LOUISE S. DURHAM, EXPLORER Correspondent

L egions of aspiring geologists have enjoyed (endured?) the challenge of summer field camps where they spend their days tramping across rugged terrain—often in the Rocky Mountains—to map the territory.

Until fairly recently, any thought of someday trading inkladaks and plane tables for fixed wing aircraft to use remote sensing technology to handle mapping chores would have been only a fantasy.

But we’ve come a long way, baby. Airborne LIDAR (Light Detection and Ranging) remote sensing technology is much in vogue in the industry today, largely because it produces multitemporal contributions to the exploration game.

High-flying technology is an apt description given that LIDAR measures surface elevation via a laser scanner mounted on a fixed wing aircraft or helicopter.

It’s particularly useful to provide an accurate high-resolution representation of the earth’s surface in areas having steep terrain and coniferous canopy—so long as the light can penetrate.

LIDAR mapping technology enables rapid collection and processing of datasets used to develop an accurate and detailed digital terrain model within three inches of elevation,” said Jerry Boyd, project manager at Merrick & Company in Aurora, Colo.

He summarized some of the applications:

- Support well pad site selection.
- Improve drilling permit application approval.
- Hyperspectral imagery can be used to perform oil seep anomalous zone detection.
- “We map the entire area and the client gives us criteria, such as pad requirements they want to achieve, like distance to navigable rivers, maximum acceptable slope, proximity to a water source for permitting requirements,” Boyd said. “We run an analysis on the surface model after we process it and do a probable pad identification for them—this lets them better focus on these areas to do field investigations to decide which ones to use.

“For the drilling permit and approval process, they have this very accurate information and analysis they can show to the BLM,” Boyd said.

This validates why they want a permit at this specific location, based on these parameters.”

Step by Step

Hyperspectral imagery is the arm of this technology that really gets into the intricacies of the land and the vegetation.

A regular color image has three bands of light—red, green and blue. Each band has 0-255 values of saturations of that color. Hyperspectral imagery covers a much wider range of the light spectrum.

“The two main light spectrum ranges we use are visual near infrared (VNIR) and short wave infrared (SWIR),” Boyd said. “In the range of these, we have 329 bands of light we can analyze, and each of these bands has 255 values.”

“You could see two different kinds of trees that appear to be the same when looking with the naked eye,” he said. “Using hyperspectral imagery, we can track things down to the individual species of vegetation, as each vegetation type has its own specific signature across this band of information.

“Besides looking directly for hydrocarbons, we can detect distressed vegetation,” Boyd emphasized. “Where is seeping to the surface, the vegetation is growing in an environment that’s not normal soil composition; this is referred to as a geo-botanical halo that basically indicates there’s distressed vegetation in this area.”

The technology also can be used to detect specific minerals in the soil and to identify mineral alterations that are a direct result of hydrocarbons in the soil. These mineral alterations differ depending on the predominant soil composition.

“When we run the analysis on hyperspectral imagery, we’re trying to find coincident occurrence of multiples of these conditions to give us the highest probability.”

Other companies reported to be going after the geese in the Niobrara include Anadarko, MDU Resources, and St. Mary Land & Exploration, Petroleum Development Corp., Noble Energy and committed shale gas devotee Chesapeake Energy.

Ray, who heads the annual (and highly successful) 3-D Seismic Symposium in Denver, noted the Niobrara is comprised of an interbedded rich source rock and brittle basically limestone beds that are usually referred to as chalk. It fractures naturally because the brittle facies is between more ductile shales.

“It’s present all over New Mexico, Colorado, Wyoming, Kansas, Montana, North and South Dakota,” Ray said. “It covers a gigantic area, so there’s plenty of areas to prospect.

“We’ve always gotten oil shows out of the Niobrara all over the Rockies,” Ray said. “It’s a result of horizontal drilling and staged frac technologies that you can now make the play economic.

“The excitement is if you get a large area that’s mature where the source rocks have generated the oil, then it becomes a big resource play,” he noted. “You just drill all the locations using long laterals and multi-stage fracs all along them so you can drain a large area.”

“Crackle Frac”

Niobrara is one of the few formation names used in virtually every basin in the Rockies. In contrast, nomenclature varies for the shale associated with the Niobrara, e.g., Mannoc, Cody, Steele, Baxter.

“Every state where there’s an outcrop, that same marine shale deposited in the Cretaceous seas has a different name yet the limestone in the middle is always called the Niobrara,” Ray emphasized. He noted the Niobrara has a unique fault and fracture pattern principally because it’s so brittle. He likened it to a brittle sandwich, with the limestone facies between two organically rich shale zones that source the chalk.

Ray coined “crackle frac” to describe the regional natural fractures.

“It’s like a sheet of glass where you flex the glass and it shatters,” he said. “It’s brittle, and it crackle fracs—it fractures over a wide area having only a little bit of fissure.

“There’s usually high TOC in the shale sourcing zones, and when the shales heat up they generate oil,” Ray said. “Because the brittle limestone member is in the middle of the sandwich, the oil migrates into the crackle frac.”

The old Niobrara model was it had to be on a structural feature or next to a fault zone or some tectonic influence to get the fractures,” he noted. “Now we know the formation naturally fractures—and it may have something to do with maturation of the source rocks.

“When they’re heated, there’s expulsion when the oil is generated,” Ray said. “I think part of the source creates the crackle fracturing. Also, because it’s a very brittle bed between more ductile beds, any regional compression or slight fracturing will crack the limestone first—it’s fairly thin and so much harder,” he said.

There’s definitely something different about the fault and fracture pattern in the Niobrara that’s not in units above or below,” Ray emphasized. “You see evidence of this unique characteristic in surface outcrop exposures and on seismic lines.

“Definitely it has a fractured personality,” he said.

There’s oil seepage in the area,” Boyd said. “We’re rank ordering all these anomalies we’re finding and coming up with a statistical analysis of the probability there’s oil in the vicinity.

“Then we or the oil company go to the field with a (portable) spectrometer and go to the high probability sites to collect spectral signatures in a much more macro environment,” Boyd added. “We do soil or liquid sampling and have lab analysis done to confirm the presence of hydrocarbons.

“When you’re looking at big tracts of land, hyperspectral is a much lower cost alternative to more costly exploration processes,” he noted.

A Costly Choice

LIDAR application has become almost routine for seismic data contractors in rugged areas like the Rockies.

For example, when implementing a data acquisition program using dynamite as the source, it’s common to move the dynamite onto the location via a buggy or truck. However, this may be impossible without specific data for the rugged terrain—and a helicopter may be required to drop in and then retrieve a helpable rig, which can eat up a bundle of greenback, at the Rocky Mountain Section annual meeting in Durango, Colo.

Using LIDAR-derived data the contractor can adjust the target points for drilling the shot holes such that they become accessible via drill buggy or vibrator, which is considerably less costly than the alternative.

Rockies from page 10

“T he big excitement here in Denver is the expansion of the Niobrara oil play between Denver along the Colorado-Wyoming state line,” Ray said. “It’s exploded in the last six months.

“Fueled the excitement about the play is the successful Niobrara wildcard well completed recently by EOG Resources. Dubbed Jake, the well produced an average 660 bopd during the first three months of production, according to the company.

Some industry experts say a typical new well in the Bakken might produce 100 to 150 bopd.

“When EOG released the information, I think everyone was shocked at the production being so big,” Ray said. “We all knew the oil was there, but no one pursued it with the new horizontal drilling and staged fracs that were fine tuned in all the shale gas plays.

“This year the company announced a huge acreage position, and they recently announced they’ll drill 40 wells in the play,” Ray said.

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In April, the good times were rolling again in New Orleans – there was plenty of music, food, exotic culture and a whole lot of fun. But the key word for all was “science.”

The 2010 AAPG Annual Convention and Exhibition returned for the eighth time to New Orleans, attracting 5,970 attendees for a meeting built on the theme “Unmasking the Potential of Exploration and Production.”

The meeting boasted an abundance of excellent presentations, dazzling displays of cutting-edge technology and unforgettable moments.

But the meeting’s central theme and overall message came in the opening session, cited first by general chair Tom Hudson and then emphasized by AAPG President John Lorenz.

“AAPG is about the science,” he said at the very start of his presidential address. “We are a scientific organization.”

This matters, he continued, because “science is becoming critical and crucial to being able to extract from the subsurface the energy that we need to be able to run civilization.”

That’s important, Lorenz said, because the world’s growing population and technological development demanded an ongoing source for energy.

“AAPG is scientifically oriented,” Lorenz said. “We are supremely poised to contribute to (solving) this global problem.”

Lorenz also documented and applauded AAPG’s contribution to maintaining and promoting the science that successful exploration demands.

“AAPG gives us the tools to do this,” he said. “It gives us Hedberg Conferences, where we advance the science. Publications where we disseminate the science. Conventions like this one, where we’re coming primarily to see the science.”

Other meeting highlights included:

Scott Tinker’s introduction of Sidney Powers Memorial Award winner Frank Brown – reading the citation prepared by recently elected AAPG president-elect Paul Weimer, who was ill and unable to attend the meeting.

The presentation of the L. Austin Weeks Memorial Medal to Larry Funkhouser, in recognition of “extraordinary philanthropy and service in advancing the mission of the AAPG Foundation.”

Standing-room only crowds for several presentations and events, including Bobby Ryan’s talk at the All-Convention Luncheon, Aubrey McClendon’s Michel T. Halbouty lecture, the Discovery Thinking technical session and James R. Moffett’s paper on the recent Davy Jones discovery in the Gulf of Mexico.

The 2011 AAPG annual convention will be held April 10-13 in Houston.
French Team Takes Top Honors in 2010 IBA

Graduate students representing the Institut Français du Pétrole took the top prize in this year’s Imperial Barrel Awards competition, beating out 11 other teams from geology and geophysical departments from around the world.

The finals were held in New Orleans right before the start of the AAPG Annual Convention and Exhibition. The IFP win marked the second consecutive year that a team representing AAPG’s European Region claimed first place in the global competition, which carries individual medals and a $20,000 prize for their petroleum geoscience department.

Members of the IBA winning team are Matthieu Bregeaut, Jeanne Pélb, Francois Espallat, Herman Rojas and Shitaliya Sengupta. The faculty adviser is Anne Duhen Jardin.

Finishing second (Selly Cup winners) was the 2009 winner, a University of Calgary, representing the Canada Region, which earned individual medals and $10,000 in scholarship funds for their department.

The remaining nine finalists each earned $1,000 in scholarship funds for their respective schools plus individual medals for themselves as IBA final participants. The finals teams were (alphabetical order):
- Africa Region – Obafemi Awolowo University, Ile-Ife, Nigeria
- Asia-Pacific Region – China University of Petroleum, Beijing
- Latin America – EAFIT University, School of Geology, Medellin, Colombia
- Eastern Section – West Virginia University, Morgantown, WV.
- Gulf Coast Section – University of Louisiana-Lafayette
- Midwest Section – Oklahoma State University, Stillwater, Okla.
- Pacific Section – San Diego State University, San Diego
- Rocky Mountain Section – Colorado School of Mines, Golden, Colo.
- Southwestern Section – University of Texas El Paso

The IBA program gives teams of students the chance to evaluate the petroleum potential of a sedimentary basin and to test their creative-geological interpretations. Their work must be completed in a six-to-eight week period, with results presented to – and judged by – an independent panel of petroleum industry experts.

A total of 57 teams from 18 countries competed in this year’s IBA program. Past IBA winners were teams from:
- 2009 – Moscow (Russia) State University, Moscow, Russia
- 2008 – The University of Oklahoma, Norman, Okla.
- 2007 – The University of Aberdeen, Scotland

For more information on the IBA program go online to www.aapg.org/iba.

Unconventional Thought: Get Out of the ‘Zone’

By SUSAN N. EATON, EXPLORER Correspondent

Obby Ryan, vice president of Global Exploration for Chevron’s Global Upstream Oil and Gas, challenged AAPG’s members to choose the “unconventional” route forward, relying upon creativity – coupled with technological thinking – to fundamentally change the way they view geological plays.

Ryan, an AAPG member and chairman of AAPG’s Corporate Advisory Board, drew on his experience of more than 30 years in the oil and gas industry to deliver an eye-opening presentation at the All-Convention Luncheon in New Orleans titled “Beyond Zone Six: The Imperative of Unconventional Thought.”

Citing the innovative design and construction of the Golden Gate Bridge – completed in 1937, it was the longest span bridge in the world and held that honor until 1964 – Ryan challenged AAPG’s members to think the impossible, to “build the bridge that could not be built.”

Ryan’s presentation on the imperatives of unconventional thinking set the tone for the 2010 Annual Convention & Exhibition in New Orleans, and left many geologists saying: “What if?”

“As explorationists, we often get framed by things beyond our everyday control – conventional thinking in these areas, and that’s bad,” said Ryan, a petroleum geologist by training and career experience. Those things, he said, include technology, economics, the environment and public and corporate policy.

“Many people view Zone Six as a depositional environment, a limit,” he said. “Actually, one might say that Zone Six is a state of mind … How do we move beyond that?”

Defined in geological terms, Zone Six sits seaward of the continental shelf – in the lower slope to lower bathyal regions – in water depths ranging between 1,550 to 6,000 feet. In 1970 when Ryan started his career with Texaco in New Orleans, the commonly held industry belief was there were no commercial prospects in waters deeper than 600 feet, and there were no sands – thus no reservoirs – in Zone Six.

For decades, these hard-and-fast rules limited creativity and, accordingly, oil and gas exploration. At Texaco, the term “deep water” used to be a four-letter word,” Ryan said.

Earlier in his career Ryan was assigned to Texaco’s deepwater team, and was told to “get us back into the deep water.”

At the time, Ryan’s skeptical response was: “What did I do wrong?”

Two decades later, Chevron is a world leader in the Gulf of Mexico’s deepwater exploration and production.

Say What?

In preparation for his address, Ryan polled exploration colleagues in Chevron, asking them to list sweeping changes that they had witnessed during the past 30 to 40 years – illustrating how many “truths” have been turned upside down by unconventional thinking and technological advances.

To name just a few:
- Big gas, discovered a long distance from market, has no value.
- There are no reservoirs in deep water.
- There are no thrust faults in the Gulf of Mexico.
- Color has no place in seismic displays.
- High angle wells (i.e., greater than 45 degrees) need special corporate permission.
- Shales are seals and sources, but not reservoirs.
- When you hit Zone Six, there is no sand, so shut the well down.
- There was a time deepwater exploration was called unconventional – drilling below salt was also called unconventional,” Ryan said. “Now it’s the time when that’s being called unconventional.

Moving Beyond Zone Six

Acknowledging the obstacles to moving beyond Zone Six thinking, Ryan said, “How do we open the door to allow your teams to be creative and not stifled? It takes listening.”

Companies, he explained, must find the unique balance between business drivers, the bottom line and the risks often associated with thinking unconventionally.

“When we come up with a new concept or idea, we need to try it,” he said, and in citing the successful adoption of bright spot theory or measurement-while-drilling technology, he added, “Be bold, and give it a shot.”

What quality does Ryan ascribe to successful out-of-the-box thinkers? “The one word that comes to mind,” he said, “is persistence.”

“Successful individuals continue to push their ideas, even when they’re the right things to do. It can be a long process,” he cautioned, “but when you’re convinced by the perception that something is impossible, don’t quit.”

The world’s oil and gas supplies will be “coming from the folks in this room,” he said. “New plays are credited to the new ideas that people think.”

To read more about this subject, visit the AAPG website.

WWW.AAPG.ORG
Quoting a natural philosopher, Mark Twain once wrote, “You tell me what a man gits his corn pon, 'e'll tell you what his 'pinions is.”

Aubrey McClendon famously gets his pon from unconventional gas plays. And as chairman and chief executive officer of Chesapeake Energy Corp. in Oklahoma City, his opinions about energy use are well known.

McClendon delivered the 2010 Michel T. Halbouty Lecture, “Shale Gas and America’s Future,” to a full house of about 700 at AAPG’s annual meeting in New Orleans in April.

His message:

With an abundance of natural gas production and reserves, the United States should move toward using gas for energy, as much as possible, and shift away from the use of polluting, more costly and imported energy sources.

Embracing natural gas might be an easy argument to make – but as McClendon acknowledged, it’s not an easy sell.

“I was naive in thinking it would happen over the course of a year. It will probably take place over five years,” he said.

Also, it’s a difficult argument to make from inside the industry.

When natural gas producers promote the increased use of gas, they’re seen as expressing a corn pon opinion.

To increase public support for natural gas use, McClendon said, Chesapeake Energy helped found the group America’s Natural Gas Alliance (ANGA). According to its promotional material, “ANGA exists to pursue a single mission: To increase appreciation for the environmental, economic and national security benefits of clean, abundant, dependable and cost-efficient American natural gas.”

The group has raised $80 million to $90 million with image advertising as its largest single expenditure, according to McClendon.

“I think we’re making progress – in the sense, it takes a long time to drill a well,” he said. “We’re building a foundation of people who are beginning to understand what we do.

“But remember,” he added, “our best customers are our worst enemies.”

Manufacturing a Cause

Large natural gas consumers in the United States have seen periods of supposed surplus alternate with periods of supposed scarcity, and large price moves taking place as perceived conditions change.

“One of our problems is that they say, ‘Not so fast!’ They don’t want us to find other uses for natural gas,” McClendon noted.

Andrew Liveris, chairman and CEO of Dow Chemical Co. argued against broadening the demand for unconventional natural gas production in a recent newspaper opinion piece.

Natural gas producers have suggested that this newfound gas be used preferentially as a transportation fuel and to displace coal in electricity generation. Some even propose government policy to lock in the increased demand that would come from these new sectors.

“But we have seen this move before, and it ends with wild swings in prices and the loss of well-paying manufacturing jobs,” Liveris wrote.

“A sound energy policy that helps direct natural gas to be utilized in manufacturing, versus being legislated into less efficient uses or in uses where there are alternatives, will help stabilize U.S. industry and lead to a resurgence of American manufacturing,” he added.

Supporters of increased natural gas use promote it as a cleaner, more environmentally sound alternative to the use of coal, especially in generating electricity.

“We’ve always had a good product. Coal has had its problems. Over time, more and more people become uncomfortable defending that industry,” McClendon noted.

He said 32 of 50 states have commercial natural gas production – more than the number of states producing coal – with gas use gaining in acceptance as coal use is increasingly challenged.

“You hear a lot about companies doing research trying to gasify coal. I can promise you, nobody is trying to coalify gas,” he observed.

McClendon also expressed confidence that natural gas will become an energy source of choice in the United States, displacing less desirable alternatives.

He compared it to a revolution in energy use.

“Like most revolutions,” he said, “you don’t understand the implications in the early days. It’s only later, when things play out, that you can see it.”

They made a difference: Discovery Session speakers (from left) Mike Forrest, Bill Zagorski, Marv Brittenham, Dan Smith, John Amoruso and Gregg Robertson.

Spotlight on Discoveries

I was an afternoon of standing for a lot of geologists as the 750 seats in the room were already packed for this year’s Discovery Thinking session, featuring six invited speakers sharing their personal “reek” of an oil (and gas) finder.”

The session, chaired by Charles Steenbach and Ed Dolly, was the third presentation of the 100th Anniversary Committee giving the spotlight to veteran explorationists who have had an impact on the science and profession of petroleum geology.

John Amoruso, past AAPG president and recipient of AAPG’s inaugural Michel T. Halbouty Outstanding Leadership Award, told of his concept of a beach in East Texas’ Cotton Valley Shelf – his concept was correct and the Amoruso Field producing from the Upper Jurassic Bossier formation was the result.

Marv Brittenham, as new ventures team leader for Encana Oil and Gas, used unconventional thinking to successfully tap the Haynesville shale in north Louisiana.

Mike Forrest spoke of his time working in collaboration with Marfan Doneray and applying “bright spot” technology, which helped Shell discover many large oil and gas fields in the Gulf of Mexico during the late 1960s to the late 1980s.

Gregg Robertson spoke on the ideas behind the opening of new horizons in south Texas with the Cretaceous Eagle Ford shale.

New ideas have kept the Stella Salt Dome in Plaquemines Parish, La., in the sights of past AAPG president Dan Smith, speaking of the 70-year production ideas that has kept the area renewed.

Bill Zagorski talked about his success in the Marcellus Shale.

The New Orleans’ Discovery Session was taped and will be made available via Search & Discover, AAPG’s online journal.

They made a difference: Discovery Session speakers (from left) Mike Forrest, Bill Zagorski, Marv Brittenham, Dan Smith, John Amoruso and Gregg Robertson.

HoD Takes Action in New Orleans

Every bylaws proposals considered by the AAPG House of Delegates were passed at the annual meeting in New Orleans.

One of the action items included adding new language to enable Section presidents to appoint delegates to three-year terms when affiliated societies have not conducted elections. This change eliminates the chronic lack of delegate representation from delinquent Affiliated societies, according to HoD Chairman Steve Sonnenberg.

Delegates also approved new language that essentially limits how long someone can serve on an outside committee. This is being done to encourage more membership participation on these outside committees, Sonnenberg said.

The other five proposals were of a legal housekeeping nature – largely to eliminate references to dates no longer necessary.

Of the 214 House delegates, 187 were present at the New Orleans meeting, where they elected Jeffrey W. Lund, Houston, as chairman-elect and Patrick J. Gooding, of the Kentucky Geological Survey, as secretary/editor.

They will assume office on July 1, when David H. Hask, a Boise, Idaho, consultant, assumes the HoD chairman gavel.

To read more about this subject, visit the AAPG website.
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It should come as no surprise that here at GEO-DC we spend a lot of time talking about energy and the future of energy. Our basic objective is to help people understand that oil and natural gas, which currently comprise nearly 65 percent of U.S. energy, provide the fuel and power needed for economic growth and jobs.

But while fossil fuels are the foundation of global energy—and will remain so for many decades, perhaps longer—we can expect alternative and renewable energy sources will continue to grow in importance. It is possible that a scientist or inventor will make a technological breakthrough in coming years that transforms the energy sector.

The Advanced Research Projects Agency – Energy (ARPA-E) is looking for that potentially “disruptive” energy technology. . . .

ARPA-E was authorized as an agency within the U.S. Department of Energy in the America COMPETES Act of 2007. But, like many government programs, it was created and received no funding (see January Washington Watch) until passage of the American Recovery and Reinvestment Act of 2009.

The stimulus bill provided $400 million to launch the agency, whose mission is “to fund projects that will develop transformational technologies that reduce America’s dependence on foreign energy imports; reduce U.S. energy-related emissions (including greenhouse gases); improve energy efficiency across all sectors of the U.S. economy; and ensure that the U.S. maintains its leadership in developing and deploying advanced energy technologies.”

But ARPA-E is not meant to be a typical government research effort. It’s modeled after DARPA, the Defense Advanced Research Projects Agency within the U.S. Department of Defense. DARPA was created in the late 1950s to respond to Soviet technical advances, such as the launch of Sputnik, at the onset of the Cold War.

According to Richard Van Atta of the Institute for Defense Analyses, DARPA has changed and evolved since its founding. It is a highly “agile” organization that is not risk averse, focused on “high-risk, high-reward” research. Its focus is “idea driven and outcome oriented.”

DARPA’s investment strategies more closely resemble those of venture capitalists than traditional government R&D programs. And that is how Energy Secretary Steven Chu, himself a Nobel Prize-winning physicist, describes the goal of ARPA-E in funding high-risk, high-reward research.

Using a baseball analogy he says they’re asking scientists to swing from the heels. Some will strike out. But other scientists will hit home runs and some will hit grand slams.

The research portfolio is broad. Program topics that ARPA-E is funding range from conventional energy and carbon capture to vehicle technologies and biomass energy.

There have been two funding rounds since the agency launched. The first encompassed many forms of energy; the second is more focused. Competition in round one was fierce, with only 1 percent of proposals submitted selected for funding.

Affordable Power From Water and Sunlight is the title of one funded project being conducted by Sun Catalytix Corporation. The firm is using sunlight and a catalyst discovered at the Massachusetts Institute of Technology to separate hydrogen and oxygen from either tap water or clean seawater. The science is proven. But ARPA-E funding will enable them to improve performance and develop prototype devices with an eye on commercialization.

If successful, the project will deliver an affordable renewable energy storage device that could be used in both off-grid and on-grid installations.

Solarlight and the catalyst split water molecules into hydrogen and oxygen suitable for use in a fuel cell to generate electricity. It is an elegant way to “store” solar energy – if it works as intended and can be deployed as cheaply as expected.

But the path of any new technology is typically bumpy, leading through the dreaded “valley of death,” as it tries to move from successful lab bench prototype to commercially viable product. The benefit of ARPA-E funding over private capital at this stage, according to Sun Catalytix, is that they can focus on improving technology rather than raising additional money.

“Our nation’s history is replete with examples of pioneers and entrepreneurs who took risks, said ARPA-E Director Arun Majumdar. “These innovators often failed initially, but quickly learned from those failures, competed against each other and innovated in both technology and business to create the largest industrial base the world has ever seen.

“ARPA-E’s goal is to tap into this truly American ethos, and to identify and support the pioneers of the future.”

ARPA-E is engaged in a daring enterprise, and more information about the funded projects is available on the agency website (http://arpa-e.energy.gov).
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Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin. This month’s column is the first of a two-part look at the role of reference surfaces in seismic interpretation.

‘Hilbert Transform’ Remains a Valuable Tool

By BOB HARDAGE

Geological interpretation of seismic data is commonly done by analyzing patterns of seismic amplitude, phase and frequency in map and section views across a prospect area. Although many seismic attributes have been utilized to emphasize geological targets and to define critical rock and fluid properties, these three simple attributes – amplitude, phase and frequency – remain the mainstay of geological interpretation of seismic data.

Any procedure that extracts and displays any of these seismic parameters in a convenient and understandable manner is an invaluable interpretation tool.

A little more than 30 years ago, M.T. Taner and Robert E. Sheriff introduced the concept of using the Hilbert transform to calculate seismic amplitude, phase and frequency instantaneously – meaning a value for each parameter is calculated at each time sample of a seismic trace.

That Hilbert transform approach now forms the basis by which almost all amplitude, phase and frequency attributes are calculated by today’s seismic interpretation software.

The Complex Seismic Trace

The action of the Hilbert transform is to convert a seismic trace $x(t)$ into what first appears to be a mysterious complex seismic trace $z(t)$ as shown on figure 1.

In this context, the term “complex” is used in its mathematical sense, meaning it refers to a number that has a real part and an imaginary part. The term does not imply that the data are difficult to understand.

This complex trace consists of the real seismic trace $x(t)$ and an imaginary seismic trace $y(t)$ that is the Hilbert transform of $x(t)$.

On figure 1 these two traces are shown in a three-dimensional data space $(x, y, t)$, where $t$ is seismic time, $x$ is the real-data plane, and $y$ is the imaginary-data plane. The actual seismic trace is confined to the real-data plane; the Hilbert transform trace is restricted to the imaginary-data plane.

These two traces combine to form a complex trace $z(t)$, which appears as a helix that spirals around the time axis.

The projection of complex trace $z(t)$ onto the real plane is the actual seismic trace $x(t)$; the projection of $z(t)$ onto the imaginary plane is the Hilbert transform trace $y(t)$.

At any coordinate on the time axis, a vector $a(t)$ can be calculated that extends perpendicularly away from the time axis to intercept the helical complex trace $z(t)$ as shown on figure 2. The length of this vector is the amplitude of the complex trace at that particular instant in time – hence the term “instantaneous amplitude.”

The amplitude value is calculated using the equation for $a(t)$ shown on the figure.

The orientation angle $\Phi(t)$ that defines where vector $a(t)$ is pointing (figure 2) is defined as the seismic phase at time coordinate $t$ – hence the term “instantaneous phase.”

Numerically, the phase angle is calculated using the middle equation listed on figure 2.

As time progresses, vector $a(t)$ moves down the time axis, constantly rotating about the time axis as it maintains contact with the spiraling helical trace $z(t)$.

Mathematically, frequency can be defined as the rate of change of phase. This fundamental definition allows instantaneous frequency $\omega(t)$ to be calculated from the time derivative of the phase function as shown by the bottom equation on figure 2.

---

Figure 1 – A complex seismic trace consisting of a real part $x(t)$, which is the actual seismic trace, and an imaginary part $y(t)$, which is a mathematical function calculated from the real part by a Hilbert transform. When the real and imaginary parts are added in a vector sense, the result is a helical spiral centered on the seismic time axis (t). This helical trace is the complex seismic trace.

Figure 2 – Instantaneous seismic attributes – amplitude $a(t)$, phase (t) and frequency (t) – that can be calculated from a complex seismic trace using the listed equations.

Figure 3 (above) – Instantaneous amplitude associated with seismic trace $x(t)$.

Figure 4 (right) – Instantaneous phase and frequency (top two panels) associated with the seismic trace displayed on the bottom panel. Note that negative frequencies are calculated at times $t_1$ and $t_2$. 
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Diversity Leveraged to Benefit the Bottom Line

By CAROL McGOWEN, Regions and Sections Manager

I t was like they saved the best for last. On the last day of the recent AAPG Annual Convention and Exhibition in New Orleans nearly 150 people attended the third Professional Women in Earth Sciences Diversity Seminar, this year focusing on “The Economics of Diversity – Competing For and Leveraging Employee Diversity in a Global Petroleum Industry.”

The seminar featured six panelists, themselves from very diverse backgrounds — the three women and three men represented U.S.-based mid-to-large-sized independents, an upstream major oil company, academia, government, and a national oil company from the Middle East.

The bottom line: it was clear that the work forces of successful organizations are diverse by design. And that diversity — in age or generation, gender, technical experience and cultural background — provides the creativity of thought and approach to problem solving necessary to solve today’s complex ESP challenges.

The Diversity Advantage

All panelists commented on their organization’s approach to diversity and how diversity is leveraged to benefit the organization’s bottom line.

For large companies like ExxonMobil with a global operations presence, the company must be focused on global workforce diversity.

“ExxonMobil’s strategy is to bring in people from different backgrounds and train them to the same standards,” said AAPG member Kim Bates, vice president of geoscience for ExxonMobil Development Company. “ExxonMobil’s large work force allows flexible work policies,” she said, “which in turn enable the company to accommodate diverse employee needs.”

For Allen Gilner, CEO of Drilling Info Companies in Austin, Texas, as a mid-sized, private, family-owned company, his company takes a “family first” approach. At the same time, Gilner said, he looks for “diversity of viewpoints” when hiring.

Hussain Al-Otibi, manager of Saudi Aramco’s exploration technical services department and AAPG’s Middle East Region president, explained that Aramco’s operations are centralized from within the Kingdom of Saudi Arabia.

“While certain social constraints and customs are culturally mandated, the company’s vast resources provide many opportunities to its employees,” he said. Al-Otibi shared statistics of a work force phenomenon common to many oil majors.

“Saudi Aramco, too, is undergoing the ‘big crew change’ with an aging work force,” he said — but as a result of proactive recruiting, “almost a quarter of our work force now is in their twenties.”

“For the industry, especially for large companies, 2007 saw increased diversity,” he said. “Most oil companies are under 35 years of age with less than five years experience.

This age-diverse and experience-diverse work force “created many new business challenges, which caused us to re-address how we recruit, on-board, train, mentor, challenge and reward our employees,” he said.

For AAPG member Scott Sach, geoscience vice president-Northern Division of Chesapeake Energy, “Chesapeake’s growth has transformed our work force significantly and provided the opportunity to rethink how we approach our business.”

In the past five years Chesapeake’s employee count has grown from roughly 2,500 predominately experienced employees, to over 8,400 employees, approximately 50 percent of whom are under 35 years of age with less than five years experience.

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**AAPG Divisions Announce Officers for Coming Year**

The three AAPG divisions have announced the results of the 2010 elections. All new officer terms begin July 1.

**Division of Environmental Geosciences**
- Editor (2010-12) – Kristin Carter, Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic & Geologic Survey, Pittsburgh.

They will be joined by the DEG Executive Committee by president Mary K. Harris, Savannah River National Laboratory, Aiken, S.C.; secretary-treasurer Douglas Carlson, Louisiana Geological Survey, Baton Rouge, La.; and past president Michael Jacobs, Pioneer Natural Resources USA, Midland, Texas.

**Division of Professional Affairs**
- President-elect (2010-11; President 2011-12) – Martin D. Hewitt, Nexen Petroleum USA; Piano, Texas.
- Treasurer (2010-12) – Daniel A. Billman, Billman Geologic Consultants, Mars, Penn.

They will be joined on the DPA Executive Committee by president Daniel J. Tearpock, Subsurface Consultants & Associates, Houston; secretary Paul Pause, consultant, Midland, Texas; and past president Paul Britt, Texplore Inc., Houston.

**Energy Minerals Division**
- President-Elect: (2010-11; President 2011-12) – Stephen M. Testa, Consultant, Mokelumne Hill, Calif.
- Vice president (2010-11) – Genevieve B. Young, BG Energy Holdings, Denver.
- Secretary (2010-12) – Frances J. Hein, Alberta Energy Research Conservation Board, Calgary, Canada.

They will be joined on the EMD Executive Committee by president Michael D. Campbell, 12M Associates, Houston; treasurer Kent A. Bowker, Bowker Petroleum, The Woodlands, Texas; and past president, Frank E. Walfes, Devon Energy, Houston.

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**In Memory**

Larkin James Akers, 86
Youngsville, La., March 26, 2010
Olen Columbus Allen (AC '69)
Edmond, Okla.
George A. Angle (AC '55)
Wichita, Kan.
Robert Ross Brillhart, 87
Lafayette, La., Oct. 31, 2009
Donald Gail Carpenter, 75
Amherst, Wis., March 27, 2010
James Warren Clark, 84
Abilene, Texas, Nov. 26, 2009
Theo Hamilton Dinkins Jr. (Life '96)
Canton, Miss.
Clifford G. Fittie, 86
San Francisco, April 16, 2010
Arthur John Fritz, 92
Evansville, Ind., Dec. 13, 2009
Neil Eugene Hanson (AC '56)
Houston
Clarence Rex Hewitt, 88
Jackson, Miss., Jan. 23, 2010
William Charles Krueger, 73
Tulsa, April 24, 2010
Joe Alex Laird, 92
Dallas, Dec. 1, 2009
William John Malin, 83
New Orleans, March 1, 2010
Ettore Marcucci, 67
Austin, Texas, April 7, 2010
Howard Stuart McColl, 82
Calgary, Canada, Feb. 19, 2010
Ronald G. Mercer (AC '63)
Edmond, Okla.
Richard Charles Oborn, 88
Piano, Texas, March 13, 2010
Mark Thomas Owen (AC '74)
Midland, Texas
Donald Alfred Parks, 79
Carefree, Ariz., Nov. 13, 2009
John Leighton Read, 88
Palo Alto, Calif., Nov. 30, 2009
Donald Frederick Reaser, 78
Waxahachie, Texas, Dec. 29, 2009
James Warner Roach, 83
Houston, March 31, 2010
Paul Eugene Schnurr, 82
Concord, Calif., Jan. 29, 2010
Woodrow Wilson, 85
Missoula, Mont., Dec. 30, 2009
Philip Patchin Wocott, 96
Enfield, N.H., Jan. 6, 2010

(Editors note: “In Memory” listings are based on information received from the AAPG membership department. Age at time of death, when known, is listed. When the member’s date of death is unavailable, the person’s membership classification and anniversary date are listed.)

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urvey says: AAPG members value the AAPG BULLETIN as one of our most important member services—and it turns out that its value is even greater than we realized!

Many professional societies view publications as a "profit center," but AAPG takes the view that publications better serve members with a goal to break even financially. The BULLETIN, now in its 82nd year of publishing, has an impact on the petroleum industry that is often overlooked. The BULLETIN has always been "peer-reviewed," but its high-quality papers and high publication frequency have increased costs since its inception.

The BULLETIN is a cost center. The AAPG publications department is lean, mean, and focused on cost control, and its high publication quality and low publication cost are ever more impressive when compared with peer societies. For example, the switch to electronic delivery of the BULLETIN in 2005 decreased financial losses associated with publishing 17,000 copies. The 7,000 BULLETIN subscribers who still want hard copy pays a surcharge for print, postage or both, depending on their location and membership level.

Peer societies are similar to AAPG in offering a print publication like the EXPLORER-with membership. However, they differ significantly from AAPG in how they make their peer-reviewed journals available to members. AAPG offers the BULLETIN in digital form free of charge to members. Peer societies charge an average of $46 per year for digital delivery—and even more for hard copies.

The good news about the AAPG BULLETIN doesn’t stop at its price: its quality continues to improve!

Manuscript submissions climbed to 210 during 2009, the highest number since record keeping began in 1990. Increased submissions allow the BULLETIN to be more selective about what it accepts for publication; indeed, the acceptance rate has trended to decrease for the last few years as more authors decided that the prestige of the BULLETIN and the relatively short response and publication times made the BULLETIN the best journal in which to publish their work.

As the BULLETIN becomes an even stronger journal, potential contributors cannot rest. It is crucial that authors continue to submit manuscripts for consideration and that more reviewers come forward to help with this increased manuscript volume.

Readers also can help to identify potential authors for contributions to E&P Notes – papers that focus on current plays and field descriptions that help readers understand how to improve their exploration and production activities in analogous fields. These are among the most popular papers, so encouraging potential authors increases the likelihood of valuable science making its way to those who read and use it most!

The BULLETIN moves into its 82nd stage with the recent election of new editor Stephen E. Laubach, who will start his term of service on July 1. Change is inevitable, but the quality of the science and the financial bargain it represents are likely only to increase.

The prime vehicle for disseminating the science

BULLETIN a Valued Member Service

By GRETCHEN M. GILLIS, AAPG Elected Editor

The prime vehicle for disseminating the science

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By GRETCHEN M. GILLIS, AAPG Elected Editor
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Article highlights include:

**Lateral variability and modeling implications**
Cornel Okonji, Ronald J. Steel, and Andrew L. Pettifer

This study seeks to understand and quantify the geometry and dimensions of the wave-generated turbidite beds that dominate the front of the Panther Tongue Delta, basinwards of the distributary channels, and to provide useful parameters for flow modeling of deltaic reservoirs.

**Understanding the geological processes**
Tobias Rudolph, Christian Melchers, Andreas Minkus, and Wilhelm G. Cidell-Weber

Extensive historic coal exploration data were combined with modeling to simulate permeability distributions in the Cretaceous and to assess the known fault system. This process led to a better understanding of surface gas seepages and identification of potential pathways of methane migration.

**A modern-day turbidite analog**
Yannick Calvet, Eric Deville, Guy Desaublioux, Roger Gribbaut, Pascale Huggeis, Alexi Moscovici, Georges Moscovici, Mick Nobile, Céline Pradet de Cora, and Julien Schmitz

Geophysical data and piston cores allow us to better understand the deposition, erosion, and structure of the Orinoco turbidite system. The Barbados accretionary prism controlled sea floor morphology as well as turbidite sedimentation.

**Modeling dolomitization reactions**
Fiona F. Whittenberger and Yiyin Xiao

The process of dolomitization is critical control on reservoir quality and the prediction of the spatial distribution of dolomitization is important in reservoir characterization. Geothermal convection is examined as a mechanism for the formation of substantial dolomite bodies.
Foundation Selects Leadership

Four Members of the Corporation and two Trustees for the AAPG Foundation were re-elected to new terms during the group’s recent meeting in New Orleans during the AAPG Annual Convention and Exhibition. Re-elected to five-year terms as Members of the Corporation were:

- Robbie Rice Gries, Denver.
- Frank W. Harrison Jr., Lafayette, La.
- Paul M. Strunk, Corpus Christi, Texas.
- Charles Weiner, Houston.

Re-elected for three-year terms as Trustees were:

- William J. Barrett, Denver.
- William L. Fisher, Austin, Texas.
- Fisher, as chairman of the Trustees, also announced the following funding approvals at the board’s meeting in New Orleans:
  - $30,000 in support of AGI’s Earth Science Week Program, “Exploring Energy.”
  - $20,000 in support of providing framed U.S. Geological Survey “Tapestry of Time” maps to be distributed in collaboration with the More! Rocks in Your Head program.
  - $3,000 to the Northern California Geological Society, to supply geologic maps of California to San Francisco Bay area teachers.

The next meeting of the Members of the Corporation is set for April 11 in Houston.

The AAPG Foundation was established to carry out scientific, educational objectives through the use of charitable, tax-deductible gifts and contributions from AAPG members and corporate entities. Trustee Associates support the AAPG Foundation, provide counsel and leadership to the Trustees, lend support to fundraising efforts and provide guidance of the scientific and educational agenda that it underwrites.

Today there are 275 Trustee Associates, and they play a stellar role in the development of AAPG’s financial resources, thereby dramatically accelerating its ability to support scientific educational programs.

Jim McGhay, Tulsa, and Walter S. Light Jr., Houston, are the newest members to join the group.

Foundation Trustee William E. Gipson recently established a new Named Grant to be awarded through the AAPG Grants-in-Aid Program.

The William E. Gipson Named Grant will be awarded beginning in 2011 to a Southern Methodist University graduate student studying petroleum geology. The Named Grants-in-Aid Program is a specially endowed segment of the Foundation’s Grants-in-Aid Program. It provides a gift that renews indefinitely while at the same time honors the donor or someone of his/her choosing.

Grants are awarded annually in amounts ranging from $500 to $3,000. Support of the Grants-in-Aid Program is important – each year more students apply than can be funded.

For details on how to support the Grants-in-Aid Program contact Rebecca Griffin, at 918-560-2644.

Contributions to the AAPG Foundation are tax deductible for persons subject to U.S. income tax.

Diversity

from page 36

the Energy Committee with research on carbon sequestration and geothermal energy resources in addition to fossil energy research and development, upstream petroleum issues and other science-related policy areas.

“Diversity in our industry is key to representing the views of the general population,” said Anderson, one of only eight geologists currently employed on Capitol Hill in Washington, D.C.

“More geoscientists are needed to work in government,” she added.

In the end, the panelists’ collective advice was for job seekers to build a solid foundation of technical skills, learn to communicate clearly, and have confidence in knowing that employers value diversity.
Think outside the computer screen.

Choose from over 50 exciting field seminars, short courses and online programs all designed with the goal of helping you explore and better understand the science of this industry. Please see the AAPG website for complete descriptions and registration information. Below are the highlights of courses coming up very soon. Make your plans now before seats get filled!

**Short Courses:**
- **Creative Petroleum Exploration**
  - Location: Calgary, AB, Canada, with the AAPG International Conference & Exhibition
  - Instructors: Edward Beaumont and Doug Strickland
  - **SEPT 11-12**
- **Image Log Interpretation**
  - Location: Calgary, AB, Canada, with the AAPG International Conference & Exhibition
  - Instructor: Laird Thompson
  - **SEPT 11-12**
- **Writing for the Bulletin – A Primer in Scientific Writing for Refereed Geoscience Journals**
  - Location: Calgary, AB, Canada, with the AAPG International Conference & Exhibition
  - Instructor: Gretchen Gilris
  - **NOV 8-12**

**Field Seminars:**
- **Fractures and Tectonics of the Northern Appalachian Basin**
  - Location: New York
  - Leader: Robert Jacob
  - **JUNE 21-25**
- **Sedimentology and Sequence Stratigraphic Response of Paralic Deposits to Changes in Accommodation: Predicting Reservoir Architecture, Book Cliffs, Utah**
  - Location: Colorado-Utah
  - Leaders: Keith Stanley, Michael Ryles
  - **SEPT 23-30**
- **Modern Terrigenous Clastic Depositional Systems**
  - Location: South Carolina
  - Leader: Walter Sexton
  - **OCT 2-9**
- **Applied Stratigraphy of Paleozoic Carbonate Platforms; Facies, Cycles, Sequences, Reefs, Reservoirs**
  - Location: Nevada
  - Leader: John Warner
  - **OCT 10-13**

**Online Courses:**
- **Renewable & Non-Renewable Resources – Overview & Integration: A Renewable Energy Certificate Course**
  - Instructor: Theresa Coffman
  - **LAUNCH DATE: JUN 1**
- **Introduction to Geological Reservoir Characterization**
  - Instructor: Roger Stitt
  - **SEPT 13-DEC 17**

**Last Chance:**
- **Essentials of Subsurface Mapping – Short Course**
  - Location: Houston, TX
  - Instructor: Richard Banks
  - **MAY 11-13**
- **Play Concepts and Controls on Porosity in Carbonate Reservoir Analogs – Field Seminar**
  - Location: Almeria, Spain
  - Leaders: Eran K. Frenken, Robert H. Gutenbr, Mateu Esteban
  - **MAY 16-21**
- **Reservoir Engineering for Petroleum Geologists – Short Course**
  - Location: Houston, TX
  - Instructor: Richard Green
  - **MAY 17-18**
- **Fundamentals of Petroleum Geology – Short Course**
  - Location: Houston, TX
  - Instructor: Stephen Bend
  - **MAY 19-21**
- **Complex Carbonates Reservoirs: The Role of Fracturing, Facies and Tectonics – Field Seminar**
  - Location: Naples – Rome, Italy
  - Leaders: Raffaele Di Culi, Davide Casabianca, Claudio Turini
  - **MAY 30-JUNE 5**
- **Exploring for Bypassed Pay in Old Wells – Short Course**
  - Location: Wichita, KS
  - Leader: Hugh Reid
  - **JUNE 7-9**
- **Folding, Thrusting and Syntectonic Sedimentation: Perspectives from Classic Localities of the Central Pyrenees – Field Seminar**
  - Location: Barcelona, Spain
  - Leaders: Antonio Teti, Antonio Borrias
  - **JUNE 7-11**
- **The Petroleum Industry: Upstream & Downstream – Short Course**
  - Location: Dallas, TX
  - Instructor: Stephen Bend
  - **JUNE 9-10**

For more information on any AAPG Education programs, call 918-560-2650 or toll-free 1-888-338-3387, or visit www.aapg.org/education.
Foundation Donors

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

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

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

The AAGP Foundation Trustees
From trains to planes, over the last 69 years, the AAPG Distinguished Lecture Program has grown and flourished throughout its history and has survived with triumph because of generous individual and company contributions. As a result, the AAPG Foundation currently funds from 10 – 14 lecturers per year.

You can increase the number of lecturers - visit foundation.aapg.org and learn how you can help!

Remember, if your company has an employee contributions matching program you could double your gift!

Please contact Rebecca Griffin, toll-free 1-888-945-2274, ext. 644 or visit the Foundation website at foundation.aapg.org
Students from Thailand’s three major universities presented their research in both poster and oral formats at the first annual Thailand Student Paper Competition, which was held April 1 at the offices of Chevron in Bangkok, Thailand.

Judges from SEAPEX, SEG, SPE, Chevron and PTTEP determined the generous cash prizes for all participating students and their university departments, provided by Carnarvon Petroleum Ltd., Salamander Energy, P3 Global Energy and SEAPEX.

Student awardees (presenters in bold) included:
- First place – Noppon Boonchuay and Sasinon Subsangtip, from Mahidol University.
- Second place – Watchara Klainklom, Yanlita Namphet and Saraneew Limtrak, from Chulalongkorn University.
- Third place – Wejare Amchawong and Praiwat Uptakarn, from Khon Kaen University.

The Southeast Petroleum Exploration Society (SEAPEX) Bangkok Chapter organized this first in the region event. Fresh off the success of this event, the Bangkok Chapter of SEAPEX is making plans to make the 2011 event more like the AAPG Student Expo and include students from universities in the surrounding region.

For information on student participation or corporate sponsorship contact SEAPEX Bangkok chapter president Bob Shoup at RobertC@pttep.com.
AAPG would like to thank all of the many sponsors that helped support the Section and Regional AAPG IBA Semifinals as well as the Global finals in New Orleans:

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### AAPG SECTIONS

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Efforts have been made to make sure all sponsors have been recognized as of print deadline, but if your company has been omitted, please accept our apologies.
Edith “Edie” Allison has retired as oil and gas exploration program manager, U.S. Department of Energy. She has opened a consultancy in Rockville, Md.

Timothy Berg, to geophysical adviser, Apache North Sea, Aberdeen, Scotland. Previously development geophysicist, BP, Houston.

Mark Cooper, to senior exploration adviser for Petromanas Energy, Vancouver, Canada. Cooper has his own consulting practice in Calgary, Canada.


Edward C. de la Peña has retired from Chevron after a 32-year-career of working in Texas, the Gulf of Mexico, California, West Africa and the Middle East.


Richard B. Hill, to senior geologist-northern Rockies, Whiting Oil and Gas, Denver. Previously senior geologist-Permian exploration, Whiting Oil and Gas, Midland, Texas.

Terry Leyenberger, to senior geoscience adviser, Apache, Houston. Previously senior geological adviser, Devon Energy, Houston.

Ernest Manconi, director of the Berg-Hughes Center for Petroleum and Sedimentary Systems at Texas A&M University, has received the Burnum Distinguished Faculty Award from the University of Alabama, his recent former employer, for his outstanding contribution to higher education. The Burnum Award is among the highest honors UA bestows on its faculty.

Louis J. Mazzullo, president of Mazzullo Energy, has moved his operations from Golden, Colo., to Denver.


Patrick Rasavage, to geophysicist, H.L. Brown Operating, Midland, Texas. Previously geophysicist, ConocoPhillips, Midland, Texas.

Phil Salvador, to senior geologist, Qatar Petroleum, Doha, Qatar. Previously consultant, Austin, Texas.

Barry S. Smith, to vice president-geoscience, Three Rivers Operating, Austin, Texas. Previously with Texas American Resources Co., Austin, Texas.

John L. Sharp, to vice president-geoscience, southern division, Chesapeake Energy, Oklahoma City. Previously geoscience manager-Hayesville district, Chesapeake Energy, Oklahoma City.

Douglas K. Strickland, to executive vice president of exploration and geoscience, PostRock Energy, Oklahoma City. Strickland has his own consulting firm in Oklahoma City.


John F. White, to senior geophysical adviser-central division, Devon Energy, Oklahoma City. Previously senior geophysical adviser, deepwater production GOM, Devon Energy, Houston.
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American Association of Petroleum Geologists wishes to express its appreciation to these sponsors who have generously supported the petroleum geology community and the 2010 Annual Convention & Exhibition.

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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. Reimbursements indicated do not require sponsors.)

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

For Active Membership

Alabama
Florence, Robert, Energen Resources, Birmingham (D.D. Lehman, P.A. Ferguson, R.M. Tisdale)

Colorado
Givan, Ann V., iReservoir.com, Littleton (D.M. Cox, D.G. Neese, D.S. Anderson); Riggins, Natasha Marie, Anadarko Petroleum, Boulder (S.W. Tinker, S.A. Sonnenberg, W.C. Reese); Thompson, Ryan Curtis, EnCana Oil & Gas (USA), Denver (H.A. Illich, J.S. Wickham, D. Spencer)

Kansas
Youse, John Clinton, Sunflower Energy, Overland Park (S.W. Allen, D.R. Finn, D.M. Allard)

Louisiana
Durlap, John Bettos, retired, New Orleans (reimstate)

Oklahoma

Pennsylvania
Burr, Jonathan L., Sylvan Energy, Pittsburgh (reimstate)

Texas
Adesina, Kehinde Samuel, Halliburton Consulting, Houston (K.E. Williams, J.L. Gevitz, T.J. Sheehy); Alwardt, Patricia Fiore, ConocoPhillips, Houston (P.H. Hennings, R.W. Krantz, P. O’Donho); Bhattacharya, Sweta, Petrolbel, Pano (G.J. Malecek, K.M. Wills, K.C. Voight); Campbell, Cameron Denney, ExxonMobil, Houston (M.D. Sullivan, M.S. Long, N.R. Stewart); Haire, Edgar Lee, INEKS, Houston (C.S. Davis, D.J. Collins, C.H. Truss Jr., Keith Asante, Jocelyn, BG Group, Dallas (T.M. Gibson, D. Keith, D.M. Cassettia); Leary, Barbara Rassmann, ExxonMobil, The Woodlands (J.E. Neal, R.D. Stewart, R.S. Bishop); Lomay, Philip William, Enervest, Houston (W.J. LeMay, R.L. Hixon, D.T. Wagner); Manaker, David M., BP Exploration and Production, Houston (J.J. Lelek, H.L. Harrison, P.G. Belvedere); McEvain, Pete Russell, Offenhauser Oil & Gas, Wichita Falls (B.S. Brister, J.W. Ritchie, R.M. Hough); Melhlop, Andrew L., Anadarko Petroleum, The Woodlands (D.E. Rice, W.A. Tedesco, P.J. Toowie); Oekerman, Mark R., Highland Exploration & Production, Houston (L.M. Knox, A.J. Skeyyan, G.W. Van Swageren); Pape, Kelly K., ExxonMobil Exploration, Houston (reimstate); Pollinger, Mark Lawrence, Schlumberger, Katy (J.L. Bennett, T.A. Strutz, J.N. Vorg); Walker, Donald, ConocoPhillips, Houston (S.A. Sonnenberg, T.A. McClurg, J.D. McCullough); Williams, Stephanie K., Terra Dynamics, Austin (T.D. Moody, P.R. Grant, D.L. Bell); Yip, Grant Y., ExxonMobil, Houston (J.E. Welton, J.M. Ajdukiewicz, J.R. Botes)

Washington
Lindsay, David S., retired, Spokane (reimstate)

West Virginia
Sholes, Adam Michael, Mountaineer Gas Services, Clendenin (E.M. Rothman, R.L. Snyder, M.M. Hlieman)

Australia

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Dawes, Ian Peter, Talisman Energy, Calgary (D.A. Delph, J.R. Hogg, R.A. Clark); Huff, Catherine, Nexen, Calgary (P. Demangeat, M.B. Rogers, R.S. Galant); Lazorek, Michael, Chevron Canada Resources, Calgary (J.S. Mattson, S. McAllister, T.R. Carter)

Ghana
Akabzaa, Thomas MBA, University of Ghana, Accra (J.K. Agbenonito, I.A. Botchway, C.K. Fordjour); Kuto, Jacob Mawuko, University of Ghana, Accra (I.K. Agbenonito, I.A. Botchway, C.K. Fordjour); Manu, Johnson, University of Ghana, Accra (J.K. Agbenonito, I.A. Botchway, C.K. Fordjour); Ntuk, Jacob, Mountaineer Gas Services, Clendenin (E.M. Rothman, R.L. Snyder, M.M. Hlieman)

Ivory Coast
Koutouan, Ange Didier, Petroci, Abidjan (D.J. Teapock, J.G. Chapman, A.W. Cherry); Ndj, Gerard Koe, Petroci Holding, Abidjan (D.J.

Continued on next page

Certification

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

Petroleum Geologist

Louisiana
Quinn, Michael Joseph, Plains Exploration & Production, Lafayette (B.D. Sydboten Jr., T. Bennett, J. Heppermann)

Texas
Bellamy, Justin, Pioneer Natural Resources, Irving (D. Sander, L.L. Brooks, J.A. Breyer); Champine, Arthur Lawrence, ExxonMobil Production, Houston (S.D. Conner, R.K. McClure, T.J. Frances)

Nigeria

Continued on next page
Regions Get New Focus on Website

By JANET BRISTER, AAPG Website Editor

Location, location, location. Depending on where in the world you’re standing—or sitting, or whatever position you’re in when you access www.aapg.org—your view of the AAPG website is different.

Your AAPG Web team has tapped into GeoIP technology and added a banner to the AAPG home page that will display a specific AAPG Region link to your computer.

If you’re in the United States, nothing will change for your AAPG home page. But if you’re in, say, India, you’ll see a banner across the top of the home page that is focused on the Asia-Pacific region. Simultaneously, members in, say, Italy see one that provides Europe region information, while in Brazil they are looking at one focused on Latin America. Wherever you are in the world—Africa, Canada, the Middle East, etc.—your computer will have a banner linking your computer to that Region.

This feature allows for more obvious navigation to the Region areas on the site and gives a more prominent, local focus to member activities over the globe.

How is this possible? This is based on your computer’s address that is given to it by the Internet Service Provider (ISP) hosting the services you are using.

So if you are a world traveler and started your day in London, England, but that evening was spent in New York City, the AAPG website you saw that morning will look different from what you see that evening. It’s pretty simple really. Just think of your telephone.

The telephone number consists of country codes and area codes and local exchanges. Similarly, the IP addresses are organized into sets within countries and geographic areas.

But here’s where the technology changes. Telephones didn’t usually travel, so the number was as stationary as the house address. Now, even though the phone travels, the number affiliated with that phones does not change.

When you are accessing the Internet, whatever device you are using is assigned an IP address managed through the local ISP. These are really long numbers (up to 12 digits) that reflect the geographic location of the ISP through which you are obtaining your services.

When you travel and use Internet services provided within that area, the IP reflects your location. These ISPs are very cooperative. They negotiate connections and verification in order to pass through e-mails and other data, using all kinds of different protocols. Tapping into that organization is how AAPG now serves up this new area-specific version.

So wherever you are... Good browsing!

Continued from previous page

Teapock, J.G. (Chapman, A.W. Cherry)

Japan

Ito, Makoto, Chiba University, Chiba (S. Yoshida, M. Fujwara, Y. Yaguchi)

Kuwait


Netherlands

Herrero-Fernandez, Maria J., University Complutense Madrid, Delft (R.R. Gries, A. Moscarriolo, A. Permayner)

Nigeria

Kaisch, Kenneth, Chevron, Lekki (H. Xiao, C.F. Kluh, T.L. Heidrick), Tiamiyu, Alimbade

Ishola, Mosumolu Limited, Lagos (O.S. Adegbeke, A.A. Adeyida, O.A. Olawoki)

Norway

Moore, David John, self-employed, Oslo (N. Pigott, G.T. Hime, L.N. Kaye)

Pakistan

Rafi, Salma, University of Karachi, Karachi (T.S. Hasany, M.Z. Khan, N.K. Siddiqui)

Saudi Arabia

Abimbade, A.A., Adebisi, A.A., Olawumi, A.A.

Kuwait Oil Co., Ahmadi (R.M. Zereik, K. Ahmed, S.S. Thakur)

Scotland

Mudim, Mike,-chevron Upstream Europe, Aberdeen (R.W. Blake, S.A. Haas, D. Morgan)

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EXPLORER
The Shale Gas Catch-22

Afford and surge through hybrid and recent job advertisements I was amazed at the number of ads that contained such phrases as “Must have shale gas experience, " "Documented shale gas experience required" or, my personal favorite, "Ten years shale experience needed.""

Besides some of the original folks in the Barnett play, who has 10 years working shales?

As geoscientists, I think all of us are able to learn and adapt to new plays, new basins and new ideas. This is just a normal part of our jobs. There is nothing magical about shale gas (or any unconventional play, for that matter). An experienced geoscientist has the tools to quickly climb the learning curve and begin making real contributions to these emerging plays.

I'm willing to bet that some of our best and brightest talents are not applying for these jobs. They are thinking, "I would be a perfect fit at Company X. Too bad I don’t have any shale experience.” Instead, Company X probably hires some guy who spent a year drilling Barnett wells, and thus thinks he is the world’s leading expert in unconventional resource plays.

In conclusion, to all the hiring managers out there – please give us a break with your “shale gas expert” job descriptions. Actually, don’t give us a break. Give us a chance.

Brian Repeke
Houston

LEADER'S FORUM

DEG from page 51

with education on the successful remediation of hydrocarbon impacts, new emerging technologies, best management practices and how to be more pro-active and preventative of accidental discharges to the environment and for mitigating the effect of greenhouse gases with carbon sequestration.

We also present research on hydrology and on water and natural resources sustainability related to hydrocarbon exploration and production.

All the statistics I have seen show that hydrocarbons are going to remain the dominant source of energy for some time to come.

As emerging third world economies continue to grow there undoubtedly will be the need to find more hydrocarbons to meet these demands – and we will ultimately find ourselves exploring and operating in many new and different places and environments.

I think there will also be an increasing expectation, or demand, that we as an industry find and develop these resources in an environmentally and socially responsible manner. Both the exploration geoscientist and the environmental geoscientist will be working side by side to see that these expectations can be satisfied.

The DEG is, and will be, an important and integral part of the AAPG organization now and in the future.

I am excited for the future of the DEG and am proud to have shared my experience as the DEG president with many of you.

CLASSIFIED ADS

POSITION AVAILABLE

Petroleum Exploration Geologist
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Tulsa, OK

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

The successful applicant will generate and update maps, logs, cross-sections and corporate database with new logs, correlations, shales and other pertinent geological data. Develop regional, multi-county stratigraphic framework and subsurface correlations. Minimum qualifications, ten years of experience, knowledge of Mid-Continent upstream oil and gas, experience with conventional and unconventional plays, experience doing play/fairway analysis assessments. Send resume to beth@newfield.com.

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Ads are at the rate of $2.90 per word, minimum charge of $60. And, for an additional $50, your ad can appear on the classified section on the AAPG web site. Your ad can reach more people than ever before.

Just write out your ad and send it to us. We will call you with the word count and cost. You can then arrange prepayment. Ads received by the first of the month will appear in the subsequent edition.

Let us know if you are interested in placing a classified ad in the EXPLORER. We look forward to hearing from you.

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The science to find energy
**DIVISIONS REPORT**

**An education and advocacy role**

**DEG Looks for E&P Environment Balance**

By MICHAEL A. JACOBS, DEG President

In this, my last article as president of the Division of Environmental Geology, I am going to take a few moments to express my thanks to all of the hard working DEG members who helped throughout the year to make this a tremendously successful year.

Thanks to all the DEG officers, Advisory Board members, EG Journal Editor, DEG committee members, AAPG staff members and all the other DEG volunteer members who did an exemplary job putting together programs and moving forward with many new initiatives.

DEG is making great headway in its efforts to grow more internationally, and members such as Peter Lloyd, Jeff Aldrich, Peter Kutka, David Cook and others are working toward a joint meeting with the Geological Society of London related to the geological sequestration of CO₂. DEG put on excellent programs at the annual meetings and in several Sectional meetings and formed an official affiliation with the Environmental and Engineering Geophysical Society.

And we aren't done yet. We all know that the reward for a job well done is the opportunity to do more.

That said, I think it is fair to say the recent events taking place in the Gulf of Mexico highlight some of the purposes behind the existence of the Division of “Environmental” Geosciences.

But first, I think we all need to take a moment for thoughtfulness and prayers for those families who lost their loved ones in this tragedy. We should always be reminded that no matter how smart we think we are, or how good of explorationists we claim to be, it is the rig hands and roughnecks that are tasked with the daunting and dangerous task of bringing these hydrocarbons to the surface. Whether it is on a huge multi-million dollar, deepwater rig in the Gulf of Mexico or just a small rig running out in the dusty desert of the Permian Basin, where two roughnecks lost their lives in separate accidents just this week alone, it is a dangerous business we are in.

My respect and admiration goes out to these individuals.

It will be some time, perhaps years, before the full environmental impact of this incident is fully assessed. It will no doubt change the way that exploration and production goes on in the offshore environment – and with all the tragedies, after all the investigations are completed we will in the long run be better, and safer, at how we conduct our business in these environments.

I hope that DEG members will be able to put together some sessions and papers on the environmental impact of this incident in future AAPG meetings.

To me, that is the primary job of the DEG – to be the voice and the advocate of this industry on all environmental matters related to E&P activities, and to educate AAPG members and the general public on how we can balance the search for and the production of hydrocarbons with protection of the environment.

DEG puts on numerous sessions and talks on the impact of hydrocarbon releases and spills to the environment, but more importantly these talks present real solutions to these impacts.

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**DIRECTOR'S CORNER**

**Going to Calgary? It Should be Obvious**

By RICK FRITZ, AAPG Executive Director

Recently, I read a list of questions supposedly asked of park rangers at the Grand Canyon National Park, which included these examples:

- At the Grand Canyon they have been asked, “Is the canyon ‘man made’?”
- At Carlsbad Caverns a regular question is, “Is all of the cave underground?”
- At Yellowstone National Park, “Does Old Faithful erupt at night?” is often asked of park rangers.

The most common of all questions at the parks is, “When does the 5 p.m. bus leave?”

My favorite question comes from rangers at national parks in the eastern United States. Here tourists often ask, “Why are there so many Civil War battlefields in national parks?”

I have asked my share of dumb questions in my lifetime. Sometimes we just miss the obvious.

One thing I won’t miss is the upcoming AAPG ICE meeting in Calgary, Sept. 12-15. ICE is AAPG’s acronym for International Conference and Exhibition, and this will be the first time that ICE is held in Canada.

The conference theme is “Frontiers of Unconventional Thinking: Saddle Up for the Rodeo!” This is a great opportunity to experience a global technical program – including focus on unconventional reservoirs in Canada and worldwide.

The technical program will include 350 oral and poster sessions on themes ranging from petroleum systems to environmental to reservoir management (refer to the official ICE announcement that was included with this month’s EXPLORER for more details).

I am especially interested in the session on “Exotic Reservoirs of the World – Chalks, Cherts, Phosphates, Granites and Hydrates.”

There will be a special focus on Tuesday on shale reservoirs. Several special sessions and forums will be held. Notable is the forum on “E&P Challenges in Complex Environments: From Arctic to Deep Water.” Also on Monday is a special lecture on “Burgess Shale Takes” that should be interesting.

There are also great opportunities for continuing education. “Creative Petroleum Exploration” will be a highlight, plus courses from “Fault Seal Analysis” to “Geomechanics for Unconventional Reservoirs.”

In addition, the Canadian Society of Petroleum Geologists is conducting one of its well-known core conferences. Participants will review up to 30 integrated core and poster displays. Focus is on unconventional, frontier and international hydrocarbon systems.

AAPG’s Energy Minerals Division also is conducting a core workshop on the Alberta oil sands:

Of course, when you are talking about September in the Canadian Rockies you are talking about great weather for great field trips. There are currently nine pre-conference and seven post-conference field trips planned. Trips are scheduled from the Fraser River of British Columbia to the southern plains of Alberta.

This is a tremendous opportunity to get back to the rocks and spend quality time in the field.

Finally, this will be a great opportunity to network with geoscientists from all parts of the globe and view the newest technologies on the exhibit floor.

The entire meeting will be held in the TELUS Convention Centre in downtown Calgary, so it will be a very convenient venue.

The most common answer by rangers to the question, “Why are there so many Civil War battlefields in National Parks?” is: “Well, they fought here to be close to the parking lots, toilets and restaurant facilities.”

Of course, that is obvious.

So ICE in the second week of September? This seems pretty obvious, too. We hope to see you there.

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Website: [WWW.AAPG.ORG](http://WWW.AAPG.ORG)
E-Wave advanced imaging is now under way in the Gulf of Mexico.

The E-Wave* advanced imaging project will enhance the quality of approximately 30,000 km² of existing wide-azimuth data, covering phases I–V of the E-Octopus survey, by making full use of the latest WesternGeco pre-conditioning and imaging algorithms.

WesternGeco will apply the data-driven velocity modeling technique of full-waveform inversion plus tilted transverse isotropic reverse-time migration to produce improved images in and below areas of great structural and velocity complexity. The E-Wave project will also incorporate true 3D GSMP® general surface multiple prediction processing.

We listen to your challenges.
We understand your needs.
We deliver value.

To learn more about our imaging products and new acquisition projects, call +1 713 698 1000.