



## Basic Training

**Boot camp  
preps recruits  
for success**

See page 14

ingenuity.



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**On the cover:** Hands-on training had a new and urgent meaning for students at a Houston-based geology “boot camp” — young professionals who underwent intense training so they could be even better at their job. See story on page 14. Part of their training included field trip such as this one, to Pedernales Falls State Park, where Lans Taylor discussed the excellent exposures of Paleozoic (Pennsylvanian through Ordovician age) sediments subcropping Lower Cretaceous limestones at the Hercynian-age unconformity on the south margin of the Llano Uplift. Photo courtesy of Subsurface Consultants and Associates.

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## PRESIDENT'S column

# Myths, Realities And Sticky Bites

By SCOTT W. TINKER

My wife Allyson and I are in a book club. The selections are eclectic and almost always fiction, except for the time we sent a non-fiction shock through the system by choosing David McCullough's 750-page masterpiece, “John Adams.”

To counterbalance the blithe romp through the book club garden of fiction, the other books that I read are non-fiction. Such grippers as “The Bottomless Well”; “The World is Flat”; “Science, Evolution and Creationism”; “A Short History of Nearly Everything”; “The Bottom Billion”; “The Black Swan”; “Physics for Future President's”; “Guns, Germs and Steel”; you get the picture.

Before I continue, a confession: I often read about a third of a book before I get the gist and begin to bore. Sometimes I will manage two-thirds before I stop. If it is particularly captivating, to honor the author, I finish it! I also typically have about five books going at once, and thus remain totally confused as to who actually said what.

Recently a friend recommended “Made to Stick,” by the brothers Heath. Having read several business and ethic books *du jour*, I was skeptical. I finished it!

An Internet synopsis of the book explains, “Urban legends, conspiracy theories and bogus public-health scares circulate effortlessly. Meanwhile, people with important ideas – businessmen, educators, politicians, journalists and others – struggle to make their ideas ‘stick.’”

To the list of people described above I add scientists and engineers – you and me. And to the list of important ideas I add energy – our profession.

\* \* \*

Last August in this column I identified 10 “sticky” energy myths and countered with some realities. “Made to Stick” helps us understand why these myths and legends propagate and last in the public conscious.

We learn that sticky ideas are Simple, Unexpected, Concrete, Credible, Emotional Stories. The clever reader will recognize the acronym (SUCCEsS). Sticky ideas do not require all six attributes – but the more, the stickier.

Enter the energy sound bite. Simple, concrete, emotional stories with just enough factual underpinning to stick! To wit:

- ✓ We cannot drill our way out of an energy crisis!
- ✓ Oil production is peaking!

✓ The United States should be energy independent!

✓ Big Oil is evil!

✓ Fossil fuels cause global warming!

✓ Renewable energy will end dependence on foreign oil!

✓ Americans are addicted to oil!



Tinker

Of course, it is tempting to “bite” back:

✓ U.S. energy policy means “not drilling” our way into an energy crisis!

✓ Global unconventional oil and natural gas resources are abundant!

✓ Energy nationalism undermines energy security!

✓ Save Big Oil to ensure energy stability!

✓ Fossil fuels are the solid bridge to an alternate energy future!

✓ Energy is not renewable!

✓ Americans are addicted to air! (My apologies – I couldn't resist a flippant response to this silly notion. Modern economies are addicted to food, water, air and energy, among other things. However, oil represents less than 40 percent of the energy mix today and has

**‘Made to Stick’ helps us understand why these myths and legends propagate and last in the public conscious.**

been declining in percentage terms since 1979, driven by energy efficiency, supply and demand, technology and resource limits; not by climate change or energy policy.)

The problem with sticky sound bites – including my own rather feeble attempts – is that they oversimplify at best, and mislead at worst.

Of course we cannot drill our way out of an energy crisis. Oil is a finite resource. My second grader and most of the developed and developing world

See **President**, next page

## Registration Opens for Denver Meeting

Online registration has opened for this year's AAPG Annual Convention and Exhibition – and the sooner you sign up for the meeting, the more money you can save on registration fees.

This year's convention will be held June 7-10 in Denver, with the theme “Image the Past, Imagine the Future.”

As in past years the registration fees will be structured on a “tier” bases, and



earlier registrants can save several hundreds of dollars by taking early action.

A complete program announcement, including the details of the technical program, field courses, short

courses and luncheons will be included with the March EXPLORER.

For now, meeting details are available online at [www.aapg.org/denver/index.cfm](http://www.aapg.org/denver/index.cfm).

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# Utah Teacher Receives Honors

Ty Robinson, an award-winning science educator who teaches geology and earth sciences at Utah's Provo High School, has been named AAPG's 2009 Earth Science Teacher of the Year.

Robinson, who last year was president of the Utah Science Teachers Association, also works with television station WGBH in Boston, teaching workshops for its Teacher's Domain Internet program.

His award as AAPG's Teacher of the Year is \$5,000, a prize funded annually by the AAPG Foundation. The money will be split, with \$2,500 designated for educational use at Provo High School under Robinson's supervision and the other half for his personal use.

He also will receive an all-expense paid trip to the AAPG Annual Convention and Exhibition in Denver June 7-10, where he will be presented with his award at the All-Convention Luncheon.

A native of Provo, Robinson has taught in the public school system for 21 years, including 10 years at Spanish Fork Junior High and the past eight years at Provo High, where he currently teaches geology, earth system science, Advanced Placement environmental science and an academic unified studies course.

He also taught three years at Brigham Young University as an adjunct professor in the David O. McKay School of Education.

In addition to his teaching duties



Robinson

Robinson has been involved with writing curriculum and state criterion tests for Utah.

He graduated from Brigham Young University with his bachelor's in earth space science in 1987, and received his master's degree in geology from BYU in 2002.

Robinson previously has been honored with the Presidential Award for Excellence in Science and Mathematics Teaching; the Huntsman Awards for Excellence in Education; the Governor's Medal for Science and Technology; Outstanding Earth Science Teacher; and Utah Water Educator of the Year.

An interview with Robinson will appear in a future EXPLORER. □

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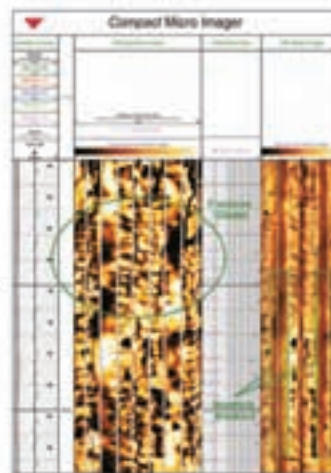


Image data obtained in a horizontal CBM (Coal Bed Methane) well with CM on Well Shuttle.

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## President from page 3

understand this. But this sound bite conveys a misleading message that offshore drilling will not matter at all and should not be done, based in part on antiquated notions of negative environmental impact. The negative economic and security ramifications of not drilling our own resources as we transition to alternatives are significant.

U.S. energy independence is an interesting concept, but it conveys the misleading message that it is actually possible to become energy independent soon.

In reality, such independence will be unachievable for several decades, and the idea distracts from the more important goal of energy security, which has a very different set of strategic objectives, including efficiency, diversification, improved global energy trade and investment, and dialog between developing and developed nations.

\* \* \*

I could continue discussing the other sound bites. Instead, for critical issues such as energy, the economy and the environment, let us set the sound bites aside and address the difficult and very real challenges of making the hard compromises necessary to tackle solutions.

In many ways it starts with public education.

I have presented over 250 public addresses in the last 10 years. Often I am preaching to the choir. But many times I am in public forums where people greatly appreciate seeing the data and hearing fact-based candor, even if it challenges their (sound bite) notions.

Let's build a bridge to the public: I ask each of you to commit to give one talk this year in a public forum.

If 33,000 members speak to 50 people each we reach 1.65 million people this year alone.

I challenged an audience of about 100 in Singapore last month to reach out in this way. One spoke up and said that when he presented a talk to his public school, someone scratched his car with a key!

I asked him if he planned to try again. "You bet," he replied. "My car is already scratched!"

Be the bridge.

*Scott W. Smith*



\*Head of Schlumberger - Measurement, Impact for a world of Schlumberger. © 2009 Schlumberger. 0945-0027

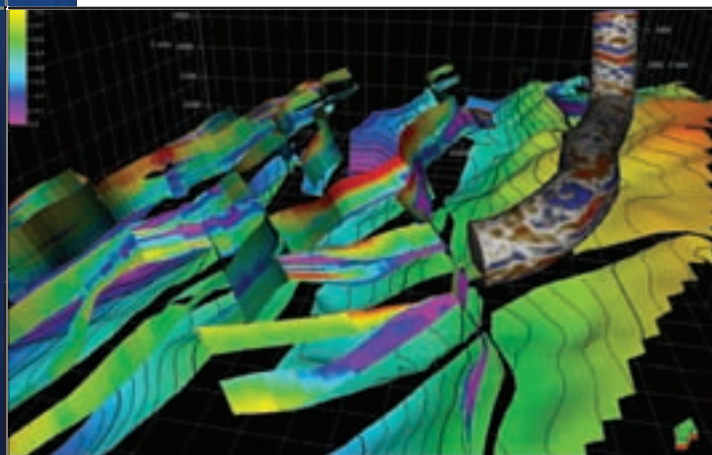
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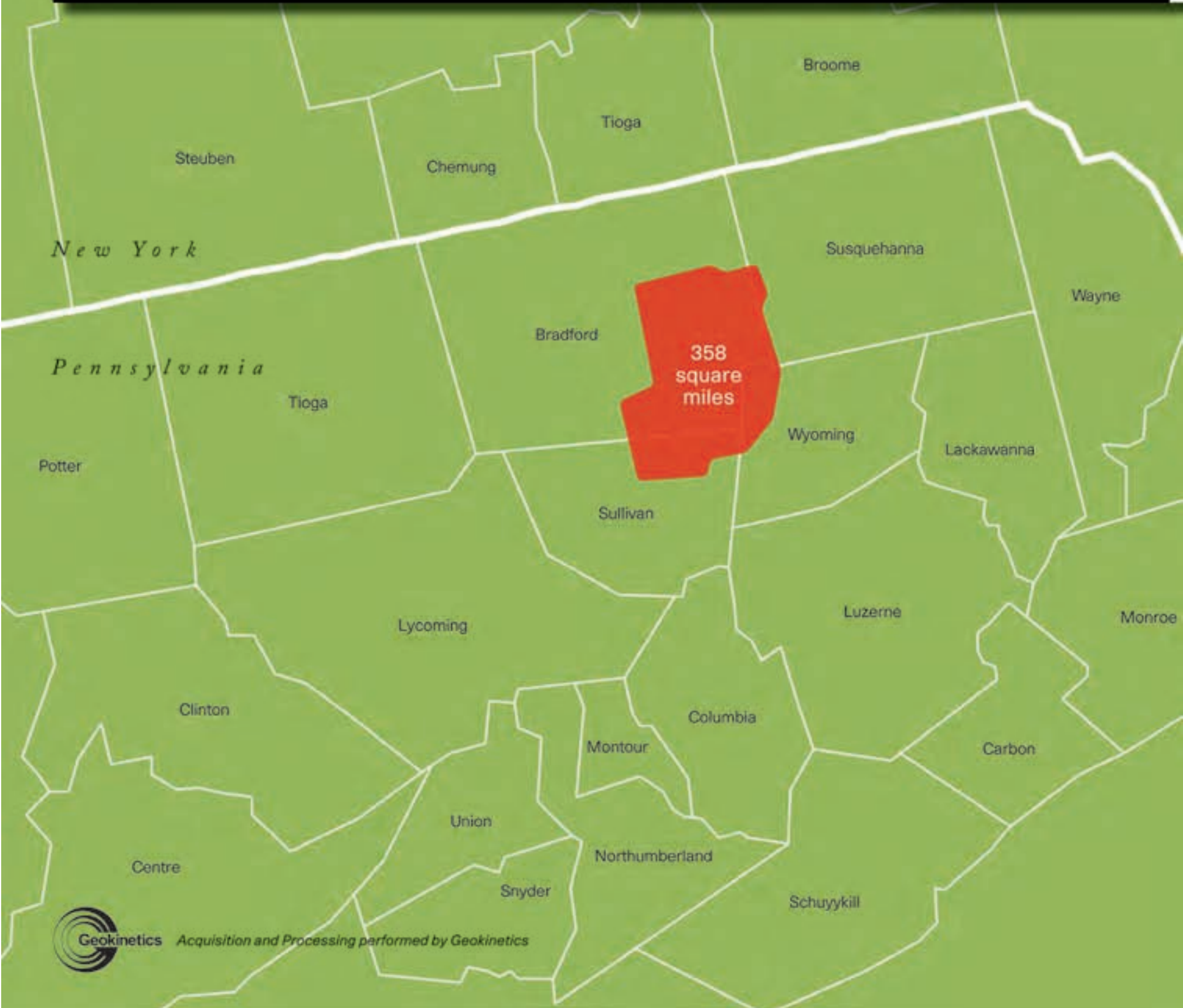
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# Deep Bossier A Long-Life Asset

By LOUISE S. DURHAM  
EXPLORER Correspondent

During 2008, the mainstream press and many energy industry financial analysts apparently viewed unconventional shale plays as the greatest thing to come along since sliced bread and cold beer.

The considerable hype essentially obscured the fact that there's other mighty hip – and lucrative – activity in the domestic arena.

For example, there's excitement aplenty in East Texas, where operators are working fast and furiously to tap into the natural gas riches contained within the Deep Bossier play, which lies basinward of the Jurassic shelf edge.

The wells tap into the Deep Bossier at depths between 15,000 and 20,000 feet, where they intersect over-pressured shale and sandstones a few thousand feet thick.

This is treacherous – and expensive – drilling, but the payoff can be humongous.

Initial production rates of 20 MMcf/d are pretty much the norm, with some of the wells coughing up more than 50 MMcf/d.

Sitting squarely in the latter category are the Bonnie Ann 1 and the South McLean B1 wells in the Amoruso Field. They represent two of the nation's five largest wells since 2002, with initial gross production rates exceeding 50 MMcf/d, according to Amoruso Field owner/operator EnCana.

## Amoruso Had an Idea ...

The field originated via an idea and a concept developed by geologist and past



Graphic courtesy of John Amoruso

AAPG President John Amoruso who has worked the East Texas area since 1963 (see related story, page 10).

Once Amoruso secured financing to go after the 43,000 acres of land he zeroed in on to acquire, the initial well went down in 2004.

The money came via investor Guma Aguiar who then formed Leor Energy to operate the first well in the field. They recognized early on what a challenging treasure trove they had tapped into and formed a joint venture with EnCana who initially acquired a 30 percent interest in the field.

The company eventually forked over \$2.55 billion late in 2007 to acquire all of the Deep Bossier natural gas and land interests held by Leor.

The Leor acquisition included:

- ✓ Leor's remaining 50 percent interest in the Amoruso Field.
- ✓ Daily gas production of about 75 million net cubic feet/day.
- ✓ About 26,000 net acres of land in Amoruso, centered in Robertson County about halfway between Dallas and Houston.
- ✓ About 9,100 net acres of offsetting land to the east at South Hilltop.

✓ About 20,600 net acres of other undeveloped lands in Robertson and Madison counties.

✓ Total East Texas land of about 56,300 net acres essentially undeveloped.

The acquisition increased EnCana's total land holdings in the Deep Bossier trend to about 215,000 net acres.

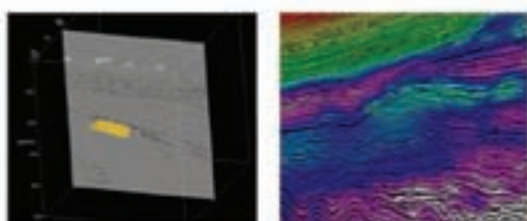
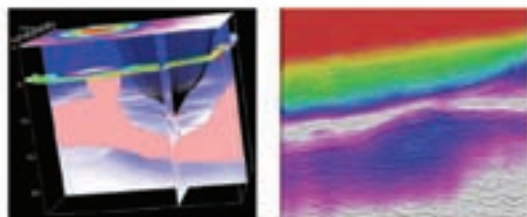
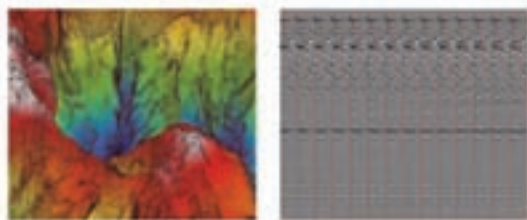
The company recently announced it has cut back its shelf program in the general area while preserving most of its work in the Deep Bossier, particularly the Amoruso, with a 10-rig program in the works.

See **Amoruso Activity**, page 12

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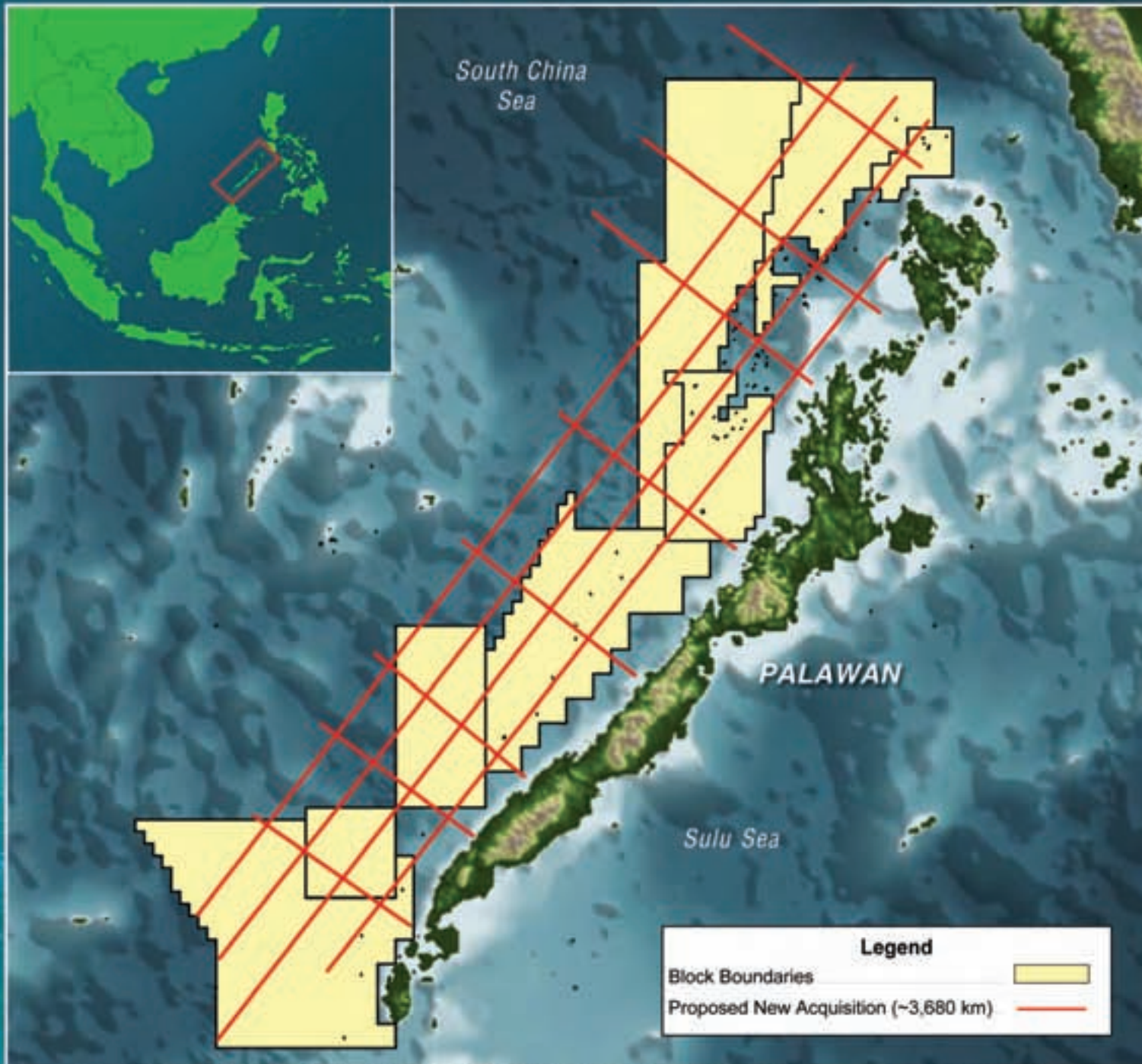
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Idea was 'falling off the shelf'

# Amoruso's Concept Came to Play

By LOUISE S. DURHAM  
EXPLORER Correspondent

It's said the oil and gas business is second only to the space industry in the use of sophisticated technology.

Yet there are oil and gas explorers out there who occasionally demonstrate that finding the Big One doesn't necessarily require any high-tech applications – or even access to a lot of geologic detail for that matter.

Sometimes all it takes is an idea, a concept – and some money to prove up the concept.

Just ask geologist and past AAPG president John Amoruso, who used this approach that led to the 2004 discovery of his namesake, the dynamic Amoruso Field in East Texas.

The seasoned explorer had been honing his expertise in the East Texas area since 1963 and became particularly intrigued with the Upper Jurassic Bossier formation drilling activity on the Jurassic Cotton Valley shelf edge.

But Amoruso had other things on his mind – specifically the potential for the deep Bossier sands dumped over the shelf edge.

"The Mims Creek and Dew Creek fields that Anadarko was developing showed the shelf Bossier had a lot of potential," he said. "But as you went into deeper water (depositionally) you could see the sand sections built up, got thicker, more frequent and seemed to get better reservoir qualities, or better permeability and porosities.

"We didn't have data to see what the Anadarko wells were doing," Amoruso



Photos courtesy of John Amoruso (top), EnCana

Activity at the East Texas Amoruso Field, named after its discoverer, John Amoruso (top photo), an Honorary AAPG member who is vice chair of the AAPG Foundation Board of Trustees. He also was AAPG president in 1983-84 and in 2007 was the inaugural recipient of the Halbouty Outstanding Leadership Award.

said, "but I knew in the older wells released before the Bossier play really started, you could see the increase in the number of sands and the thickness and the quality."

It was a bit of a head scratcher.

"I couldn't see any particular place they were coming from," Amoruso said,

"just coming over the edge (of the shelf)."

## Following a Hunch

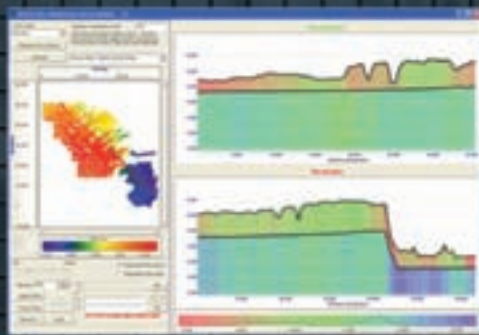
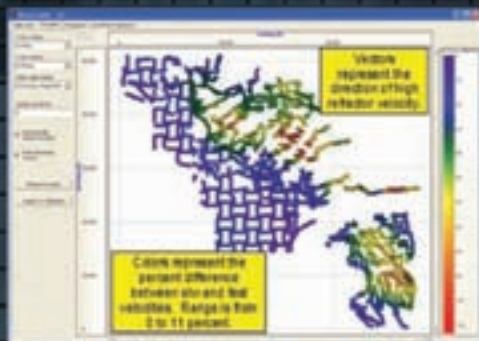
He determined the best place to look for a concentration of these sands – and where a turbidite fan might be developed – would be where he could find a good break in the Cotton Valley shelf.

"I thought I knew where that break was, that channel from which the sand should have flowed off the shelf and through that channel into the deeper water," Amoruso said. "And it turned out to be true.

"It flowed in pulses, and the Bossier section is primarily shale with independent sands," he added.

There were pulses of sand deposition that came through, which resulted in the

See **Discovery**, page 12



Seismic Survey in Severe Canyon  
Topography Showing Anisotropic  
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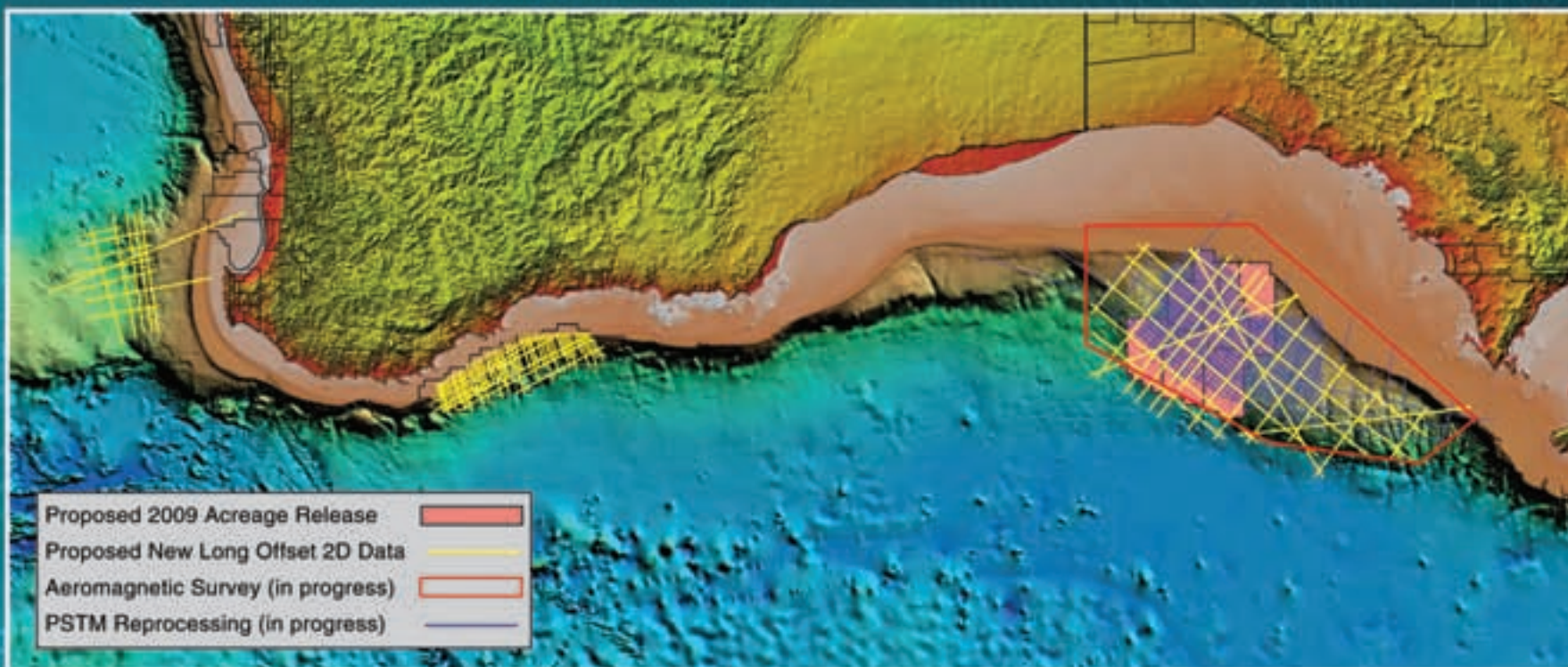
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Bathymetric image courtesy of Geoscience Australia. copyright Commonwealth of Australia

The Bight Basin is included in the 2009 proposed acreage release, to be officially announced at APPEA on May 31<sup>st</sup>. Geoscience Australia have recently published results from a geological sampling study, with promising evidence for a world class Cretaceous source rock in the Bight Basin. The data package provides a superior starting point for evaluation of this exciting frontier region.



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## Amoruso Activity

from page 8

### 'Spectacular World Class Field'

EnCana has conducted extensive seismic mapping of the Deep Bossier, enhanced its technical understanding of the geology, optimized drilling targets, lowered well costs and improved recovery rates, according to Jeff Wojahn, the company's executive vice president-USA region.

"In my opinion, the Deep Bossier might be the finest resource play in the entire industry in North America," Wojahn declared. "The Amoruso is a spectacular world class field."

Wojahn noted the Deep Bossier geological trend runs along the well-established Bossier shelf, which currently produces more than 1.4 Bcf/d of natural

gas.

Besides its other holdings in the play, EnCana estimates the acreage acquired from Leor contains about 200 net well locations, with each deep overpressured well currently tallying about \$10 million to drill, complete and tie in. Per well recovery is expected to range between eight Bcfg and 13 Bcfg. This translates into estimated ultimate recovery between 1.3 Tcf and 1.8 Tcf net after royalties.

Looking at the midpoint of this range, the company estimates full-cycle finding, development and acquisition cost of approximately \$3/Mcf.

EnCana's production from this East Texas resource play continues to ramp up rapidly.

"In the third quarter of November 2007, when we announced the Leor deal, we were producing 144 million a day from the East Texas play," said Alan Boras, media relations manager at EnCana. "In the same third quarter a year later, production had more than doubled to 340 million, with the Amoruso accounting for a large part of that."

Boras noted they anticipate a forecast to 420 million daily in 2009 for Amoruso and its other acreage in the play.

"This is an exciting long-life asset that is at the earliest days of development," said Randy Eresman, EnCana's president and CEO. "It has the potential to be the leading resource play in our North American portfolio."

Excellent geology is not the only thing the Deep Bossier action has going for it – it's located in a well developed oil and gas region that offers an established service sector, efficient state regulation and available midstream gas processing.

An added plus is the proximity to major pipelines having adequate transportation capacity and close to the country's trading hubs, including the Henry Hub in Louisiana.

EnCana noted the asset's location and infrastructure enables producers to capture some of the most attractive netbacks in North America. □

## Discovery

from page 10

sands being included and totally encompassed by the shale – "the shale," he said, "was the seal and the source."

"A lot of this was conjecture," Amoruso noted. "We had no seismic, no wells that proved it."

"It was a regional idea and the prospect was a regional dumping area for sands," he said. "If the sands are coming off and you're seeing them get better and more frequent and where there's a logical place for them to come off and be the best – that's what the concept was."

He commented that he expected the Bossier to increase in pressure along with an increase in reservoir quality in the deeper water in what he thought was the fan, which should result in good delivery, good production and reserves.

### Show Him the Money

With a miniscule amount of hard data to rely on, Amoruso outlined an area encompassing about 48,000 acres in Robertson County as a lease acquisition target, noting that he would have been even more aggressive if he had data that became available to him later.

Prior to leasing, however, financing had to be acquired.

Enter Guma Aguiar, who had managed energy assets for his family for some time.

"I had an idea, a concept and developed a nice relationship with Guma, who was a first-class person to work with, and he put up money as we needed it to buy acreage," Amoruso said. "When it came time to drill, Leor Energy was formed – with Guma as CEO – to drill the well in 2004."

The initial well in the Amoruso Field reached TD at 16,600 feet and was successful, albeit not to the extent anticipated. But major drilling successes in the deep overpressured Bossier soon followed.

In fact, the Amoruso Field – today owned 100 percent by EnCana – reportedly is considered to be one of the five largest U.S. onshore discoveries in the past 10 years.

Amoruso put the opportunity into perspective, saying that "the gift from God" essentially is:

- ✓ "The concept.
- ✓ "The ability to get financing when we had no money.
- ✓ "Them letting us do what we knew how to do to make an exploration play.

"The essential thing was the jump from the shelf to the deep," he noted.

Aguiar's monetary contribution showed he clearly had abundant confidence in Amoruso and his cohorts at Legends Exploration Co.

"They (Leor) had put \$20 million in the thing by the time we got the first well down," Amoruso noted. "It doesn't happen often with geologists with minimum data you can convince someone to put that much money in."

He doesn't rule out that it could happen again.

"When we formed Legends in 2002, we were looking for homerun gas prospects," Amoruso said, "and that's one of the ones we had."

"It's a once in a lifetime type of thing," he said, adding, "we're trying for it not to be." □



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*An intensive basic training***Boot Camp Offers Career Push Ups**

By SUSAN R. EATON  
EXPLORER Correspondent

“Geoscience boot camp” is not for the faint of heart.

Akin to basic training in a marine platoon, geoscience boot camp recruits are run through their daily paces by a group of seasoned instructors and mentors, and are pushed – often under tight deadlines – to make real-life business decisions with sub-optimal technical data.

Graduates emerge from the experience realizing that, in addition to honing their technical skills, teamwork is equally critical to their overall success.

Technically equipped with the “right stuff,” these young graduates – who represent the future of the oil and gas industry – hit the ground running as seasoned prospect generators.

More formally known as the “Geoscience Subsurface Interpretation and Mapping Certification Training Program for Geologists and Geophysicists,” this innovative training concept was developed over three years by Houston-based Subsurface Consultants and Associates (“SCA”), in response to shifting demographics and declining capabilities in training and mentoring within the oil and gas sector.

The inaugural group of seven recruits graduated in late November 2008.

At the end of the 12-week-long session in Houston – the first-of-its-kind to be offered to the oil and gas industry – these young geology and geophysics recruits (new graduates and recent-hires with less than three years of work experience) were ready to enter the work force or return to their current employers.

**‘Back to the Basics’**

SCA instructors and mentors described the over-arching theme of the geoscience boot camp as “going back to the basics.”

SCA’s program, they said, evolved out of ongoing discussions the company had with chief geologists, chief geophysicists and exploration managers from the oil and gas industry who indicated a critical need for new graduates and recent-hires to exchange the bells and whistles of computer workstations for colored pencils, rulers and calculators.

This was necessary, they said, to develop basic geological and geophysical interpretation skills that, in their collective industry opinion, the young professionals were generally lacking.

“The only way to learn these skills is to use your brain, and do the work by



Photos courtesy of Subsurface Consultants & Associates

These boots were made for walking: Participants of the SCA “geosciences boot camp” listened as Lans Taylor, during a trip to Pedernales Falls State Park, discussed the excellent exposures of Paleozoic (Pennsylvanian through Ordovician age) sediments subcropping Lower Cretaceous limestones at the Hercynian-age unconformity on the south margin of the Llano Uplift.

hand,” said one of SCA’s senior managers. “The students learned to interpret and loop-tie seismic lines, correlate well logs and generate a variety of subsurface maps; everything was done on paper.

“Once young geologists and geophysicists learn to think in geological terms,” he added, “they should be able to excel in the workstation environment, and make those workstations sing ten-fold.” SCA’s instructors and mentors said their generation had the advantage of acquiring fundamental geological interpretation skills before “migrating into the workstation world,” officials said.

“There are few computer generated maps,” they added, “that don’t need some type of hand-edited corrections.”

**Teamwork Pays Off**

The geoscience boot camp recruits

came from diverse backgrounds:

- ✓ A geophysicist from Sonangol, Angola’s state oil company.
- ✓ Geologists from El Paso Exploration & Production and Devon Energy.
- ✓ An AAPG Foundation scholarship recipient.
- ✓ An oil and gas investor.
- ✓ A geophysicist and a geologist (with an igneous petrography background) from a government agency.

More than half of this intrepid group temporarily relocated to Houston for the camp.

After completing six weeks of comprehensive technical courses, the recruits were divided into work teams and challenged to apply their newly honed skills – the basic principles of oil and gas geology and geophysics, and subsurface mapping techniques – to a real-life oil and gas project.

Their project area was situated in the

onshore Texas Gulf Coast, in the Frio Sand trend, and was characterized by classic listric faults and rollover structures, with offsetting analog fields.

During the six-week applied project, recruits developed the area from the lead stage through exploration drilling and full-scale field development – an exercise that could easily take a geoscientist a decade to complete in the industry.

As they advanced through this independent project, the teams evaluated progressively larger and more complex data sets (geological, geophysical and production engineering), and became skilled at interpreting and correlating paper well logs and paper seismic sections, and at hand-contouring data to generate time and depth structure, net sand, net pay, seismic marker and

See [Boot Camp](#), page 16



Basics instincts: Geoscience boot camp participants had plenty of time for intense classroom exercises to help make them more valuable players for their companies. From left, geoscience boot camp recruit John Neese, doing an interpretation exercise; SCA instructor and mentor Mangat Thapar with camp participant John Tackett; and Joe Dumesnil, AAPG Foundation Scholarship recipient, hand-contouring maps.

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## Boot Camp

from page 14

velocity gradient maps.

Because the technical data represented several real oil and gas fields, the teams got to compare and contrast their hand-generated interpretations against the historical dataset – toward the end of the project they compared their 2-D seismic interpretations against a 3-D seismic interpretation of the field that was generated on a geophysical workstation.

### Going Through a Phase

At each phase of the hands-on project, the teams presented their technical work, AFEs and business recommendations – based upon discounted cash flow analyses – to their oil company managers (SCA instructors and mentors), requesting additional money for the purchase of seismic data and for the drilling of exploratory and development wells:

- ✓ Phase 1: The initial exploration phase – the teams drill a discovery.
- ✓ Phase 2: Assess discovery – refine interpretation.
- ✓ Phase 3(a): Design field development plan.
- ✓ Phase 3(b): Search for additional prospects in and around discovery.
- ✓ Phase 4: Field performance analysis and study (jumping forward five years).
- ✓ Phase 5: Project report and present the results.

### Compressed Timetables

As a senior geophysical adviser with the international group at Devon Energy, Doug Ware's job description also

includes the formal mentoring of AAPG member John Tackett, a new-hire geologist who attended the inaugural geoscience boot camp.

Ware echoed SCA's rationale for developing the program:

"Hand contouring forces you to build geological models," Ware said. "We're hiring an entire generation that doesn't know how to generate geological models in their heads."

With respect to not teaching the basics of geological interpretation to students, graduates or recent-hires – whether at universities or E&P companies – he added: "Yes, we're doing them a disservice."

In the international arena, according to Ware, not all projects consist of digital databases, presenting a compelling case for geoscientists to be conversant in the interpretation of data in a paper format.

Despite the fact that Devon has in-house training and mentoring programs, he said, the company nonetheless saw the value of investing in Tackett, and paid the \$37,500-tuition to send him to SCA's camp for 12 weeks.

"The SCA program compressed an oil and gas career into a six-week project," said Ware, a 30-year industry veteran. "Typically, in an individual's career, he/she spends time in an exploration, development or production scenario."

"The SCA course had multiple levels of teaching," he added. "The students had deadlines, they had goals and they learned a few business rules as well."

El Paso Exploration & Production has an in-house, two-year rotational training program in which new-hires gain broad experience in exploration and development geology, and in production engineering. However, Stephen Gardner, manager of reservoir engineering

See [Training](#), page 18

## A Happy Benefactor

During geoscience boot camp participant Joe Dumesnil met his new mentor, AAPG member Stewart Chuber, a geological engineer and president of Texas-based Fayette Exploration Co. It was through Chuber's gift that the AAPG Foundation granted a scholarship earmarked to Dumesnil – an individual previously unknown to Chuber – to attend the SCA program.

When he heard about the geoscience boot camp during the summer of 2008, Chuber was immediately intrigued, recognizing that it was unique in the industry.

"I thought the program was terrific because it emulated real life," he said.

Chuber's contribution to the AAPG Foundation, stipulated that the selected



Chuber

student be chosen from one of his alma maters: Stanford University or the Colorado School of Mines.

"I figured that it would be far better for me, as a mentor, to sponsor an individual like Joe

than to sponsor a university; I thought that it would be a nice way to return something to the industry," said Chuber, who described how he had benefited immensely from mentorship during the early part of his career.

"Joe can now go out and generate prospects right away." □

## A Hard-Earned T-Shirt

EXPLORER correspondent (and AAPG member) Susan Eaton participated in the final two days of the geoscience boot camp. During these two days, Eaton interviewed all seven students as well as seven of SCA's course instructors and mentors.

Eaton attended each of the students' final presentations, which were delivered to their peers, team members, the SCA mentors and instructors, the AAPG scholarship benefactor and to their respective corporate managers and mentors.

"The audience was one tough crowd," Eaton said, "and asked some thought-provoking questions that were

answered by the students with the skill of seasoned prospect generators."

Eaton got to ask a couple of questions of the students, including her favorite one: "How much money did you make for the company on this exploration, development and production project?"

The answer, on a discounted basis, was \$56.7 million, with an IRR of 96.43 percent, and recoverable reserves of 72 Bcf of natural gas and 2.4-million barrels of condensate.

Did the students negotiate an override?

The collective answer: "We got the SCA T-shirt!" □

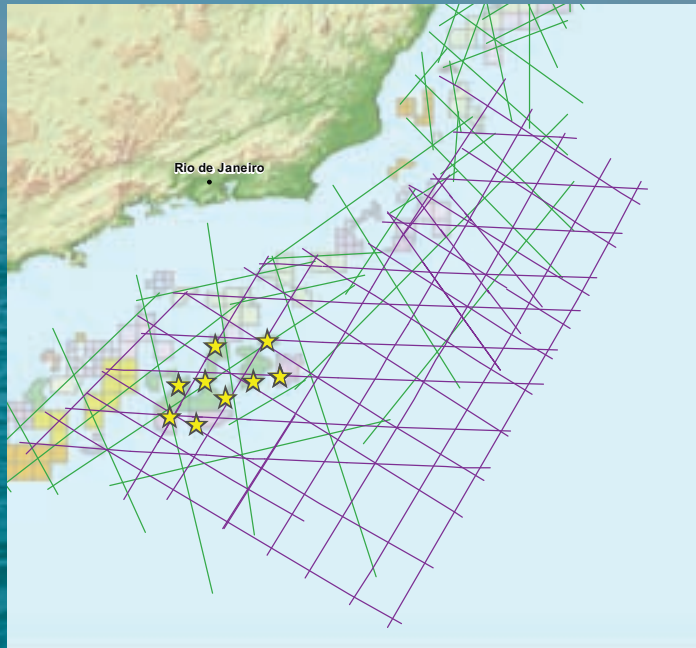
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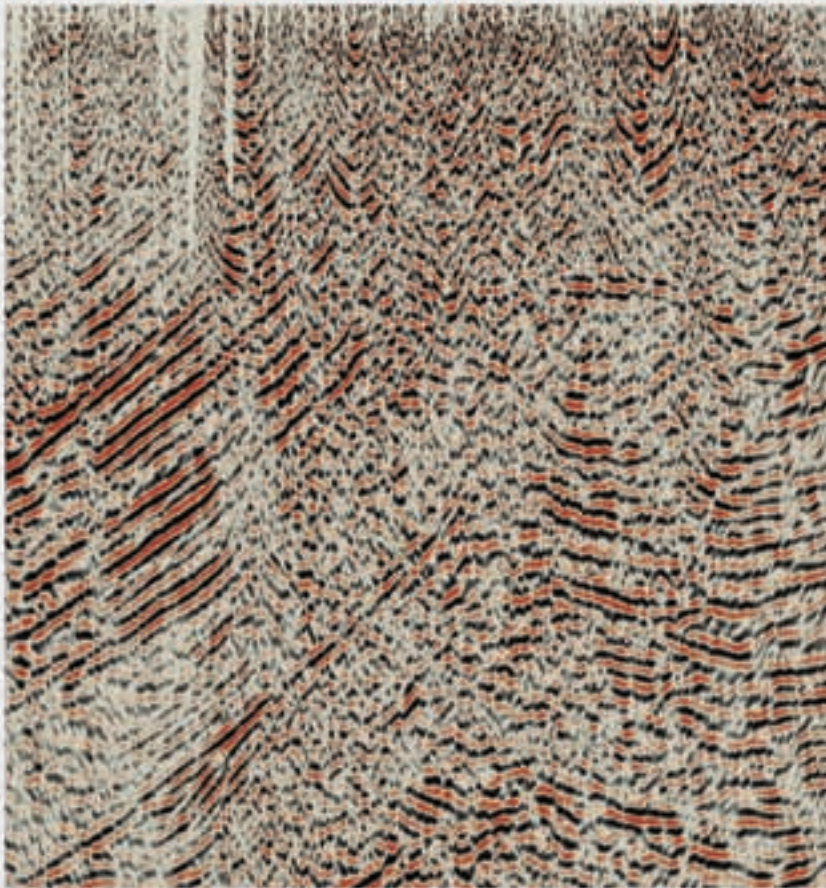
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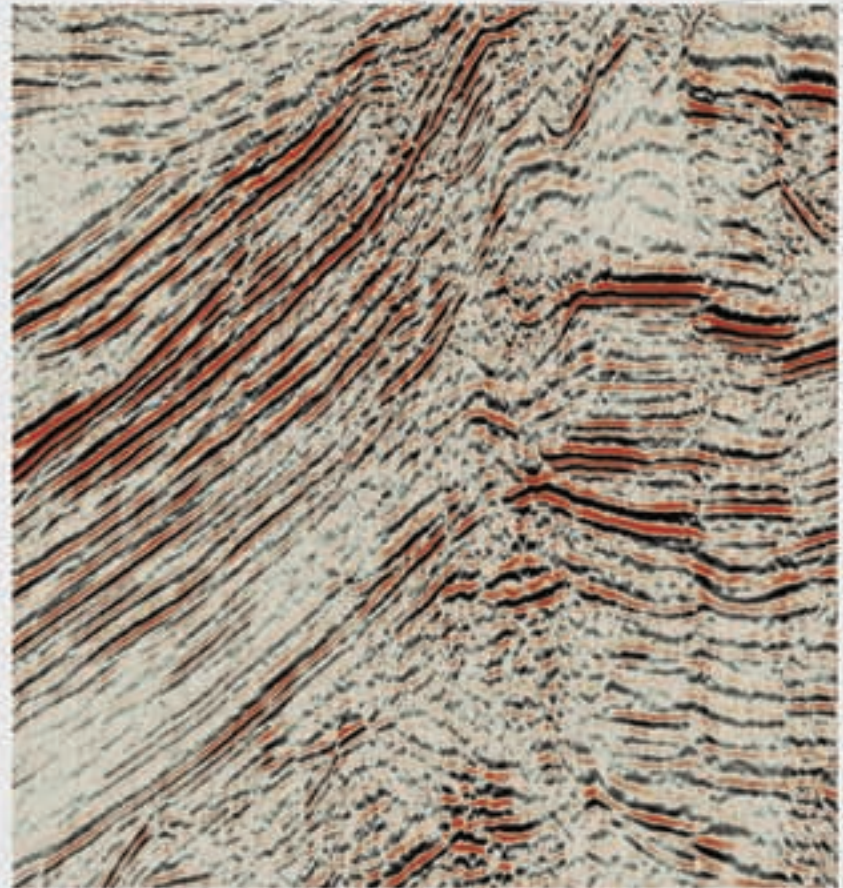


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Camp participants studied this unique exposure in the Upper Glen Rose Formation during a structural/stratigraphic field trip to the Texas Hill country – allowing the 3-D analysis of several normal faults that display a variety of characteristics and processes common to all normal faults systems.

## Training from page 16

evaluations at El Paso, sent Aysegul Basar, a junior geologist in his group, to SCA's boot camp in order to fast-track her training.

"Instead of going through the two-year rotation, she did it in three months," Gardner said.

El Paso's goal is to attract and retain the best and brightest geoscientists, he said, and investment in their training is a key component to this strategy.

"You've got to experience doing basic hand-calculations because, in the reserves group, the data bases are becoming large and people are making assumptions," he said. "We need critical documentation in our SEC reserves portfolio, not just pushing a button on a computer."

## Weekend Work, "Bonus" Trips

During the first six weeks of geoscience boot camp, the recruits attended a comprehensive series of classroom courses designed to provide them with the fundamentals of oil and gas exploration, development and production:

- ✓ Structural Styles in Petroleum Exploration and Development.
- ✓ Open Hole Log Analysis/Petrophysics.
- ✓ Seismic Survey Design, Acquisition and Processing.
- ✓ Principles of 3-D Seismic Interpretation, AVO and Attribute Analysis.
- ✓ Applied Subsurface Geological Mapping.
- ✓ Basic Reservoir Engineering for Non-Engineers.
- ✓ Fundamentals of Sequence/Seismic Stratigraphy.

Because SCA offered these seven courses to the broader oil and gas industry, the boot camp recruits had the opportunity to meet a wide cross-section of people during this formal lecture series.

Due to the compressed timelines of SCA's program – and the incredible amounts of material required to transform raw recruits into seasoned prospect generators – instruction sometimes spilled into the weekends: Camp recruits received some "bonus" courses, including traveling to the hill country of Texas to observe, at the outcrop scale, listric growth faults of the Balcones Fault System and sequence stratigraphy of the Austin Chalk.

At the microscopic scale, they studied rocks in a cuttings and core description course.

## 'Band of Brothers'

Equipped with a newly minted master's in geology from Oklahoma State University, John Tackett had spent just eight weeks in Devon's international exploration group before enrolling in SCA's program.

"I felt like I was back in the university," Tackett said. "The project put me into a real world interface, where you've got data problems, deadlines and distractions."

According to Tackett, the seismic data had multiples – and, in some cases, the wells didn't tie the seismic, necessitating the construction of velocity gradient maps and the incorporation of seismic strike lines into the interpretation.

Tackett was fortunate on two fronts: first, he had just graduated from a university, located in an oil-producing state, that had taught some of the materials and principles presented during SCA's boot camp; second, during the first eight weeks of Tackett's employment at Devon, Ware had given him an interpretation project to complete the old-fashioned way, by hand.

For the other geoscientists with diverse backgrounds, however, the technical materials and concepts presented by SCA were both new and challenging.

During the SCA program, both geologists and geophysicists – each with a couple of years of industry experience under their belts – learned that well data generally trumps seismic data in reliability. And, for the first time in their careers, the two geophysicists learned how to correlate wells to seismic lines.

"The camaraderie between the seven of us has been great," Tackett said of the teamwork and bonds that developed among the students. "We had some

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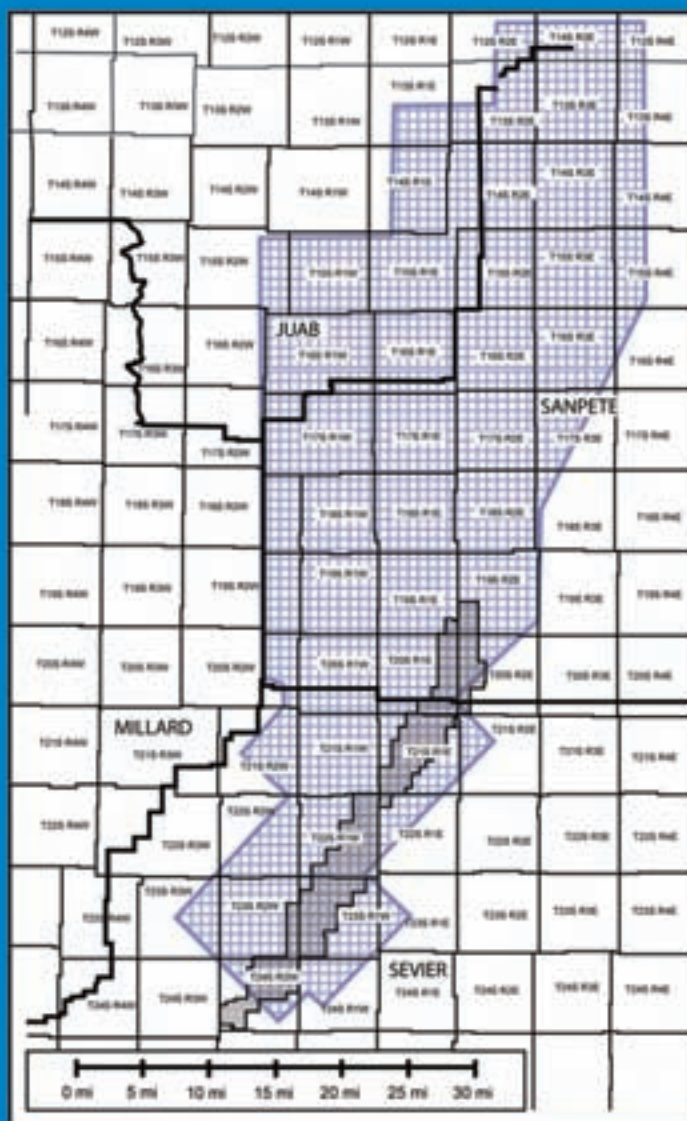
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See **Professionals**, page 20

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Road trips and road cuts are essential parts of the "boot camp."

## Professionals from page 18

laughs and some heated discussions."

During the six-week, hands-on project, geologist Gary Chapman was a member of SCA's oil company "management team."

Chapman, an AAPG member, also was one of several mentors to the student group – on a daily basis, he watched the teams compete against each other, and was heartened to observe these young geoscientists grow individually.

"They've been through mind-numbing, hard work," he said. "We threw a lot of stuff at these people over six weeks. It wouldn't have been a breeze for an experienced geologist – these were real fields with real complexities.

"These guys were like a band of brothers," he added. "Everyone took a lot of pride in their own individual results, and lifelong friendships were created."

### Cooperation and Fun

At age 56 years of age, John Neese doesn't fit the demographic profile for recruits for SCA's boot camp; nor does he fit the requisite academic profile, given that he had no previous geoscience educational background.

Neese, however, is no academic slouch – he holds degrees in electrical oceanographic engineering from the Massachusetts Institute of Technology and in business from the Harvard Business School.

"I'm an amateur amongst pros," he said of the unique niche he occupied during the SCA program.

According to Neese, once the other students stopped calling him, "sir," and, "weird Uncle John," he became a peer – just one of the students – despite his baby boomer status and diverse background.

"I accomplished my goals," Neese said, which were to develop the requisite skills to critically analyze investments in oil and gas deals.

"It's been fascinating and challenging to learn the different material and technical language, all at once," he added. "And, it's been fun to be around all of the 'young' people."

According to Neese, the "young" people helped him quite a bit. "There was a lot of cross-team cooperation and mentoring."

Neese was part of the two-man team called the "NeoGeos." His team member, AAPG member Joe Dumesnil, has a master's in mineral economics from the Colorado School of Mines and, most recently, a master's in petroleum economics and management from the IFP School in Paris, France.

"I felt the SCA program was going to be a great compliment to my graduate degree from France," he said. "I had a tool box – my aptitude – but no real oil and gas prospecting tools in it yet. I saw a chance in this program to grab some of those tools. I'm ready to launch my oil and gas career."

### What's Next?

The students weren't the only individuals who learned something during the inaugural geoscience boot camp – SCA's team of instructors and mentors have incorporated the students' feedback, tweaking and improving the program.

In 2009, SCA plans to offer the program twice, commencing March 9 and August 24, and hopes to attract 16 students for each session, enabling the establishment of eight, two-person teams for the applied project portion of the program:

For information go to [http://www.scacompanies.com/training\\_services/geosciences-certification-program.html](http://www.scacompanies.com/training_services/geosciences-certification-program.html).

"To date, the biggest negative response about the program," said one of SCA's senior managers, has been the oil companies' responses: "Can I afford to give someone up for three months?"

However, for oil companies without in-house formal training and mentoring programs – and even for larger E&P companies who have in-house capabilities – this question can be easily turned around:

Can the companies afford not to send their new-hires or junior geoscientists on a course that could kick-start their careers, transforming them into productive prospect generators in just 12 weeks? □

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## A top area to explore

## Elephants Beckon in North Africa

By DAVID BROWN  
EXPLORER Correspondent

You can see some camels in northern Africa, but you won't find a lot of elephants. As in the actual animal, of course.

When it comes to elephants of a hydrocarbon variety, the region is a fertile hunting ground.

In fact, oil companies voted those countries at the top of the list in Fugro Robertson's International New Ventures Survey last year (October 2008 EXPLORER).

Egypt was number one and Libya tied for second in exploration appeal, according to the annual survey of companies involved in E&P ventures outside the United States.

Tunisia ranked fourth and Algeria ninth, placing all four countries in the industry's Top Ten wish list.

North Africa might not have much to offer in the way of elephants – but there are still some big critters to be found.

A string of impressive successes, notable for tapping new horizons, put Egypt on the exploration radar in 2008.

Early in the year BP announced its Satis gas discovery offshore the Nile Delta in a joint holding with ENI.

That discovery was big enough to make the IHS top ten discoveries list of 2008 (see January EXPLORER).

In October, Apache Corp. reported it had established the westernmost production in Egypt's Western Desert with a discovery well in the Kalabsha concession. Apache said the well flowed 4,746 barrels of oil and 4.4 million cubic feet of gas per day from the Jurassic

**New interest in foreign investment and the lifting of political restrictions has increased industry interest in Libya, including the Sirte and Ghadames basins.**

Safa formation.

Then Texas independent IPR Group of Dallas recorded a Jurassic wildcat discovery in the northeast section of the Western Desert. Two drill stem tests showed a combined rate of 5,514 barrels of oil and condensate and 16.1 million cubic feet of gas per day.

## A Big Finale

And 2008 ended on a high note for exploration.

In December, Hess Corp. reported good discoveries offshore both in Egypt and Libya.

Then Arabian Gulf Oil Company and Libya's National Oil Corp. hit big in the Ghadames Basin. Their D1-NC7A discovery 500 kilometers south of Tunis tested more than 70 million cubic feet of gas and 2,400 barrels of oil per day from three levels of the Acacus sandstone formation.

All in all, it was a fine year for explorers in North Africa.

New interest in foreign investment and the lifting of political restrictions has increased industry interest in Libya,

including plans for drilling in the Sirte and Ghadames basins.

Intriguing exploration also continues in both northern and southern Tunisia.

Players in the Ghadames Basin in south Tunisia included Pioneer Natural Resources, which has made Tunisia one of its core areas.

Much of Pioneer Natural's drilling targeted Silurian objectives on the Jenein Nord block, east of the giant El Borma Field.

In northern Tunisia, Cooper Energy Ltd. of Perth, Australia, pushed exploration into its 100 percent-held coastal Bargou Exploration Permit area.

"The Bargou Permit essentially has two distinct plays in it. To the north are the Birsa/Souaf sandstone plays, which produce in the Tazerka, Oudna and Birsa Fields," said Conrad Todd, Cooper Energy exploration manager.

"These prospects have recoverable oil estimates in the 20 million barrel range," he noted.

To the south, and underlying the northern sandstone structures, are the limestone plays of the Bou Dabbous and the Abiod, he said.

"We have structures in the south with an areal closure of 90 square kilometers to 150 square kilometers. These are potentially very large, with recoverable oil estimates in the hundreds of millions of barrels, as they have potential for stacked reservoirs," Todd noted.

This year, Cooper Energy plans to acquire 2-D seismic data onshore Bargou and 3D seismic data offshore Bargou.

"We will try to squeeze an onshore well in at year end, and look to drill our first offshore well after that," Todd said.

Cooper Energy also has a 35 percent interest in the adjacent Hammamet Exploration Permit and is processing the 50 million barrel of recoverable oil Fuschia Prospect for drilling.

## 'An Overlooked Sibling'

Independents have found a hospitable exploration climate in Tunisia, partly because the average field size doesn't attract attention from the largest companies.

"It's a very attractive place for mid-size companies to grow their portfolio," Todd said.

Companies also are attracted by the compatible reputation of state-owned oil company Enterprise Tunisienne d'Activites Pétrolières (ETAP).

"Overall, I would characterize Tunisia as an overlooked sibling located between the big brothers of Algeria and Libya," Todd said.

"It has smaller fields and lower

See **North Africa**, page 28



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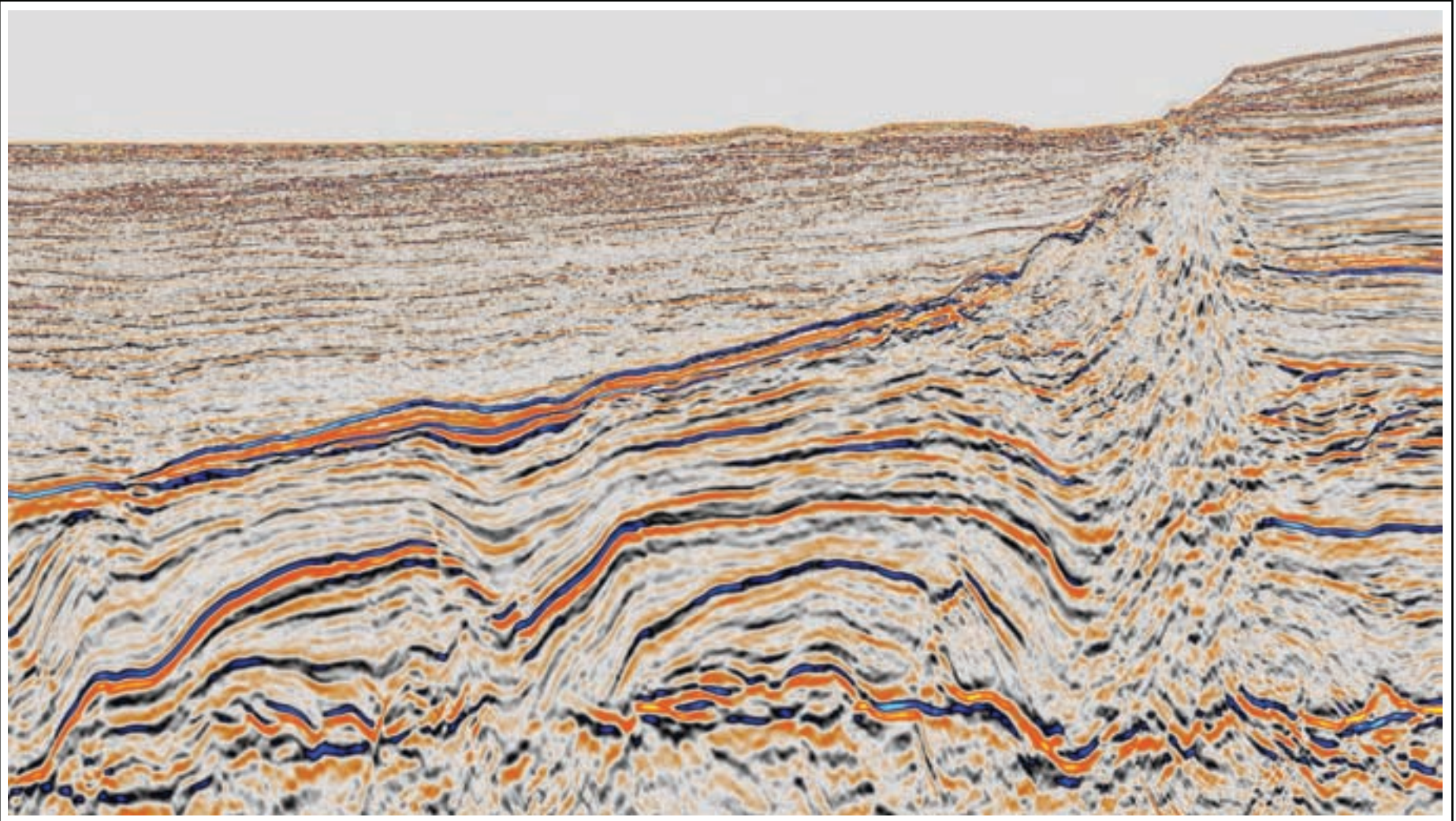
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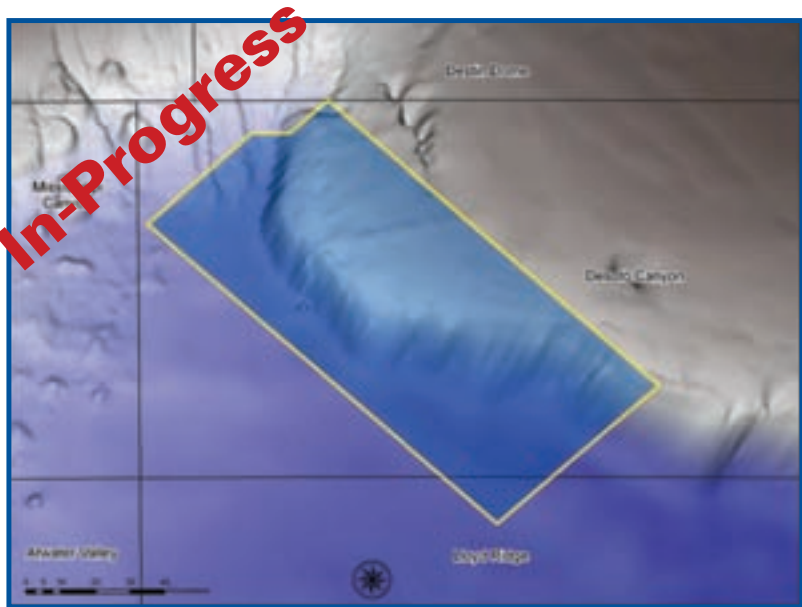
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*Right place, right time?*

# Algeria Sitting in a Sweet Spot

By DAVID BROWN

EXPLORER Correspondent

Few exploration stories are as complicated as Europe's interest in Algeria. The overall accounting includes Russian natural gas, long-distance pipelines, German utilities, Italian law, Algerian license rounds and many other details.

But the bottom line is clear: Europe wants gas supplies from Algeria, and that demand likely will fuel exploration for years to come.

A confluence of interests has created this favorable outlook for Algerian exploration:

- ✓ Algeria offers promising prospects, including plays in gas-prone basins.
- ✓ Algerian state gas company Sonatrach will try to increase its gas exports to 77.5 billion cubic meters in 2009.
- ✓ European countries want to diversify their natural gas sources and look to North Africa to supplement future supply.
- ✓ Algeria hopes to attract more foreign investment to speed development of its natural resources.
- ✓ Europe wants to avoid becoming overly dependent on Russian gas.
- ✓ Algeria has launched a number of gas-delivery and LNG projects that depend on increased production.

**A Cold Forecast?**

When Russia briefly curtailed its westward gas shipments through Ukraine in 2006, Europe got the sniffles and a headache. Same in 2007.

Then, when Russia cut off gas shipments in a dispute with Ukraine at the

start of 2009, Europe turned downright feverish.

Europe gets about a quarter of its natural gas from Russia – 80 percent of it shipped through Ukraine. European countries worry about the reliability of that supply – especially if Russian gas will be used to exert political and financial pressure.

German gas utility E.ON Ruhrgas followed the January events closely, because it draws 26 percent of its gas supply from Russia.

"Even if the dispute escalates further, there will be no cuts for our residential and commercial customers," said Bernhard Reutersberg, E.ON Ruhrgas chairman.

But, he added, "If the supply restrictions prove to be serious and long-lasting, and the winter turns out to be particularly cold, our means of offsetting the shortfalls will come up against limits."

The company emphasized the importance of the proposed Nord Stream Pipeline to secure future gas shipments.

The twin-line Nord Stream system would extend 1,200 kilometers from the Russian coast in the Gulf of Finland to Greifswald in northeastern Germany, carrying up to 55

**Exploration will target both structural and combination traps. More than 20 trillion cubic feet of gas already has been discovered in the Illizi Basin.**

billion cubic meters of gas per year under the Baltic Sea.

The venture is majority owned by Russian gas monopoly OAO Gazprom, with E.ON, BASF and Gasunie as partners.

**Alternate Routes**

While Nord Stream would help secure direct supply, it also would make Europe even more dependent on Russian gas.

One alternative will be available later in 2009, when the Medgaz Pipeline begins operation. The 210-kilometer system begins in Algeria's giant Hassi R'mel Field and links to the Spanish coast.

Construction of the pipeline is complete and final hydraulic testing should be completed this summer. Total delivery capacity will be about eight billion cubic meters per year.

A second eight billion cm/year pipeline, from Algeria to Italy, could be operational by 2012. An already-completed expansion has lifted capacity of the existing Algeria-Italy Trans-Mediterranean Pipeline to 33.5 billion cubic meters per year.

Now officially named the Enrico Mattei Gas Pipeline, the delivery system is

commonly known as the TransMed.

An Italian antitrust authority earlier fined Eni SPA for cutting competitors out of Italy's gas market by limiting available capacity on a Tunisian gas pipeline and the TransMed, and ordered more open access in the future.

**Promising Potential**

Increased delivery capacity will be academic unless new gas sources are found in the country.

In that regard, Algeria appears well-suited for exploration.

Separate U.S. Geological Survey studies of the Grand Erg/Ahnet Province in Algeria and Morocco, the Trias/Ghadames Province in Algeria, Tunisia and Libya and the Illizi Province in Algeria and Libya found good prospectivity for both oil and gas.

Hassi R'Mel lies within the Tanezzuft-Benoud petroleum system in the Grand Erg/Ahnet.

The province contains the Timimoun, Ahnet, Sbaa, Mouydir, Bechar and Abadla basins, part of the Oued Mya Basin and the Benoud Trough.

According to the USGS, the Silurian Tanezzuft formation and Middle to Upper Devonian mudstone are the region's principal source rocks.

Traps in this province are typically structural and associated with anticlines and faulted anticlines with origins in Hercynian deformation. Major reservoir rocks are Cambrian-Ordovician, Ordovician, Silurian, Devonian,

See **Algeria**, page 28



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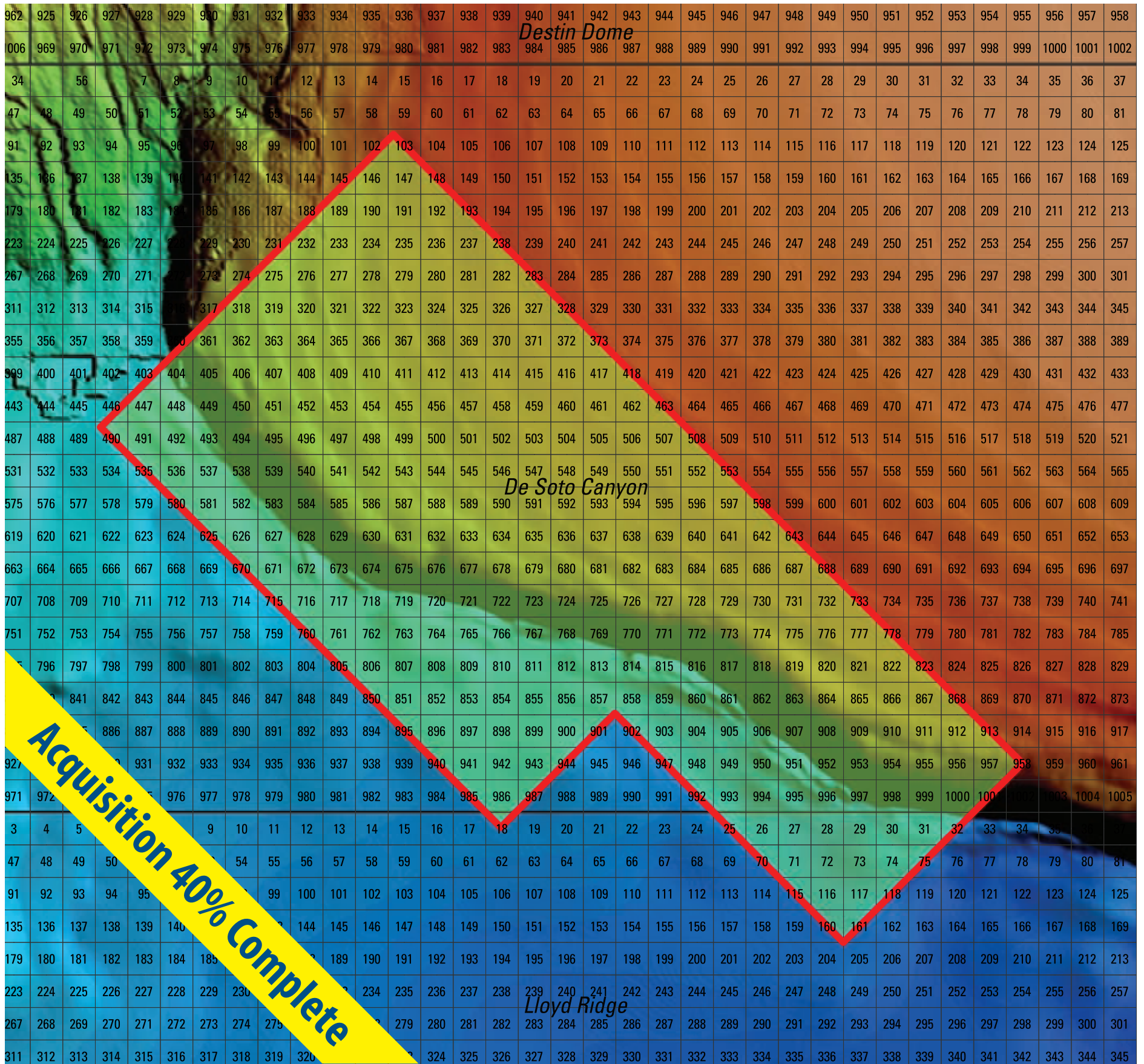
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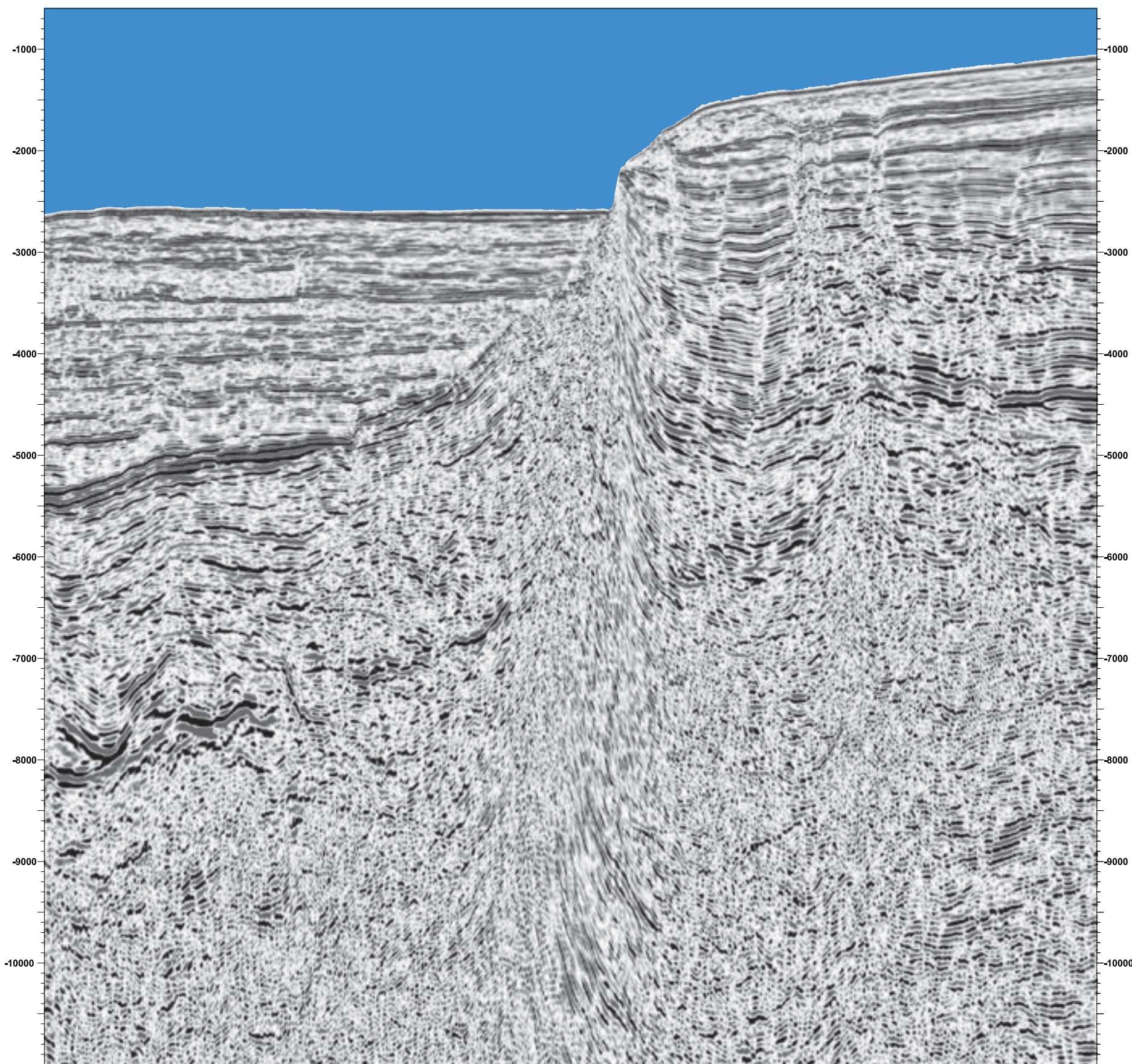


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## Algeria

from page 24

Carboniferous and Triassic sandstone, with Paleozoic marine mudstone as the primary seal.

Of the three province areas within Algeria, the 200,000 square kilometer Illizi Basin could hold the largest share of undiscovered gas resources, due mostly to a relatively favorable thermal history and high organic content of source rock.

Generation in the basin took place from the Middle to Late Jurassic to early Tertiary. Primary source rocks are Silurian Tanezzuft and other mudstones; reservoir rocks include Cambrian-Ordovician, Silurian, Devonian and Carboniferous sandstone.

Exploration will target both structural and combination traps. More than 20 trillion cubic feet of gas already has been discovered in the Illizi Basin.

Algeria is still struggling with development of its 9 Tcf Gassi Touil gas complex. Current plans call for an LNG production facility, increased pipeline capacity to the Hassi R'Mel hub and other production enhancements.

Sonatrach has abandoned its 2009 production targets for the complex, however. First LNG production is now scheduled for 2012.

### Winning Bids

In December, Algeria announced the winning bidders in its seventh upstream licensing round.

It awarded only four of the 16 offered licenses and blamed the global economic downturn and declining energy prices for suppressed interest.

But the license terms also carried stiff restrictions. Sonatrach retained at least a 51 percent equity share in future upstream contracts, and foreign producers faced a large tax burden.

Winning bidders were:

- ✓ Eni, awarded the Kerzak license in the Timimoun Basin.
- ✓ E.ON Ruhrgas, awarded the Rhourde Yacoub exploration permit in the Berkine Basin, the Algerian extension of the Ghadames Basin.
- ✓ BG Group, awarded the Guern Gueessa license in the Gourara Basin in southwest Algeria.
- ✓ Gazprom, awarded rights in the El

Assel area of the Berkine Basin.

"We see very significant exploration potential in the permit that could give rise to long-term gas supplies for E.ON Ruhrgas customers in Europe," Reutersberg said.

"Algeria is a strategically important partner in this respect," he added.

Gazprom said it will invest about \$120 million in geological exploration at El Assel, including the acquisition of 2,500 square kilometers of 3-D seismic and drilling of four exploratory wells.

Much of the industry took the tepid interest in Algeria's recent bid round as a negative sign for exploration.

But as recent events have shown, Algeria could be in just the right place for renewed exploration activity, at just the right time. □

## North Africa

from page 22

production than the adjacent countries, but the fiscal regime reflects that and the Tunisian authorities are generally very good to work with," he added.

OMV is one of the larger explorers active in southern Tunisia. The company has made four consecutive discoveries in the Jenein Sud exploration permit area, where it shares a 50-50 interest with ETAP.

Its most recent discovery well tested at 1,200 barrels of condensate and 58 million cubic feet of gas per day from several layers at about 12,150-13,000 feet.

Ongoing exploration is tied to a 3-D survey of the permit area, expected to be complete by the beginning of 2009.

Historically, exploration interest in Tunisia has centered on the Ghadames Basin in the south and the Gulf of Gabes to

the northeast.

The Ghadames extends from western Libya across Tunisia and into Algeria, where it is known as the Berkine Basin. Like many other plays in northern Africa, it has a reputation for steady but somewhat slender exploration prospects.

In a presentation at the 2007 AAPG Annual Convention and Exhibition, a group of Anadarko Petroleum geoscientists presented an overview of Ghadames resources. They estimated the basin's Paleozoic-sourced, Triassic reservoir system contained less than a billion barrels of undiscovered reserves.

Also, they predicted that the reserves will be distributed in fields of less than 200 million barrels.

Allan Driggs, an AAPG member who is Anadarko senior geological adviser, was a co-author for the study. He said an earlier USGS resource assessment of the Ghadames was "rosy."

"The lower sandy-shaly Triassic unit

thins out on the edges and the facies thins out considerably to the northwest, where it's considerably less prospective," he noted.

But "it's still a very viable province," he added. "The fields are really good for their size."

### Higher Profile in Algeria

ENI raised its profile in Algeria substantially in September when it agreed to acquire Calgary-based First Calgary Petroleum. That company held an interest in Algerian fields with reported combined resources of around 1.3 billion barrels of oil equivalent and a large amount of prospective gas production.

(See related story, page 24.)

The real objective for most European companies operating in northern Africa is a secure and abundant supply of natural gas. Algeria has an estimated 161.2 Tcf of proved gas reserves, according to the U.S.

Energy Information Agency.

By comparison, Egypt has an estimated 67.4 Tcf of proved gas reserves and Libya 51.7 Tcf.

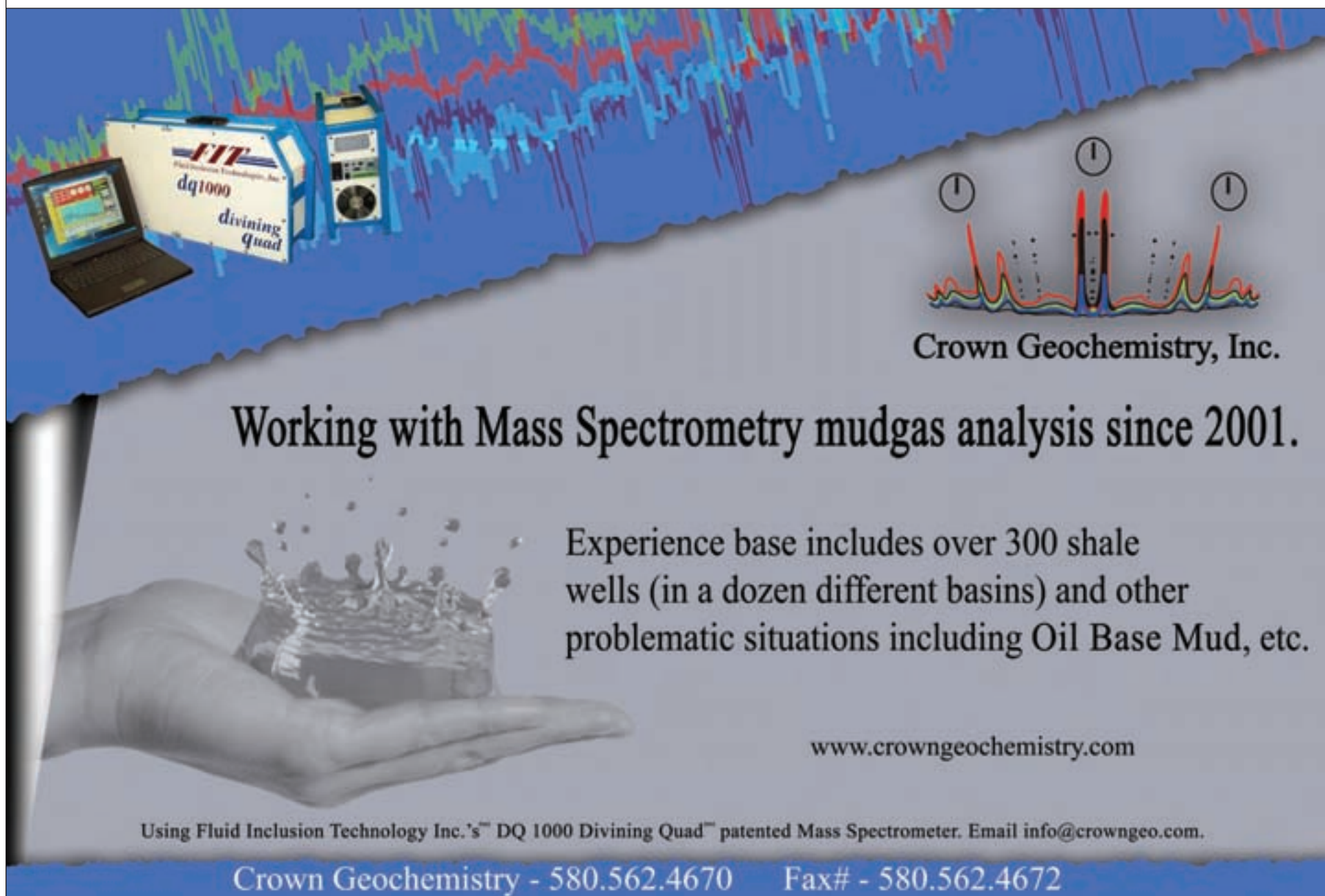
BP, StatoilHydro, Total, Repsol, Anadarko and Amerada Hess also have been involved in exploration and production in Algeria.

A mix of large players and medium-sized independents are staying active in North Africa from western Algeria to the Gulf of Suez. While recent successes have focused attention on Egypt and Libya, attractive prospects are available in every country.

Russian company OAO Gazprom might already have found a prize in African production.

Last year it angled to acquire a 33 percent interest in a Libyan oil field producing more than 125,000 barrels per day.

The field name? Elephant. □



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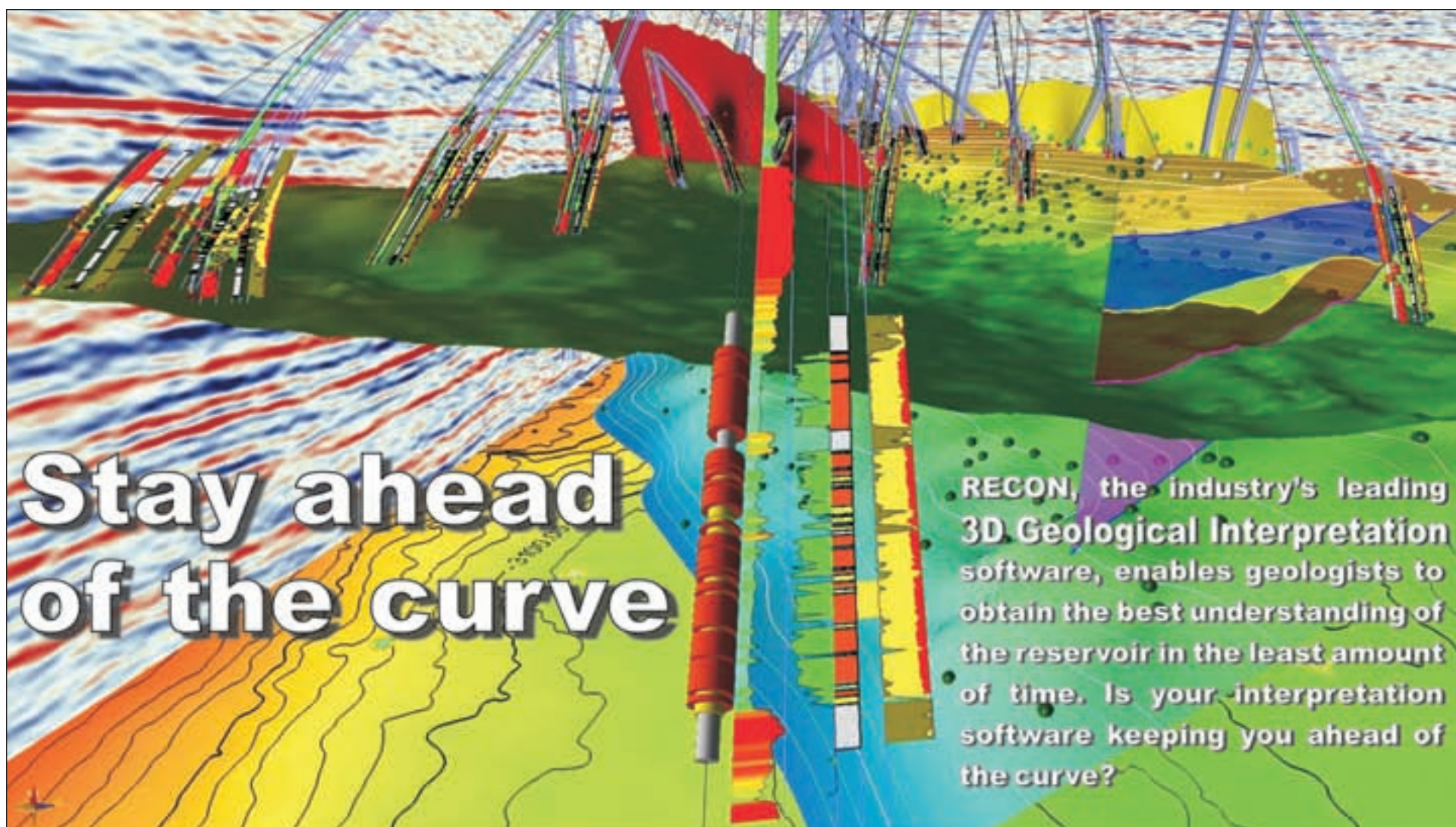
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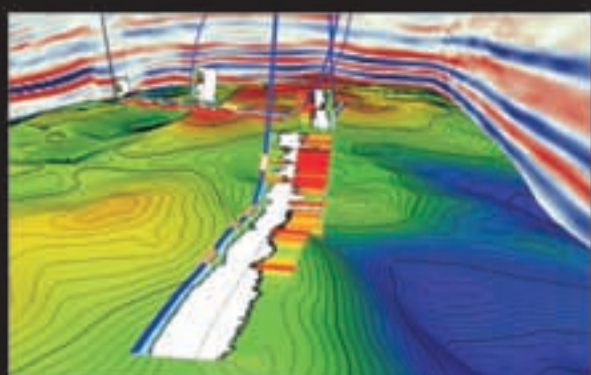
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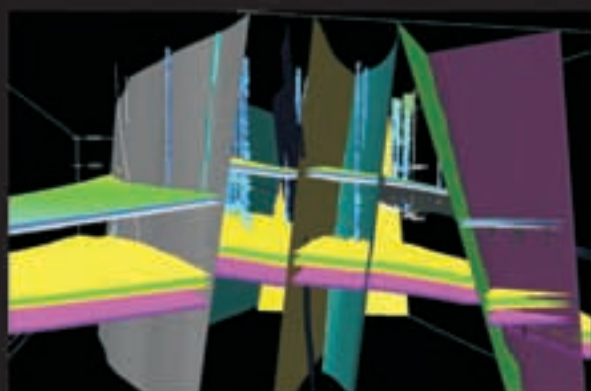
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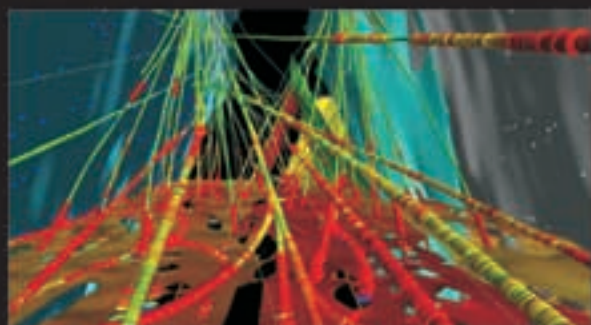
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## Hurricanes come with the territory

# Gulf Rigs Have to Take Punches

By LOUISE S. DURHAM  
EXPLORER Correspondent

The U.S. Gulf of Mexico has long been the mainstay of domestic oil and gas production, currently accounting for about 25 percent of the nation's oil supply and 15 percent of domestically produced natural gas, according to the Minerals Management Service, the agency charged with offshore oversight.

But there's a dark side to the GOM that can be incredibly challenging to the industry.

This is a region that might best be dubbed "Hurricane Central."

MMS Gulf Scorecard, Early January						
Districts	Lake Jackson	Lake Charles	Lafayette	Houma	New Orleans	Total
Platforms Evacuated	1	13	11	9	0	34
Rigs Evacuated	0	0	0	0	0	0
Oil, BOPD Shut-in	1,228	4,780	42,089	91,501	3,934	143,532
Gas, MMCF/D Shut-in	98	239	374	293	104	1,108

As the industry knows all too well, the highly productive hydrocarbon province is a frequent target for

powerful hurricanes that create all kinds of turmoil for oil and gas interests. For starters, damage/destruction of

rigs and platforms is essentially a given. But there's also the expense incurred by the industry to shut down production before anticipated hurricane-force winds, along with enormous waves and tidal surges move in with the potential to cause other kinds of damage, such as pipeline breaks, etc.

Perhaps to make up for a quiet storm season in 2007, Mother Nature socked the Gulf big-time in 2008 when Hurricane Gustav roared across the area in September, followed only a few weeks later by the exceptionally widespread Hurricane Ike, dealing a one-two punch to the industry and the coastal towns.

But ever since the infamous Hurricane Katrina and follow-up storm Rita created substantial damage to industry infrastructure in 2005 – yet causing nary a single significant oil spill – the companies have worked diligently to minimize the vulnerability of their Gulf operations.

### Planning Pays Off

Despite encompassing darn-near the entire Gulf, Ike had a lesser impact than the '05 storms for a couple of reasons:

- ✓ It was less intense than Katrina.
- ✓ Most of the facilities destroyed were smaller, older platforms in the shallow Gulf waters rather than in deep water, which is home to the bulk of the GOM production.

✓ The oil industry has made significant improvements, particularly reinforcing offshore structures.

"We revised standards put in place for both new and existing structures," said MMS public affairs officer Eileen Angelico. "It was a joint effort from MMS, API and other members of the oil and gas offshore industry who worked together to identify places where standards could be revised and updated."

In reviewing the 2008 hurricane season, the MMS and others noted a definite success with mobile offshore drilling units (MODUs), in particular.

"MODUs that previously had to have eight mooring lines were now required to have 12 and, in some cases, 16 mooring lines," Angelico said. "In '08, 18 moored MODUs were in the path of hurricane force winds, and two went adrift, which represented 15 percent of

continued on next page

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## Smith Paper Wins Eastern Levorsen

Langhorne B. "Taury" Smith, with the New York State Museum's reservoir characterization group, Albany, N.Y., has won the A.I. Levorsen Award for best paper at the Eastern Section's 2008 meeting.

Smith's paper was "Hydrothermal-Seawater Mixing Zone Dolomite: A Hypothetical Model for Widespread, Pervasive Dolomitization."

His co-author was Graham Davies, with GDGC Ltd., Calgary, Canada.

Smith will receive his award at the Eastern Section's next annual meeting, set Sept. 20-22 in Evansville, Ind. □

continued from previous page

the rigs out there. In Katrina and Rita, 63 percent of the rigs went adrift.”

#### Weathering the Storm

Recent information released by the MMS regarding Gustav and Ike confirms that the oil and gas industry proved itself an efficient business.

As of mid-December 2008, personnel were reported evacuated from a total of 45 production platforms, equivalent to 6.5 percent of the 694 manned platforms in the GOM, the agency noted. There are no longer any evacuated rigs.

As part of the evacuation process for approaching storms, the safety valves below the ocean's surface are closed – either onsite or remotely – to prevent the release of oil or gas. During Gustav and Ike, as well as the earlier Katrina and Rita, the shut-in valves functioned 100

percent of the time, closing in production from the wells and preventing any major spills from the Outer Continental Shelf projects.

In its December 2008 Gustav/Ike activity statistics update, the MMS noted operators' reports indicate that approximately 14.1 percent of the Gulf's oil production is shut in – estimated oil production from the GOM was 1.3 MMbo/d as of June 2008.

The agency commented about 19.7 percent of the natural gas production is shut in – estimated gas production was seven Bcf/d effective June 2008. However, gas from the Independence Hub facility has increased, serving to bump current production up to an estimated 7.4 Bcf/d.

Shut-in production info included in offshore operators' daily reports is based on what the operator expected to produce that day, the MMS noted.

Therefore, the shut-in production figures

are estimates, which the agency compares to historical production reports to ensure the estimates follow a logical pattern.

#### Final Scorecard

Effective August 2008, there were more than 3,800 production platforms in the Gulf, ranging in size from single well caissons in 10 feet of water up to a large, complex facility in 7,000 feet of water. The MMS estimates about 2,127 production platforms were exposed to hurricane conditions from Gustav and Ike, carrying winds greater than 74 miles per hour.

Final results of the agency's assessment of destroyed and damaged facilities from these two storms indicate that 60 platforms were destroyed. These included some platforms that had been reported earlier to have extensive damage.

In comparison, 115 platforms were destroyed by the Rita-Katrina wallop in 2005.

The platforms designated as destroyed following Gustav and Ike produced 13,657 barrels of oil and 96,490,000 cubic feet of gas per day, or 1.05 percent of the oil and 1.3 percent of the gas produced daily.

The MMS noted that 31 platforms having extensive damage following Gustav and Ike could require three-six months to repair. "Extensive" damage could include underwater structural damage or major damage to pipelines moving the hydrocarbons to shore.

Ninety-three platforms suffering moderate damage, e.g., major topside damage to critical process equipment such as the platform's compressor or damaged risers or flex joints where pipelines connect to the platforms, may require one-three months to repair, according to the agency. □

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## WASHINGTONwatch

## Reserves Disclosure Rules Revised

By DAVID CURTISS  
GEO-DC Director

On Dec. 29, 2008, the U.S. Securities and Exchange Commission (SEC) announced that it was revising and updating its disclosure rules for oil and natural gas reserves.

Oil and natural gas professionals have been urging the SEC to modernize its disclosure rules for oil and natural gas reserves for many years. The principal criticism of the original rules is that they were introduced more than a quarter century ago, and were not updated regularly to remain current with industry practice and technological advancements.

The result was an increasing divergence between the information investors and the market wanted and what companies could disclose in their official SEC reports.

The vote by the bipartisan commission to adopt the amendments to the disclosure rules was unanimous, and completes a process that has taken more than a year.

It began after AAPG and the Society of Petroleum Engineers held the Interdisciplinary Reserves Conference in Washington, D.C., in June 2007 (August 2007 EXPLORER) with a Concept Release issued the following December, in which the SEC solicited feedback on a host of specific questions relating to reserves disclosure.

Based on this feedback, the SEC developed a proposed rule (actually a series of amendments to the current rule) that it offered for public comment in June

In order to prepare AAPG members for changes to disclosure rules for oil and natural gas reserves, a Geoscience Technology Workshop will be held jointly with the Petroleum Technology Transfer Council at the 2009 AAPG Annual Convention and Exhibition in Denver, titled "SEC Reserves Reporting Rule Change in 2010: Find Out How They Apply to You."

Watch for details in the upcoming convention announcement, or e-mail educate@aapg.org for more information. □



Curtiss

2008. The SEC then used this additional feedback to develop the final amendments that the commission adopted in December 2008. In announcing the changes to the disclosure requirements, SEC Chairman Christopher Cox said, "These updates to the SEC rules will help ensure more meaningful and comprehensive disclosure of information that, even though it does not appear on a company's balance sheet, is of significance to investors in making informed investment decisions."

\* \* \*

AAPG provided comments and feedback throughout the process, as did many of our sister societies.

In our comments, AAPG urged the SEC to adopt the principles set out in the Petroleum Resources Management System – a set of guidelines and definitions for managing petroleum resources, prepared by the Society of

Petroleum Engineers Oil and Gas Reserves Committee jointly with AAPG (represented by Ken Mallon), the World Petroleum Council and the Society of Petroleum Evaluation Engineers.

In many cases the SEC agreed with this suggestion, indicating repeatedly how the new disclosure requirements conform to PRMS guidelines.

The complete final rule can be downloaded on the SEC Web site, but several major changes include:

- ✓ Use of 12-month average price, instead of a single-day, year-end price, in determining the economically producible volume of oil and natural gas classified as "proved reserves."

- ✓ Inclusion of bitumen extraction and other non-traditional resources as oil and gas producing activities covered under the revised disclosure rules. The determinant of whether a particular non-traditional resource can be included as oil or natural gas reserves is based on final product. Thus, coal intended to be converted to oil and natural gas would be included, while other coal reserves would not.

- ✓ The revised definition of "proven reserves" permits the use of new reliable technologies in determining reserve

volumes and enables the booking of reserves outside traditional spacing areas, which is particularly important for resource plays.

- ✓ The concept of "reasonable certainty" is central to the revised definition of proved reserves, and follows the PRMS. It permits the use of deterministic and probabilistic methods in meeting the standard.

- ✓ Uses a principles-based definition of "reliable technology" that permits a broader portfolio of technologies to estimate and categorize proved reserves. Enabling the use of new technologies, once they are established as reliable, is a significant step to ensuring that these new disclosure rules will remain current.

- ✓ The SEC will now permit (but not require) disclosure of probable and possible reserves.

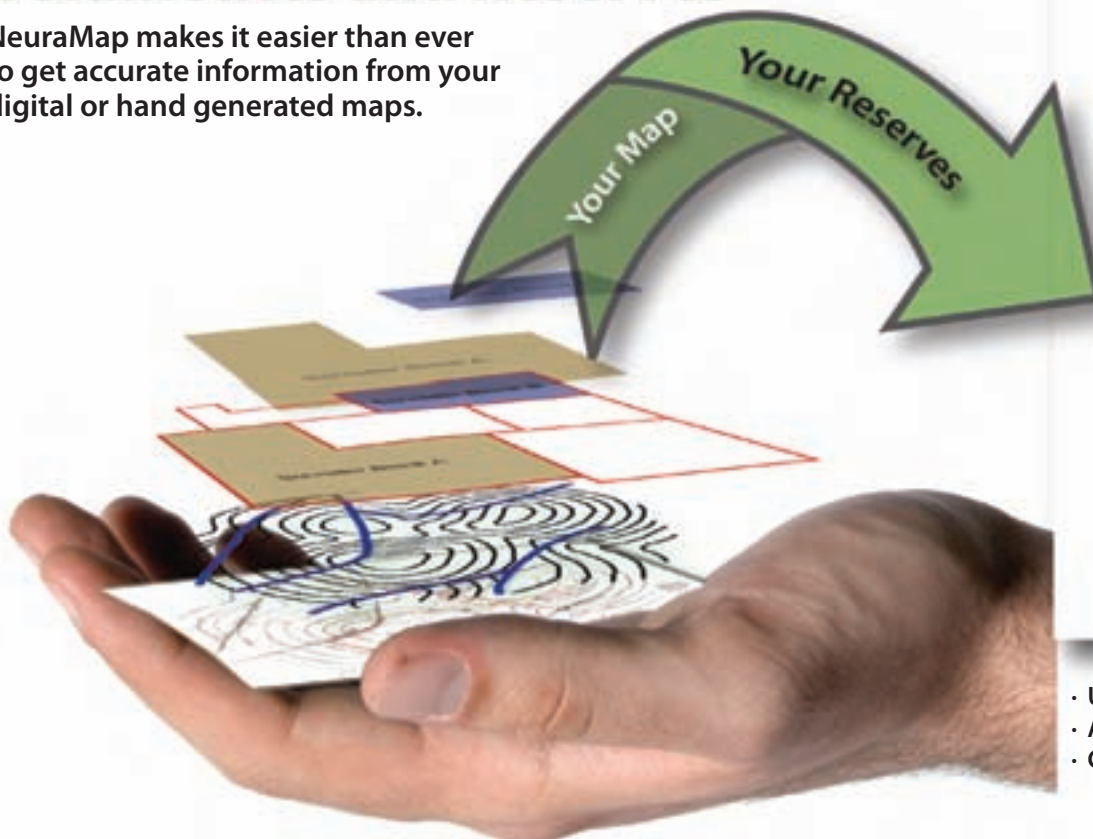
"It is gratifying to see the SEC make these changes to its disclosure requirements, and I congratulate and thank the many AAPG members and members of other professional associations who helped develop and communicate the PRMS principles," said Peter R. Rose, a former AAPG president, co-chair of the reserves conference and chair of the AAPG ad hoc committee on SEC response.

"The new disclosure rules demonstrate how scientific excellence and professional, ethical conduct in a regulatory context directly benefit society," Rose continued. "Our challenge now, as a scientific and professional association, is

continued on next page

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3	Field C	300	3000000	3000000
4	Field D	400	4000000	4000000
5	Field E	500	5000000	5000000
6	Field F	600	6000000	6000000
7	Field G	700	7000000	7000000
8	Field H	800	8000000	8000000
9	Field I	900	9000000	9000000

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**SPOTLIGHT on...**



Outgoing *Search & Discovery* Editor John W. Shelton, left, and successor Edward A. "Ted" Beaumont at a luncheon honoring Shelton's contributions to AAPG's digital program.

**Beaumont named successor**

# Shelton Bows Out As Editor of S&D

By LARRY NATION

**AAPG Communications Director**  
John W. Shelton, the godfather of AAPG's online e-magazine *Search and Discovery*, has retired after serving as its chief editor since its inception in 1997.

Succeeding Shelton as editor effective in January is Edward A. "Ted" Beaumont, Tulsa independent and current AAPG elected secretary.

A past AAPG Elected Editor and vice president, Shelton has been a strong supporter of the AAPG Foundation and was a key visionary in the planning and implementation of AAPG Datapages in the early 1990s. AAPG's Datapages is the Association's digital library and publishing program. Additionally, Shelton is a leader in the continuing growth of the AAPG digital library, which now includes data in Geographic Information Systems formats.

Datapages has since grown into the Association's major conduit to disseminate scientific information and continues its expansion (see page 38).

*Search and Discovery* began as an online research and demonstration project in 1997 and has grown into a leading information Web site and has been open to the public since its launch.

Both Shelton and Beaumont along with AAPG staff member Ron Hart are credited as being the originators of S&D, realizing that AAPG was capturing only about 10 percent of the output of its paper and poster presenters.

*Search and Discovery* provides a place to rapidly publish abstracts, luncheon talks, classic company reports and much of the miscellaneous material that was missed by other more formal publication media.

It's earned its place as an important part of AAPG's technical publications mix – and the numbers show that members approve.

At a headquarters luncheon honoring Shelton for his longtime efforts, it was announced that the AAPG Foundation has established the John W. Shelton Search and Discovery Award to be given annually to the author of the best contribution to *Search and Discovery* during the past year.

AAPG Executive Director Rick Fritz noted "there is no member in the history of AAPG who has dedicated and donated more of his time and expertise to scientific efforts of the Association than John Shelton. He is one of a kind, and the Association owes him our gratitude."

Shelton, in addition to being Elected Editor for the AAPG BULLETIN 1975-79 and AAPG vice president in 1988-89, also received AAPG's Distinguished Service Award in 1980 and Honorary Membership in 1990.

Since S&D was launched Beaumont has continued to be actively involved in the online journal, serving on the editorial board that seeks, solicits and approves new articles to be posted online. Others on the board are Hart, Doug Peters and Mike Horn. □

February 2009

## Midland Valley



## Structure World

Welcome to February's edition of *Structure World*. This month we introduce the new members of our Geo Team for 2009 and we have two examples of applications of Move.

### Meet the new members of the Geo Team

Several new faces have joined our geology team in Glasgow over the last few months:

**Anne Domzig** has a PhD in Marine Geoscience from the University of Brest, and has worked on the structure and active compressional tectonics of the northern Algerian margin.

**Arne Scherrenberg** obtained his MSc in Structural Geology and Tectonics from Utrecht University and has recently completed his Ph.D. at the University of Queensland, entitled "Structural framework of mineralisation, Marañón fold thrust belt, Peru".

**Matthias Auer** studied at the University of Karlsruhe (Germany), obtaining his diploma in 1998 and then completing his PhD in 2001. Both dealt with the structure and kinematics of the Northern Calcareous Alps in the Transalp profile.

**Ruth Wightman** completed her PhD in Structural Geology at Victoria University of Wellington in 2005. Recently she completed a two-year post-doc at Durham University, where she was using terrestrial laser scan data to build 3D fault and fracture network models of reservoir outcrop analogues.

**Ryan Shackleton** returns to Midland Valley after finishing his PhD at the University of Massachusetts where he used syn-tectonic strata and fracture studies to constrain 3D geomechanical restorations of Sant Corneli anticline (Spanish Pyrenees). At Midland Valley, he will continue developing 4DRestore and work on projects related to geomechanical restoration and fracture prediction.

**Tim Rice** joins after completing his MSc in Petroleum Geoscience from Royal Holloway College. His thesis involved numerically modelling the influence of tectonics on the deposition of channel-levee complexes within turbidite systems using 4DSediment.



They join our existing team of structural geologists which includes Alan Gibbs, Armelle Kloppenburg, Clare Bond, Dominique Similox-Tohon, Francesco Borraccini, John Grocott, Roddy Muir, Rosa Polanco-Ferrer, Serena Jones and Zsolt Schleder.

Other new members of staff in our Glasgow office include Andrew Berry (Systems Administrator) and Fiona Hunter (Geo Technical Author), while Colin Dunlop becomes Director (formerly Principal Software Engineer).

Are you interested in becoming a member of our team? Email your CV to [jobs@mve.com](mailto:jobs@mve.com).

### Interpreters Tip: Assessing the sequence of mini-basin infilling from restored palaeo-seafloors

Palaeo-seafloor restorations provide a surface topography from which basin accommodation space, spill points and sediment transport routes can be assessed.

Backstripping and decompaction using the Sclater & Christie (1980) equation allows compaction related deformation to be removed. The effects of flexural isostasy must also be considered across a regional scale. Horizons displaced by faulting should be restored as they are exposed. Across a restored palaeo-seafloor sediments from a point source will flow down dip and accumulate at the lowest point until a spill point is reached. Multiple sources may feed several mini basins with sediment bypass occurring as accommodation space is depleted.

The Hydrocarbon Systems tool in 3D Move provides a detailed analysis of these inter-basin flow paths and the progressive fill of depo-centres. 4DSediment models turbidity current deposition across these surfaces, allowing much higher resolution analysis.

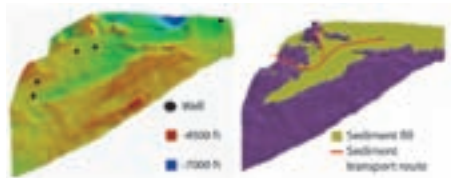


Image on left illustrates depth map of horizon at time of deposition of Buzzard sand. Image on the right shows sediment accumulation after addition of 500ft of sediment.

### Fugro NPA become our latest Move commercial client

Following recent opportunities to explore more remote and poorly mapped frontier basins and fold-belts, Fugro NPA (FNPA) have decided to integrate Midland Valley's 2D Move and 4D Move software components into their workflow to add extra dimension and linkage to their interpretation techniques portfolio.

2D Move will allow FNPA to integrate their surface mapping methodologies with the ability to use the data to build downwards into the sub-surface with far more structural control and confidence: "We see that companies need to have more than just a map" says FNPA Chief Geologist, Mike Oehlers, "and Midland Valley's Move suite allows us to present our interpretations and ideas to them in a validated and well established format".

Find out how you can integrate **Move** into your workflow. Email [help@mve.com](mailto:help@mve.com).

### 2009 Technology Meeting "Structural Geology in Uncertain Times"

15 - 16 Sept 2009, Glasgow (UK).

Papers are invited from all areas of structural geology. Sessions will cover the oil and gas industry; mining applications; and academic teaching and research.

Abstract deadline 30th April.  
Email [events@mve.com](mailto:events@mve.com).

continued from previous page

to ensure that our members who are engaged in preparing and complying with these new rules can do so properly and effectively."

The SEC has set an effective date for the new rules of Jan. 1, 2010, and

companies may not adopt the new disclosure requirements any sooner. □

(Editor's note: David Curtiss, head of AAPG's Geoscience and Energy Office in Washington, D.C., can be contacted at [dcurtiss@aapg.org](mailto:dcurtiss@aapg.org); or by telephone at 1-202-684-8225.)



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The February 2009 cover of the AAPG Bulletin

# More science than you can shake a pick at.

## **Charging of the Neogene Penglai 19-3 Field, Bohai Bay Basin, China: Oil accumulation in a young trap in an active fault zone**

*Fang Hao, Xinhui Zhou, Yangming Zhu, Xiaohuan Bao, and Yuanyuan Yang*

Biomarker compositions and multivariate analysis of source rocks and oil samples reveal three different sources, all filling the trap from different directions. Oil charge from multiple source rock intervals and multiple generative kitchens, and focusing of oil originating from a large area of the Bozhong depression into the same trap, resulted in rapid oil accumulation in this large oilfield in a very young trap within an active fault zone.

## **Timing and petroleum sources for the Lower Cretaceous Mannville Group Oil Sands of Northern Alberta Based on 4-D Modeling**

*Debra K. Higley, Michael D. Lewan, Laura N. R. Roberts, and Mitchell Henry*

The source of the highly degraded oil and tar has been controversial, but modeling of subtle structures shows that source rocks in the Jurassic Fernie Group were the initial and major contributors, prior to generation from older source rocks.

## **Dependence of joint spacing on rock properties in carbonate strata**

*Carine Lézin, Francis Odonne, Gérard J. Massonnat and*

*Gilles Escadellias*

Two carbonates of different age and diagenetic history were studied. Joint density can be correlated with facies variation, bed thickness, mineralogy, porosity, and sparite/micrite ratio.

## **Sequence stratigraphic controls on complex reservoir architecture of highstand fluvial-dominated deltaic and lowstand valley-fill deposits in the Upper Cretaceous (Cenomanian) Woodbine Group, East Texas field: Regional and local perspectives**

*William A. Ambrose, Tucker F. Hentz, Florence Bonnafé, Robert G. Loucks, L. Frank Brown, Jr., Fred P. Wang, and Eric C. Potter*

These highstand and lowstand elongate deposits occur in the basal three fourth-order sequences of the unit, which comprises a maximum of 14 such cycles. A full assessment of reservoir compartmentalization, fluid flow, and unswept mobile oil in East Texas field should include the highstand, fluvial-dominated deltaic and lowstand valley-fill sandstone-body architecture.

## **A 3-D ground-penetrating radar and wavelet transform analysis of the morphology of shoreface deposits in the Upper Cretaceous Ferron Sandstone Member, Utah**

*Keumsuk Lee, Robert Szerbiak, George A. McMechan, and Namsoon Hwang*

Analysis of ground-penetrating radar data yields reflections that correlate well with bed tops. Quantitative information on the subseismic-scale surface geometry of these storm-dominated shoreface beds is expected to result in more refined reservoir models. In addition, the connectivity of units indicated by the scale of the morphology can be an indirect indicator of unit correlation and permeability paths.



Members may access the AAPG Bulletin online at [http://www.aapg.org/February\\_Bulletin/](http://www.aapg.org/February_Bulletin/)

Also, submit your next paper for consideration via <http://www.aapg.org/Bulletin/>

The AAPG is diligent about timely publication of the geoscience of the day.

## GEOPHYSICALcorner

## Thinking Nano Is a Big Thing

(The Geophysical Corner is a regular column in the EXPLORER, edited by Bob A. Hardage, senior research scientist at the Bureau of Economic Geology, the University of Texas at Austin.)

By BOB HARDAGE

Let's think small. Real small – because an exciting science referred to as nanotechnology is being introduced into reservoir characterization and monitoring.

The sizes of devices and sensors that can now be fabricated to react in measurable ways when they contact a specific fluid, chemical or biological agent have been reduced so that they can be injected into some hydrocarbon reservoirs and become part of the fluid flow through the reservoir system.

The term “nano” indicates the minute size of everything related to this technology. Common terminology appearing in descriptions of this new reservoir-monitoring science includes nanodevices, nanosensors and nanorobots.

\* \* \*

Physical sizes of nanodevices are shown in figure 1. The sensors range in size from that of a microelectromechanical-system (MEMS) device (as large as 100 micrometers [ $\mu\text{m}$ ]) down to a “buckyball” (1 nanometer [nm] in diameter) – a range of five orders of magnitude.

A buckyball is a spherical cage of

carbon atoms, commonly 60 atoms ( $\text{C}_{60}$ ) but sometimes more, capable of encasing a molecule or ion that can be designed to react in a predesigned way whenever it contacts a target molecule.

A buckytube, or nanotube (figure 1), is an elongated cylinder of carbon atoms having a diameter a bit more than one nm and a length ranging from one  $\mu\text{m}$  to several millimeters. A nanotube also can contain process-activated molecules.

Similar to a buckyball's behavior, the reaction of a nanotube offers a host of possibilities that may provide diagnostic information about reservoir flow and connectivity, including:

- ✓ Convert to a filament with high electrical conductivity.
- ✓ Change color.
- ✓ Start a catalytic action.
- ✓ Become chemically inactive.
- ✓ Become heat resistant.

The target molecule that initiates the desired reaction can, in theory, be tailored to be a wide range of molecules found in, or associated with, producing hydrocarbon systems.

Nanodevices, perhaps, can be made that initiate their predesigned action after set periods of calendar time to measure how far they have progressed through a reservoir – and to identify in which XYZ coordinates they reside after that time period.

\* \* \*

To put the possibility of injecting nanodevices into reservoirs into perspective, a comparison between

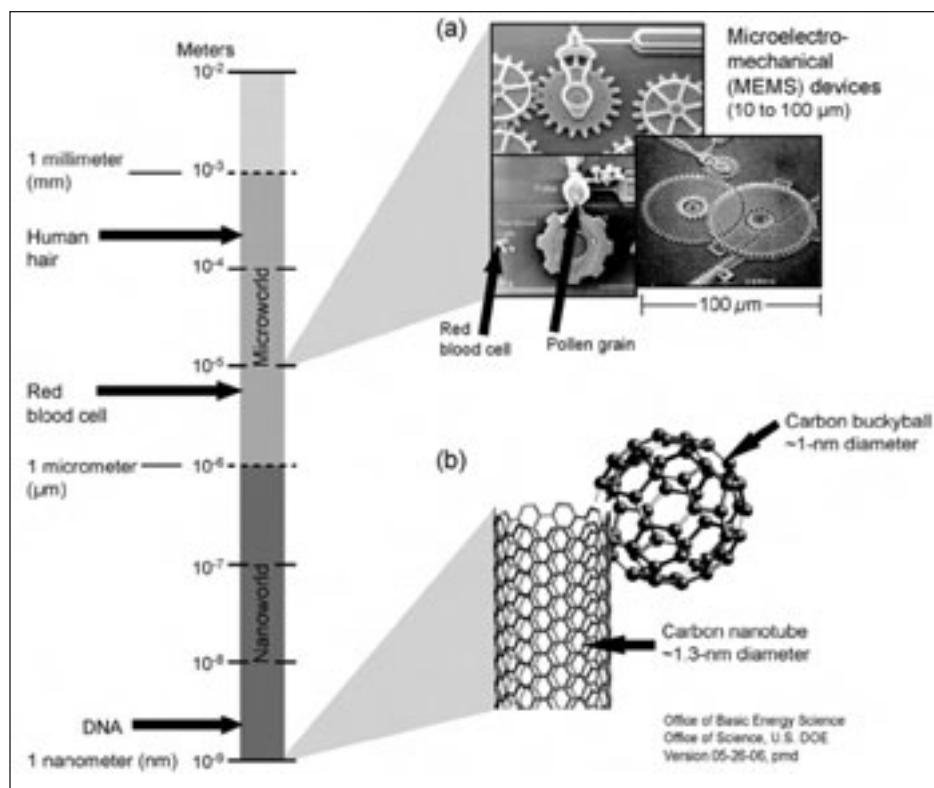


Figure 1 – Logarithmic scale on left shows size range of selected natural objects (human hair, red blood cell, DNA molecule). Objects are compared with size range of manufactured nanodevices, extending from MEMS devices (top) to buckyballs (bottom).

reservoir pore sizes and diameters of nanodevices is helpful.

One such comparison is illustrated in figure 2 (next page), to show that for some reservoirs pore space is adequate for some nanodevices to move through

the reservoir as components of natural reservoir-fluid flow.

Some reservoirs will not have pore sizes large enough to allow nanodevices

[continued on next page](#)

Attention  
Deepwater  
Explorers

### Global Turbidite Field & Reservoir Database

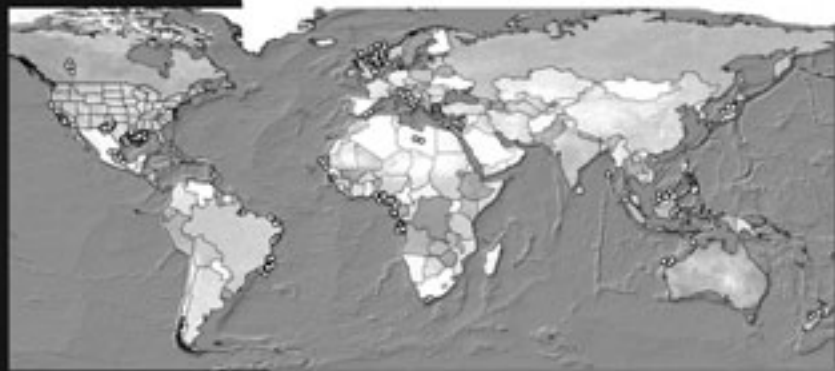
**W**hen you are exploring in deepwater clastic systems and need to do a rapid analysis of global analogs, or prepare statistical summaries for input in play analysis software, **this is the tool you need.**

Originally developed by Steve Cossey of Cossey & Associates, Inc., this fully searchable database is packed with data and user-friendly features –

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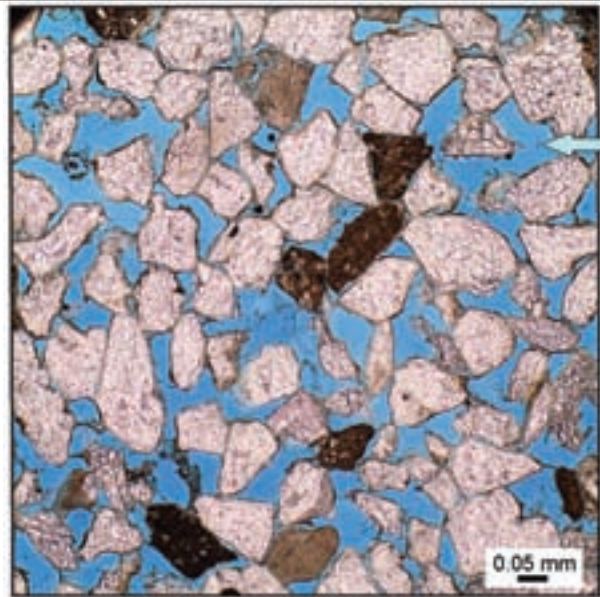
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One pore diameter (~5×10<sup>-5</sup> m) equals the width of 50,000 bucky-balls or 1 to 5 MEMS devices.

Figure 2 – Thin-section micrograph of Frio reservoir comparing pore dimensions with sizes of nanodevices. Porosity of reservoir interval ranges between 20 and 30 percent.

Frio Formation, Liberty County, Texas, 5,040 ft

Micrograph courtesy Robert G. Loucks, BEG

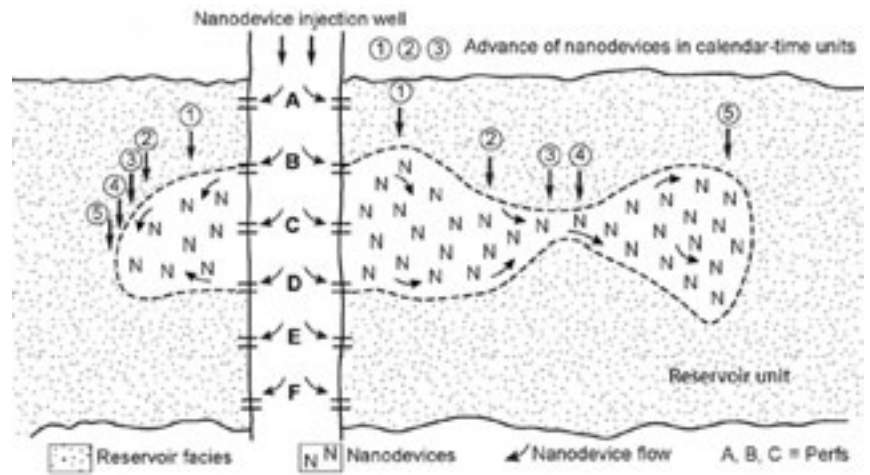


Figure 3 – One concept for use of nanotechnology in reservoir characterization. Nanodevices (N) are injected in perfs A through F and move through a reservoir. At calendar-delay times of 1, 2, 3, 4 and 5 time intervals, spatial distribution of the nanodevices is measured by EM or seismic methods to determine their XYZ coordinates, allowing inferences to be made about fluid-flow paths, compartment boundaries and reservoir connectivity.

continued from previous page

to disperse through them efficiently, contrary to the scenario shown in figure 3.

Because nanotubes can be designed to become efficient electrical conductors, electromagnetic (EM) measurements may be the branch of geophysics that first develops applications of nanotechnology in reservoir characterization.

A possible application is illustrated in figure 3.

In this hypothetical case, nanodevices are injected into a reservoir, and at predesigned time delays (arbitrarily set at 1, 2, 3, 4 and 5 arbitrary calendar-time units in this example), the positions of the injected conductive nanodevices are measured by an appropriate crosswell EM or surface-based EM procedure. The objective is to determine, in three-dimensional space, the internal flow paths that exist within a reservoir system as that reservoir is being produced.

If nanodevices can be designed to become miniature acoustic pingers, as some envision and hope, the progress of the nanodevices through a reservoir can perhaps be measured by crosswell seismic methods.

\* \* \*

All of these possible applications, and others, are being discussed and proposed by scientists who develop nanodevices and by geoscientists and engineers who wish to use the devices in reservoir characterization.

Reservoir engineers and geoscientists describe what they want to measure, and nanotechnology scientists decide whether, and how, an appropriate nanodevice can be manufactured that will generate the required data.

It will be some years before nanoscience can be put into practice in reservoir characterization. The purpose of this article is to provide a brief, layperson description of the concepts so that people who are intrigued by the possibilities can monitor development of the technology.

A group of oil companies has formed the Advanced Energy Consortium to support development of nanotechnology at the University of Texas at Austin and Rice University. This consortium has established a Web site at <http://www.beg.utexas.edu/aec/index.htm>. (See related story, page 42.)

□



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## Risk Analysis, Prospect Evaluation &amp; Expl. Economics

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Aberdeen, Scotland	April 20 - 24
Calgary, Alberta	April 27 – May 1
Denver, Colorado*	August 17 - 21
Calgary, Alberta	September 28 – October 2
Houston, Texas	October 19 – 23
Bali, Indonesia	October 19 – 23

## An Overview of Exploration Play Analysis

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## WWWupdate

Datapages Breaks  
Million-Hit Mark

By RON HART  
AAPG/Datapages Manager  
AAPG Datapages had an exceptional year in 2008, setting several new records in the process. Web use by AAPG members – and by the upstream community at large – posted an all-time high.

Two of AAPG Datapages' properties hosted more than one million unique visitors during 2008.

"Both *Search and Discovery* and our Archives Database programs

experienced more than one million unique visits in 2008," said Jim Blankenship, AAPG geosciences director and the staff director who oversees the Datapages program.

"We've seen *Search and Discovery* use doubling each year for the past several years and we believed we were going to pass the one million mark in 2008 – but passing the one million mark in our Archives database program was a surprise to us this year," he added.

A unique visitor is how we measure success.

A "unique visit" is defined as a user who comes to a Web site with a purpose. Notwithstanding, he can access one document or 20 during his visit.

Web publishers used to count the number of files served, or the number of clicks on a Web site. A unique visit, however, is a chance to satisfy a customer and it is a chance to help a person or sell more product to him.

Why is this important to AAPG?

Everybody wants to know the community is using their work.

An author wants to believe that publishing with AAPG is a way to be recognized for his work and his time is not wasted writing a research paper. A million customer visits offers an author a million reasons to publish with AAPG.

AAPG Datapages' archives database is accessed by several user groups, including the members of AAPG. Their collective usage comprises the one million visits. Geologists come at the database through a 12-month subscription (company or university), through AAPG Members Only Bulletin Archives search, through the monthly BULLETIN Online Subscription program and through our transactional (Pay-Per-View) Web site.

What's different this year? Why did the number grow unexpectedly?

In a word: Google.

This year we have been working with Google Scholar to optimize the user's search experience with our data.

Our user statistics indicate a large body of geologists (members and non-members), geo-techs, students and anyone interested in technical information about oil and gas E&P are availing themselves of the data.

## Incredible!

Blankenship pointed out another aspect of this good news for AAPG.

"This increased activity also has driven our Pay-Per-View activity," he said.

"A lot of people try Pay-Per-View for a few times before subscribing to a regular 12-month enrollment," Blankenship noted. "We have seen a three-fold increase in our pay-per-view sales, and we have introduced some improvements and format choices for the users.

"I am convinced the pay-per-view option will be used by more and more people over time, as folks get used to the online resource," he added. □

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Watch for the Technical Program & Registration Announcement in the March issue of EXPLORER.

The excitement is building. Make plans to head West!



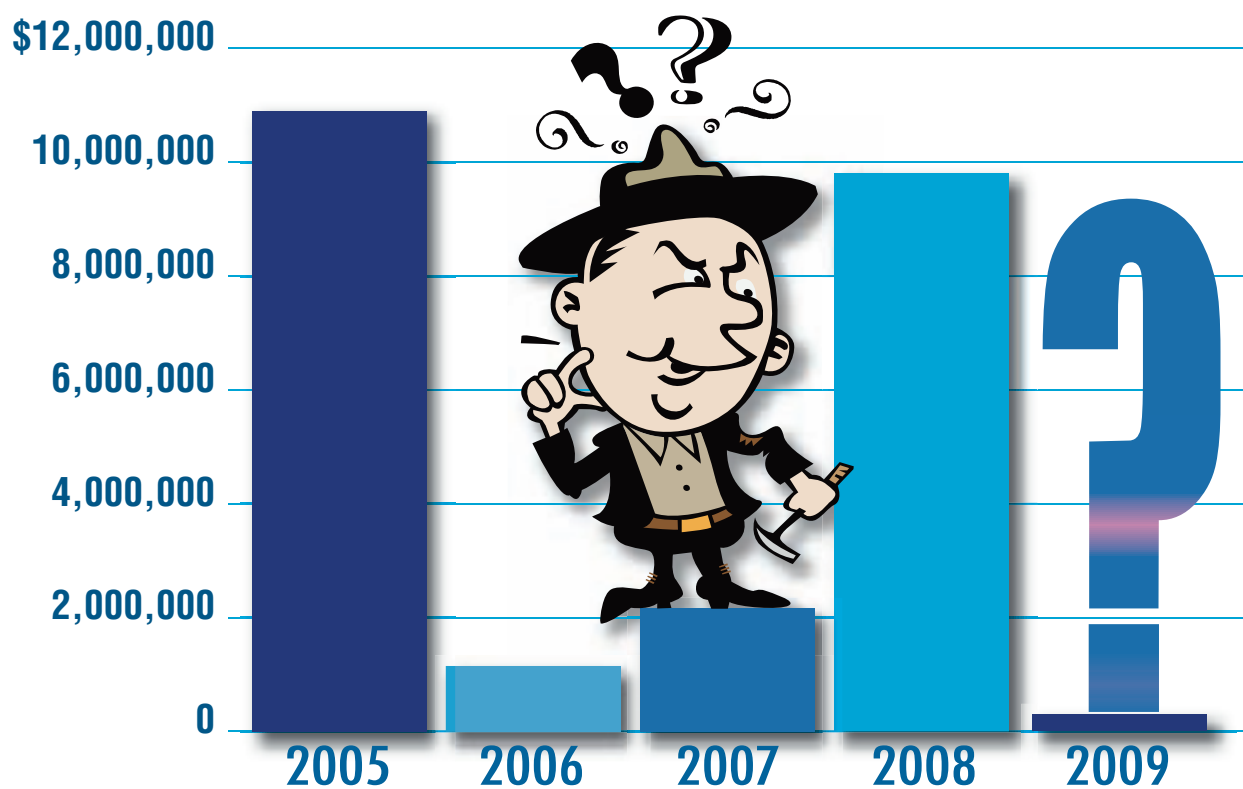
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*Meeting Challenges*  
ASSURING SUCCESS

# Eliminate the Question Mark

Together we can make **2009** the best year yet while moving closer to our **\$35 million** goal. Help support any of the campaign endowment opportunities to ensure the future success of the AAPG Foundation.



### The Power of Education

The Foundation has a long history of supporting educational opportunities and spreading knowledge around the globe.

### Recognition of Educators

The Foundation continues to recognize educators for their contributions to science and humanity.

### Knowledge Preservation

The Foundation supports AAPG as a leader in locating, preserving and redistributing data, especially in digital format.

### Support for Undergraduate and Graduate Students

The Foundation's Grants-in-Aid Program provides support for graduate students' research throughout the world. Financial encouragement will be required to attract the best and brightest undergraduate and graduate students.

### Dissemination of Information

A major interest to the Foundation is the dissemination of geological information, through publications, educational courses and conferences.

### Public Outreach

The Foundation is in a position to provide information to the public about the geoscience profession and the importance of the energy industry. Outreach is a key component, especially in the area of K-12 Education

### Emerging Opportunities

The AAPG Foundation will support exciting new project needs that are continually being revealed in the geoscience community.



For program details or to provide your support for the "Meeting Challenges...Assuring Success" campaign contact Rebecca Griffin, Foundation Manager at [rgriffin@aapg.org](mailto:rgriffin@aapg.org), or phone 918.560.2644; or Alison Robbins, Corporate Relations Development Coordinator at [arobbins@aapg.org](mailto:arobbins@aapg.org), or phone 918.560.2674.

## FOUNDATION Update

By REBECCA GRIFFIN  
AAPG Foundation Manager

Approvals of funding and the establishment of a new award that honors a longtime supporter of geosciences and the Association have been announced by the AAPG Foundation's Board of Trustees, which met recently in Tulsa.

Foundation Chairman William Fisher announced that the trustees:

- ✓ Approved \$50,000 funding in support of K-12 Education through the "Bookout Initiative" at Ellison Miles Geotechnology Institute. (Made possible through a donation by John Bookout.)
- ✓ Approved \$50,000 funding for the Institute for the Study of Earth and Man at Southern Methodist University, designated to the Roy M. Huffington Department of Geological Sciences. (Made possible

through a donation from Leighton Steward and EPG Resources.)

✓ Approved \$25,000 funding to support the AGI Foundation's program, "Bridging the Gap Between High School and College."

✓ Approved \$9,000 funding to support expenses related to the participation in the 2010 Boy Scout Association National Jamboree, which will be under the direction of Ron Hart, AAPG Datapages manager.

✓ Established the John W. Shelton Search and Discovery Award to honor John W. Shelton, the originator and leader of AAPG's Internet publication program (See related story, page 33).

The \$500 cash award will be funded through an endowment established in the Foundation Awards Fund and will be

given annually to the author of the best contribution to AAPG's e-journal *Search and Discovery* during the past year.

\* \* \*

In other Foundation news:

✓ A new Foundation Web site has been launched that features downloadable pdf files of the Investment Policy, Annual Report and Grant Proposal Guidelines.

Its address is  
<http://foundation.aapg.org>.

✓ Two international universities, the University of Central Venezuela and the Universidad Industrial de Santander (Colombia), have provided funding to the

AAPG Foundation for Digital Products University Endowment Subscriptions to benefit their respective university.

In addition, Trustee Associates Fred Tietz and Scott Tinker have jointly established a digital products subscription designated for the University of Colorado in honor of David Budd, John Chronic, Warren Thompson, Ted Walker and Paul Weimer.

These three universities will be provided access to AAPG's digital library in perpetuity through the Foundation's endowment program, providing over 600,000 pages of national, international and regional libraries of petroleum, geology and geophysics information.

For program details, contact Rebecca Griffin in the Foundation office, at 918-560-2644.

### Foundation (General)

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Kaspar Arbenz	<i>John Chronic, Warren</i>
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	<i>and Paul Weimer</i>
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	<b>Named Grant</b>
	Donald A. O'Nesky
	<i>In honor of AAPG and</i>
	<i>AAPG Foundation</i>
	<i>employees, and in</i>
	<i>memory of Fred A. Dix</i>
	<b>James E. Wilson</b>
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	<b>Student Fund</b>
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	<i>In memory of Francis J.</i>
	<i>Pettijohn</i>
	<b>University of Central</b>
	<b>Venezuela</b>
	University of Central
	Venezuela
	<b>Special Publications Fund</b>
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## The Polar Petroleum Potential Conference & Exhibition

### REGIONAL SESSIONS

- Northern Canada — Mainland, Beaufort Sea, Arctic Islands
- Alaska North Slope, Beaufort Sea, Chukchi Sea
- North Atlantic Conjugate Margins
- Baffin Bay — Labrador Sea
- Norwegian Barents Sea
- Laptev Sea, East Siberian Sea, Russian Chukchi Sea
- Kara-Yamal Region
- Russian Barents Sea and Timan Pechora

### PAN ARCTIC SESSIONS

- Arctic Petroleum Systems, Plays and Assessments
- Tectonic Evolution of the Arctic: Late Proterozoic-Paleozoic
- Tectonic Evolution of the Arctic: Mesozoic-Cenozoic
- Central Arctic Tectonics and Petroleum Potential
- Arctic Unconventional Resources

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**More science than you can shake a pick at.**

# Spring Student Expo Set March 12-14

By MIKE MLYNEK  
Assistant Manager Membership  
Student Focus

AAPG's rapidly expanding Student Expo program is off to a fast start this year that aims to repeat last year's successes.

First up: The annual AAPG/SEG Spring Break Student Expo, set March 12-14 at the University of Oklahoma in Norman, Okla.

Now is the time for students and companies to register for the event, designed to provide a setting for industry representatives and students to meet.

As in past years, the Expo will include a poster competition, short courses, field trips (including a rig tour), SEG's "Challenge Bowl," a golf tournament and

plenty of chances for networking.

Last year's event had 33 companies interviewing 213 students from 52 different universities.

The registration deadline for this year's Expo is March 6. Online registration and additional information is available at <http://geology.ou.edu>.

\* \* \*

Last year's Expo success stories include:

✓ The fall AAPG/SEG Student Expo, held Oct. 8-9 at the George R. Brown Convention Center in Houston, attracted 359 students from 102 different universities and representatives from 36 companies.

The 2009 fall Expo will be held at the same location, on Sept. 21-22. For additional information go to <http://www.studentexpo.info>. Registration will open late summer.

✓ The seventh annual Rocky Mountain Rendezvous-Laramie was held Sept. 19-22 on the University of Wyoming campus, attracting more than 120 students and 23 companies.

The poster awards, sponsored by Chevron, went to Weiguo Li (first place), Jonathan Allen (second) and Clay Painter (third).

Dates for the 2009 Rocky Mountain Rendezvous will be announced this spring. For information, go to <http://aapg.gg.uwyo.edu/RockyMtnRendezvous/home.html>, or contact

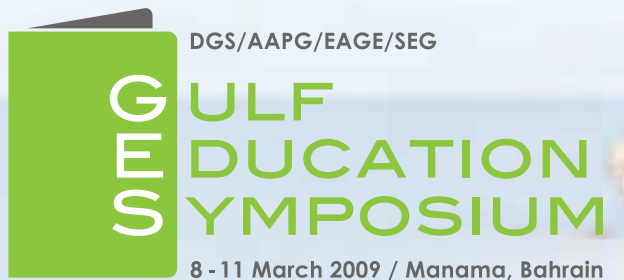
Randi Martinsen at [randmart@uwyo.edu](mailto:randmart@uwyo.edu).

✓ The Student Job Quest, held Oct. 11-12 in Pittsburgh in conjunction with the Eastern Section meeting, attracted about 50 students.

This year's event will be held with the Eastern Section's meeting in Evansville, Ind., on Sept. 20-22.

✓ The first annual AAPG-SEG West Coast Student Expo, held Sept. 25-27 at California State University, Northridge, attracted 77 students from 18 universities (and four states) and representatives from nine companies.

This year's event will be held Oct. 1-3. For information go to <http://www.csun.edu/geology/aapg-seg.htm>. □



## Scheduled courses:

- Petroleum Resources and Reserves: An Overview of Recommended Geological Practices - *Dan Tearpock*
- 4D Seismic - *Ian Jack*
- Application and Interpretation of Converted Waves - *Robert R. Stewart & James E. Gaiser*
- Uncertainty in Reservoir Management - *Peter King*
- Applied Subsurface Geological Mapping - *Dan Tearpock*
- Applications of Geophysical Inversion and Imaging - *Larry Lines & Brian Russell*
- The Use of Surface Waves for Near Surface Velocity Model Building - *Laura Valentina Socco*

**Register now!**  
[www.eage.org/ges](http://www.eage.org/ges)

## AEC Gives Nano Research Awards

More than \$6 million in funding nanotechnology research has been awarded by the Advanced Energy Consortium in Austin, Texas.

AEC is a joint research consortium managed by a team of industry experts, with the Bureau of Economic Geology in Austin serving as the managing organization. AAPG President Scott Tinker serves as AEC's director.

The consortium's goal is to develop subsurface nanosensors that can be injected into oil and gas well bores to help provide more efficient exploitation of hydrocarbon resources.

AEC's first awards culminate a five-month technical evaluation of proposals from around the world. The 19 winners of funding are:

- ✓ Texas: The University of Texas at Austin and Rice University.
  - ✓ Massachusetts: Boston University, Harvard University, Massachusetts Institute of Technology, Tufts University and Northeastern University.
  - ✓ California: University of California-San Diego, University of California-Berkeley, California Institute of Technology.
  - ✓ Georgia Institute of Technology.
  - ✓ Pennsylvania State University.
  - ✓ Louisiana State University.
  - ✓ University of Oklahoma.
  - ✓ Northwestern University.
  - ✓ University of Michigan.
  - ✓ University of Calgary (Canada).
  - ✓ Kyoto University (Japan).
  - ✓ The Alberta (Canada) Research Council.
- AEC intends to fund specific research projects at these institutions for periods ranging from one to three years. □

## InMemory

- Paul Henry Carter Jr., 75  
Houston, Nov. 11, 2008
- William J. Gregg, 60  
Houghton, Mich., Dec. 6, 2008
- James J. Halbouty, 96  
Houston, Dec. 13, 2008
- Ferdinand G. Larmine, 79  
Tring, England, Oct. 16, 2008
- Lawrence R. Lysinger, 80  
Broomfield, Colo., Oct. 18, 2008
- Charles W. Smith, 87  
Oklahoma City, Dec. 15, 2008
- Gail F. Vernon Jr., 63  
Edmond, Okla., Sept. 30, 2008
- Ben L. Wicker Jr., 66  
Richmond, Texas, Dec. 6, 2008
- Donald R. Young, 60  
Houston, Nov. 28, 2008

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

## MEMBERSHIP & certification

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

Any information bearing on the qualifications of these candidates should be sent promptly to the Executive Committee, P.O. Box 979, Tulsa, Okla. 74101.

Information included here comes from the AAPG membership department.

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

Membership applications are available at [www.aapg.org](http://www.aapg.org), or by contacting headquarters in Tulsa.

### Nigeria

Adeyemi, Adebayo Solomon, Mobil Producing Nigeria, Lagos (D.R. Cook, T.S.A. Akewusola, O.O. Adeniyi); Afe, Mayowa Lawrence, Danvic Concepts International Nigeria, Lagos (A.A. Adesida, A.O. Akinpelu, F.O. Fatona); Arowolo, Isaac Olusola, Chevron Nigeria, Lagos (K.A. Fabiyi, O. Bakare, A.O. Ekun); Ogr, George, Nigerian National Petroleum Company, Lagos (K.A. Koleoso, E.G. Odior, A.O. Akinpelu); Ogunjemiyo, Esan Mascot, NNPC-NAPIMS, Lagos (K.A. Koleoso, E.G. Odior, A.O. Akinpelu); Okoro, Chimadbi Paul, NNPC-NAPIMS, Lagos (E.G. Odior, K.A. Kanu, B. Olaleye)

### Republic of Singapore

Worthington, Paul F., Gaffney, Cline & Associates, Singapore (A.K. Clarijs, I.D. Dunderdale, C.A. Rachwal)

### Saudi Arabia

Li, Jing, Saudi Aramco, Dhahran (C.J. Heine, H. Xiao, S. Wu); Yu, Haichao George, Saudi Aramco, Dhahran (C.J. Heine, S. Wu, H. Xiao)

### Wales

Della Porta, Giovanna, Cardiff University, Cardiff (V.P. Wright, P.M. Harris, J.A. Kenter) □

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### For Active Membership

#### Alaska

Silliphant, Laura JoAnn, State of Alaska, DNR, Anchorage (J.A. Houle, D.P. Shellenbaum, P.L. Decker)

#### Oklahoma

Ziga, Jeffrey M., Chesapeake Energy, Oklahoma City (J.C. Peterson, M.T. Singleton, S.A. Callantine)

#### Texas

Anderwald, Russell Scott, Baker Hughes Inteq, Houston (F.P. Hearn, C.M. Young, T.L. Wright); Dooley, Tim Paul, University of Texas at Austin, Austin (S.W. Tinker, M.P.A. Jackson, K.R. McClay); Gibbins, Stacie L., ExxonMobil, Houston (M.T. Weaver, N. Rigg, D.M. Advocate); Pritchett, John, Woodside Energy, Houston (W. Lefler, P. Dowling, C. Van Brummen)

#### Australia

Robertson, Stephen Kenneth, Santos, Adelaide (A.A. Adesida, W.C. Riese, N. Schneidermann)

#### Bahrain

Qassim, Naji Ahmed, Bahrain Petroleum, Awali (I.A. Al-Ghamdi, R.S. Iyer, J.E. Scott)

#### Canada

Crutchfield, Benjamin John, Mancal Energy, Calgary (R.J. Langill, M.P. Inglis, G.E. Reinson)

#### Egypt

Abdel Fattah, Mohsen Ahmed, Halliburton, Cairo (J.P. Elliott, D.V. Chitale, M.H. Metwalli)

#### England

Whaley, Jane, self-employed consultant, Gloucestershire (G.A. Hayman, M.J. Lakin, J. Hume)

#### France

Bennaceur, Kamel, Schlumberger, Paris (R. Plumb, M. Verliac, S.W. Tinker); Coulon, Michel, TOTAL, Pau (G.M. Gillis, N. Schneidermann, J.R. Hogg)

#### Germany

Hellwig, Dirk, W.L. Gore & Associates GmbH, Munich (P.A. Harrington, A.H. Silliman, A. Brown)

#### Mexico

Salazar Velasquez, Julian, Monclova Pirineos Gas, Nuevo Leon (R.J. Kerian, K.J. Ferdinand, L.G. Rivera)

## Certification

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

### Petroleum Geologist

#### Ohio

Raabe, Bruce A., consultant, Cincinnati (reinstatement)

#### Texas

Coryell, Dana K.D., Netherland, Sewell & Associates, Dallas (reinstatement)

### Petroleum Geophysicist

#### South Carolina

Wyatt, Douglas Everett Jr., URS, Aiken (G.R. Baum, R.L. Dodge, T.J. Temples)

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- ▶ Lunch
- ▶ Prospect Forum
- ▶ Finance Forum
- ▶ Sponsored Reception

### Day Two: 4 March 2009

- ▶ Theme: Unconventionals Session
- ▶ Prospect Forum
- ▶ Lunch
- ▶ Prospect Forum
- ▶ Regional: Far East Session
- ▶ Sponsored Reception

### Day Three: 5 March 2009

- ▶ Theme: Global Carbonate Potential
- ▶ Regional: Africa/Middle East Session
- ▶ Lunch
- ▶ Exhibition Closes
- ▶ Farm-Out Seminar
- ▶ Asset Valuation Seminar
- ▶ Conference Closes

[www.APPEXLondon.com](http://www.APPEXLondon.com)

## READERS' forum

**'Is It Reversible?'**

Regarding the Scott Tinker's "President's Column" (January EXPLORER): Thanks for your monthly column on climate change.

It would be more convenient to write about what a great group of people we are in the AAPG rather than to take on a substantive topic like this. I would not have been as judicious with this subject as Scott was, but I will never be president of the AAPG for that reason!

My favorite question on climate change (and many other topics in science) is, "Is it reversible?"

Many people innocently assume that everything is reversible. The outcome of our conversations would have a completely different emphasis if we started by asking this question.

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

Years ago I attended a lecture by Deepak Chopra at the University of Houston in which he made an astonishingly clear observation. He said that our civilization is based on the assumption that matter is primary and that consciousness is secondary. This is a valid assumption, but its inverse is equally valid – and imagine how different everything would be if matter were secondary and consciousness were primary!

I cite a recent article by Bjord Lomborg on climate change ... because

he is perfectly analytical and only considers the balance of the equation. In this case, he writes that if the world did everything possible to reduce the human effects of climate change, the net difference would be less than 1 degree Fahrenheit in 100 years.

That is the overwhelming "bottom line" to the entire debate.

Tinker is a different AAPG president because he places science and critical thinking first.

Arthur E. Berman  
Sugar Land, Texas

**Sympathy**

I fully sympathize with journalists who sometimes don't quite get the science right – after all, they're operating outside of their expertise.

But surely grammar must fall within the area of journalistic expertise – and the headline on page 34 of the January EXPLORER is really a doozy! (Hey, Who Overturned This Strata?) "Strata" is plural, referring to two or more layers or beds of rock. Stratum is singular, referring to a single layer or bed. So your headline should either refer to "these strata" (preferred) or "this stratum" (not so good, given that many layers are overturned).

The EXPLORER staff should really be red-faced! Is anyone proof-reading? After all, it IS a geological publication!

Peter R. Rose  
Austin, Texas

**Letter Perfect**

Does the term Mcf (or mcf) mean million cubic feet or thousand cubic feet? Does Mbo mean million barrels of oil or thousand barrels of oil? Does Mb/d mean million barrels per day or thousand barrels per day?

The dual use of the letter "M" to mean one thousand and also to mean one million is causing confusion and arithmetic errors in AAPG publications. I have noted numerous arithmetic errors in recent months involving the Roman numeral "M" or "m" in articles in the AAPG BULLETIN and the AAPG EXPLORER.

The solution to this problem is obvious. The letter "k" is used worldwide in all sciences to mean one thousand, and the letter "M" to mean mega or million. The launching of a new abbreviation, "kcf," to mean thousand cubic feet should prove to be easy and readily acceptable.

A recent example of consistent use of "M" to mean million and "k" to mean thousand (although "K" was used instead of "k") was an article by Christof Ruehl, chief economist of BP, in the fourth-quarter 2008 issue of the IAEE Energy Forum ("High Prices for How Long? The 2008 BP Statistical Review of World Energy"). Two examples from Christof Ruehl's article are:

✓ "In contrast to oil demand, global crude oil production last year fell by 130 Kb/d to 81.5 Mb/d. OPEC output fell by 360 Kb/d in aggregate, because ..."

✓ "Meanwhile, global refining capacity is being added about twice as fast as earlier this decade. Capacity additions in 2007 totaled 1.2 Mb/d and exceeded crude run growth by more than 400 Kb/d."

I believe it is time to eliminate the usage of "M" or "m" to mean thousand in AAPG publications.

✓ Let M = 1,000,000 (and change m.y. to M.y.).

✓ Let k = 1,000 (therefore, kcf = thousand cubic feet)

C.A. Norman  
Houston

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### 2009 NAPE Set for February 5-6

Another record-breaking crowd is expected to attend the 2009 NAPE Expo to be held Feb. 5-6 at the George R. Brown Convention Center in Houston. Last year's event drew over 15,700 persons with 995 companies exhibiting international prospects for the upstream petroleum professionals.

For details and a digital brochure access the 2009 NAPE Web site at <http://www.napeonline.com>. □



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### SHORT COURSES

#### Essentials of Subsurface Mapping

April 30 - May 1, 2009 / Houston, TX

Instructor: Richard Banks, Scientific Computing Applications, Inc., Tulsa, OK

<http://www.aapg.org/education/shortcourse/details.cfm?ID=29>



#### Reservoir Engineering for Petroleum Geologists

May 19-20, 2009 / Austin, TX

Instructor: Richard G. Green, Saxon Oil, Dallas, TX

<http://www.aapg.org/education/shortcourse/details.cfm?ID=71>



#### Deep-Water Salt Tectonics

May 20-21, 2009 / Austin, TX

Instructor: Martin P. A. Jackson, The University of Texas at Austin

<http://www.aapg.org/education/shortcourse/details.cfm?ID=8>



### FIELD SEMINARS

#### Deep-Water Siliciclastic Reservoirs, California

April 27-May 2, 2009 / Begins in Palo Alto and ends at the airport in San Francisco, CA

Leaders: Stephan Graham and Donald R. Lowe, Stanford University, Stanford, CA

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=17>



#### Controls On Porosity Types and Distribution in Carbonate Reservoirs

May 17-22, 2009 / Almeria Region, SE Spain, begins and ends in Las Negras, Spain. Fly from London/Barcelona/Madrid

Leaders: Evan K. Franseen, University of Kansas, Lawrence, KS; Robert H. Goldstein, University of Kansas, Lawrence, KS;

Mateu Esteban, Consultant, REPSOL-YPF, Mallorca, Spain

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=2>



#### Complex Carbonate Reservoirs: The Role of Fracturing, Facies and Tectonics

May 24-30, 2009 / Begins in Naples and ends at Rome International Airport, Italy

Leaders: Raffaele Di Cuià, G.E. Plan Consulting, Ferrara, Italy; Davide Casabianca, Marathon Oil International, Aberdeen, UK;

Claudio Turrini, Consultant, Paris, France

<http://www.aapg.org/education/fieldseminars/details.cfm?ID=79>



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American Association of Petroleum Geologists

## Volatility, globalization driving market

## Coal at Center of Power Shift

By JEREMY PLATT  
and WILLIAM A. AMBROSE

Coal occupies an unenviable position in the fossil fuel hierarchy.

With its use concentrated in large power stations in most countries, it is a prime candidate for carbon capture and storage, even though technologies for this are not yet commercial – they face enormous cost hurdles and use vast amounts of energy in such steps as concentrating oxygen prior to combustion and separating CO<sub>2</sub>, not to mention a host of geo-engineering and institutional issues associated with sequestration.

Technology development now requires large-scale demonstrations – a critical stage on the path to commercial development – and further innovations are sought.

This places carbon capture and storage on a timeline where the technology response in the best of worlds may lag society's desire to curb emissions.

\* \* \*

Opposition to coal (along with extraordinary escalation of capital costs) came to a peak in 2007, stalling or derailing some 50 gigawatts (GW) of once-proposed plants in the United States.

At present, about 50 plants totaling 30 GW are either under construction (50 percent of the total) or in early stages of development, and thus not assured of completion in the 2008-16 period. This compares to about 70 GW of gas-fired plants (80 percent combined cycles and 20 percent combustion turbines) and 40 GW of wind capacity.

Notably, the lead in new generation has now been taken up by natural gas and renewables. In fact, natural gas is experiencing a development boom, albeit smaller than the 2000-04 merchant plant boom (see figure 1). A turn to gas at the expense of coal will intensify after enactment of

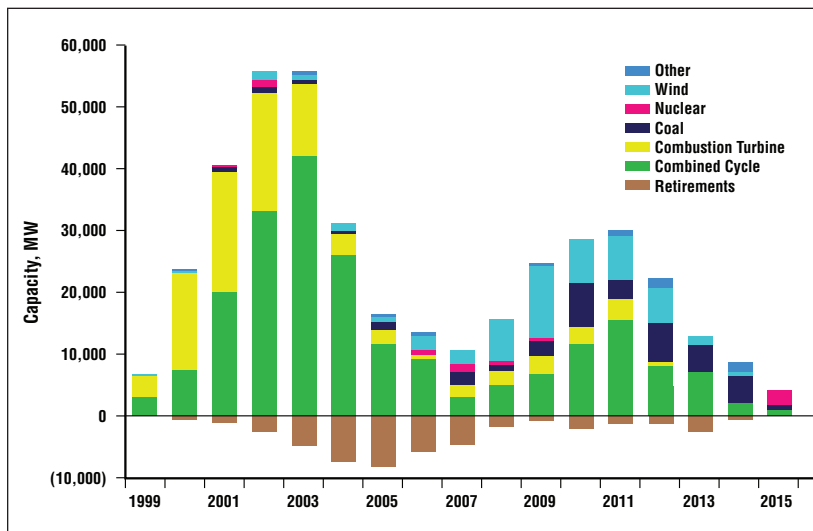


Figure 1

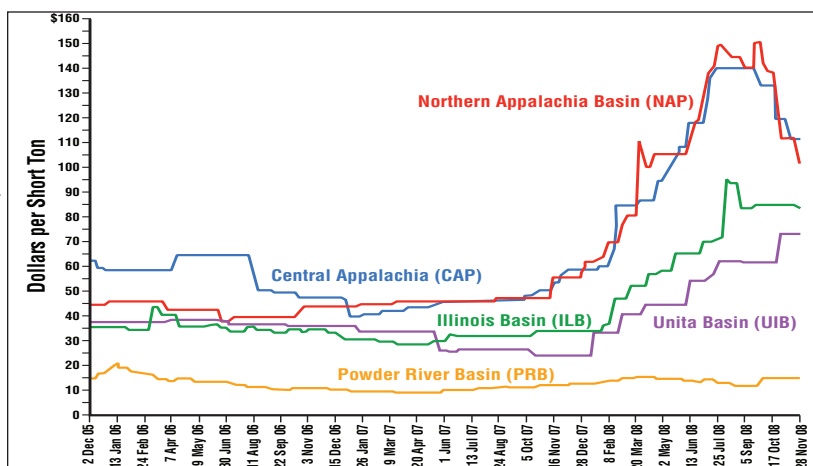


Figure 2



legislation to curb greenhouse gases.

Analysts have reached remarkably different conclusions about how much natural gas can replace existing coal-fired generation (a range from 0 to 284 GW of natural gas capacity additions by 2030 in response to stringent, early cutbacks in CO<sub>2</sub> emissions), but all conclude that obstacles to nuclear capacity, delays in mastering carbon capture and sequestration – or achievement of only moderate levels of renewables – would translate into greater natural gas use.

Early indications are that gas impacts would be far from uniform, with demand surging regionally, perhaps first in the Southeast.

So much for the long run. In the short run, natural gas-fired generation is viewed as the likely “default” choice, and this was before the financial crisis turned lenders against both capital cost and technology risk.

The implications for both coal and natural gas markets are considerable – arresting coal demand growth (unless associated with carbon capture and storage) and establishing new gas demands of about 0.5 trillion cubic feet per year

See EMD, page 50

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**PROFESSIONAL news briefs**

**Brian C. Ball**, to exploration manager, David H. Arrington Oil and Gas, Midland, Texas. Previously senior exploration geologist, David H. Arrington Oil and Gas, Midland, Texas.

**Paul M. Basinski**, to senior geologic fellow, global unconventional resource play new ventures, ConocoPhillips, Houston. Previously geologic fellow, L48 E&BD unconventional resources new ventures, ConocoPhillips, Houston.

**Mike Deming**, to senior geoscientist-Asia Pacific region, Challenger Minerals Inc., Houston. Previously senior geologist, Swift Energy, Houston.

**Marc Deshowitz** has retired as senior staff geologist from Shell Oil in Houston after 29 years. Deshowitz is now a geological consultant in Ivins, Utah.

**G. King Munson Jr.**, to vice president-exploration and development, Prize Petroleum, Lafayette, La. Previously senior geoscientist, DOR Engineering, Lafayette, La.

**Gregory A. Olson**, to senior geological adviser, Noble Energy, Houston. Previously geological adviser, Hess Corp, Houston.

**Ken Potma**, to senior geoscience adviser-exploration, Imperial Oil, Calgary, Canada. Previously head of development geoscience, RasGas Petroleum Engineering, Doha, Qatar.

**Gary Prost**, to team lead-Arctic appraisal and development,

ConocoPhillips, Calgary, Canada. Previously team lead-Arctic exploration, ConocoPhillips, Calgary, Canada.

**S. Frank Rabbio**, to exploration manager, Catamount Exploration, Denver. Previously senior geologist-Gulf Coast exploration, Cimarex Energy, Denver.

**Eugene A. Shinn** has won the 2009 SEPM William H. Twenhofel Medal, the society's highest honor, and will be honored at the June meeting in Denver. Shinn, retired carbonate geologist from the U.S. Geological Survey, is a courtesy professor at the University of Southern Florida Integrated Science Center, St. Petersburg, Fla.

**Ken Whetstone**, to vice president-exploration and development, Ironwood Oil and Gas, Houston. Previously manager-exploration and exploitation, central United States, El Paso, Production, Houston.

**Edith Newton Wilson**, to CEO and exploration manager, TallGrass Energy, Tulsa. Previously research associate, University of Tulsa.

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

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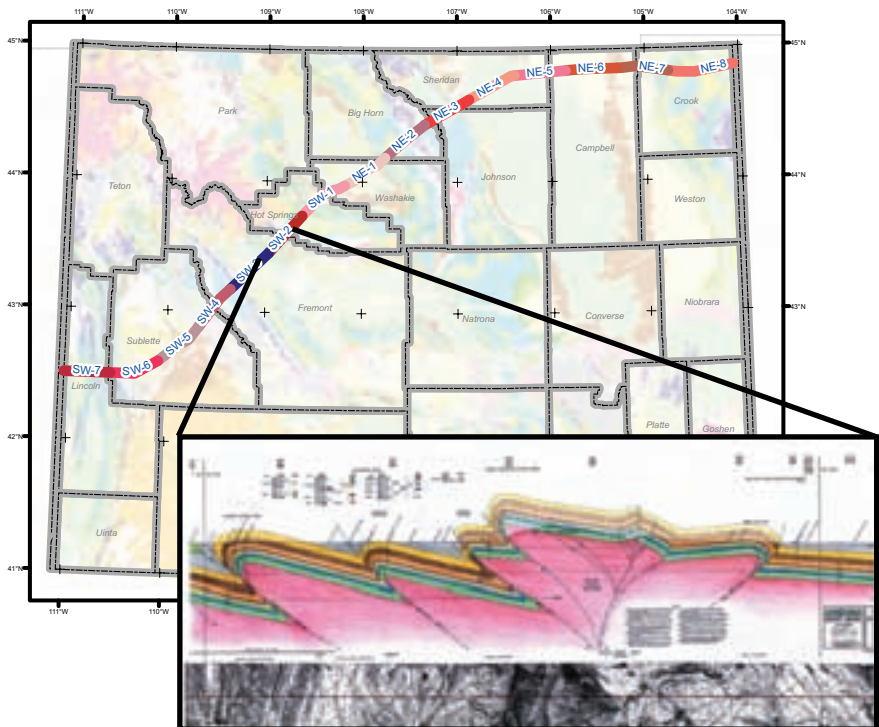
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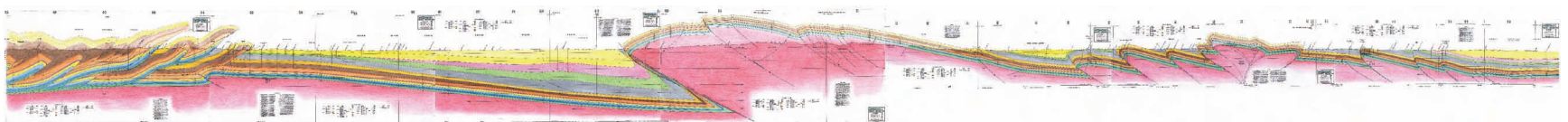
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## UPCOMING REGIONAL WORKSHOPS

2/9-10 **Texas/SE New Mexico:** US Gulf Region Mudstones as Unconventional Shale Gas/Oil Reservoirs - Houston, TX. Contact: 512-471-0320

2/12 **Eastern:** AGS/PTTC Advanced Logging School - Morgantown, WV. Contact: 304-293-2867 x5443

2/16 **Rocky Mountain:** Hydraulic Fracturing; Measurement, Characterization and Analysis - Golden, CO. Contact: 303-273-3107

2/18 **West Coast:** 2D/3D Mapping - Long Beach, CA. Contact: 661-635-0557

2/19 **West Coast:** 2D/3D Mapping - Bakersfield, CA. Contact: 661-635-0557

2/23 **Rocky Mountain:** Source Rocks 101; What the Geologist, Geophysicist and Production Engineer Should Know - Golden, CO. Contact: 303-273-3107

2/26 **Midcontinent:** Pumpers' Workshop - Russell, KS. Contact: 785-864-7396

2/TBD **Texas/SE New Mexico:** How To Start/Fix/Manage a Small Waterflood - Farmers Branch, TX. Contact: 512-471-0320

3/26 **Eastern:** Michigan Field Experiences - Mt. Pleasant, MI. Contact: 304-293-2867 x5443

For further information, view PTTC's online calendar at [www.pttc.org/national\\_calendar.htm](http://www.pttc.org/national_calendar.htm)

## MEETINGS of note

### 2009 U.S. Meetings

Feb. 5-6, (North American Prospect Expo), AAPL, annual event, Houston.

April 26-29, AAPG Southwest Section, annual meeting, Midland, Texas.

April 27-30, Society of Independent Earth Scientists, annual meeting, Hilton Head Island, S.C.

May 2-7, AAPG Pacific Section, annual meeting, Ventura, Calif.

May 4-7, Offshore Technology Conference, annual event, Houston.

June 7-10, AAPG Annual Convention and Exhibition, Denver.

\* June 17-20, American Association of Petroleum Landmen, annual meeting, Clearwater Beach, Fla.

\* June 21-24, Society of Professional Well Log Analysts, annual meeting, The Woodlands, Texas.

Aug. 27-28, Summer NAPE (North American Prospect Expo), AAPL, annual event, Houston.

Sept. 20-22, AAPG Eastern Section, annual meeting, Evansville, Ind.

Sept. 21-26, Association of Environmental and Engineering Geologists, annual meeting, Lake Tahoe, Calif.

Sept. 27-29, Gulf Coast Association of Geological Societies, AAPG, annual meeting, Shreveport, La.

Oct. 4-7, Society of Petroleum Engineers, annual meeting, New Orleans.

Oct. 7-11, AAPG Foundation Trustee Associates, annual meeting, Ponte Verde Beach, Fla.

Oct. 10-14, AAPG Mid-Continent Section, annual meeting, Tulsa.

Oct. 18-21, Geological Society of America, annual meeting, Portland, Ore.

Oct. 25-30, Society of Exploration Geophysicists, annual meeting, Houston.

### 2009 International Meetings

March 3-5, AAPG Prospect & Property Expo-London, annual event, London, England.

May 4-8, Canadian Society of Petroleum Geologists, Canadian Society of Exploration Geoscientists and Canadian Well Logging Society, annual meeting, Calgary, Canada.

May 24-27, Geological Association of Canada/Mineralogical Association of Canada, annual meeting, Toronto, Canada.

June 8-11, European Association of Geoscientists and Engineers, annual meeting, Amsterdam, Netherlands.

Nov. 15-18, AAPG International Conference and Exhibition, annual meeting, Rio de Janeiro, Brazil.

(\* Denotes new or changed listing.)

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Appointments include both faculty and research scientists. However, we are particularly interested in those seeking research scientist positions in either the Bureau of Economic Geology or the Institute for Geophysics. For more information on the school and its hiring program, visit us online at [www.jsg.utexas.edu/hiring](http://www.jsg.utexas.edu/hiring).

A Ph.D. is required at the time of appointment. An application should note the title of the advertisement you are responding to and include a cover letter, CV, list of publications, list of references, statements of research and/or teaching interests, sent to Randal Okumura, Office of the Dean / Jackson School of Geosciences, The University of Texas at Austin / PO Box B, University Station / Austin, TX78713 or [jobs@jsg.utexas.edu](mailto:jobs@jsg.utexas.edu).

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Applications should include a current curriculum vitae, a statement of research interests, and a statement of teaching philosophy. Applicants should also arrange for three confidential letters of reference to be sent to Dr. Martin Sharp as soon as possible. Consideration of applications will begin March 15, 2009; however the competition will remain open until a suitable candidate is found. The start date for this position is July 1, 2009. Please visit [www.careers.ualberta.ca](http://www.careers.ualberta.ca) and select Academic then the Faculty category to view the full position details and to apply online.

**Interested applicants may apply to:**

Dr. Martin Sharp, Chair  
Department of Earth & Atmospheric Sciences  
University of Alberta  
Edmonton, Alberta T6G 2E3  
Canada

Email: [judith.enarson@ualberta.ca](mailto:judith.enarson@ualberta.ca)

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**Assistant or Associate Professor in Hydrocarbon Geoscience**



GEOLOGY & GEOPHYSICS DEPARTMENT AND  
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The Geology and Geophysics (GG) Department and the Energy & Geoscience Institute (EGI) at the University of Utah invite applications for a tenure-track faculty position in GG at the Assistant or Associate Professor level, beginning July 1, 2009. The successful candidate will bring expertise in hydrocarbon energy research and will develop a strong, externally funded and internationally recognized research program involving students and industry. Teaching responsibilities will include development of new undergraduate- and graduate-level courses and integration with existing courses in GG's Petroleum Industry Career Path. The appointee will participate in collaborative efforts between GG and EGI. The GG Department and EGI share thriving research and academic programs in petroleum geology and geophysics and allied areas of the geosciences, including EGI's Corporate Associate program. The position will have offices at both organizations, and communication and leadership skills as well as teamwork experience are important. We also offer state-of-the-art facilities including the new Frederick A. Sutton Building. More information can be found online at [www.earth.utah.edu](http://www.earth.utah.edu) and [www.egi.utah.edu](http://www.egi.utah.edu).

The area of specialization is open but possibilities include geologic interpretation of geophysical data, new methodologies for subsurface imaging, petrophysics, rock fracture mechanics, reservoir characterization and engineering, multiphase fluid flow, and geostatistical modeling. Multiple opportunities for collaboration and funding exist, including capitalizing on emerging interest in unconventional resources.

Candidates must have a completed Ph.D. at the time of appointment and a strong record of research and publication. Applications are being accepted now; review of applications will begin on January 15, 2009, and will continue until the position is filled. Applicants should submit an application letter indicating research, teaching and programmatic interests and agenda, curriculum vitae, and names and contact information of three professional references to:

Chairs of the Hydrocarbon Geoscience Search Committee  
Geology and Geophysics Dept., University of Utah  
135 South 1460 East, WBB 719  
Salt Lake City, UT 84112

Complete applications may also be sent in PDF format by email to [Kristin.Christensen@utah.edu](mailto:Kristin.Christensen@utah.edu). Questions can be addressed to Cari Johnson ([Cari.Johnson@utah.edu](mailto:Cari.Johnson@utah.edu)) or Ray Levey ([RLevey@egi.utah.edu](mailto:RLevey@egi.utah.edu)).

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## DIRECTOR'S corner

## Quote: Education Is Opportunity

By RICK FRITZ

Before writing this column I checked a few books and the Web to see what the wisest people in the world said about "education."

"All learning has an emotional base," was Plato's quote.

"Education is the ability to listen to almost anything without losing your temper or your self-confidence," was Robert Frost's quote.

Actually, the more I tried to educate myself on the educators, the more I found myself getting confused. So I will just summarize by stating the Greek proverb, "Whatever is good to know is difficult to learn."

\* \* \*

Continuing education is an important program for AAPG.

During the boom of the late 1970s AAPG built a robust educational curriculum; since that time AAPG's educational offerings have expanded or declined based on the vitality of the industry. Generally, 5-6 percent of AAPG members each year take advantage of our training programs, including field trips.

Every two or three years AAPG staff and members conduct an analysis of all AAPG programs to see which ones we should keep, grow or sunset. This year's analysis recommends that AAPG should either "build up or sell out" on education.

This does not mean that AAPG's educational program is "broken," rather it means there is significant opportunity to grow! As a result, one of AAPG headquarters' key New Year's resolutions is to make a major step-change in improving



Fritz

One of AAPG's key New Year's resolutions is to make a major step-change in improving and expanding our professional development program.

and expanding our professional development program.

After intense study last year we decided the best step was to make the education department into a separate "Education and Professional Development Directorate."

Of course, a key part of building a new directorate is finding the right director. We were fortunate to hire Susan Nash, an AAPG member who has a long history of developing education programs around the world (January EXPLORER).

The new directorate will be responsible for AAPG short courses, conferences, field trips, Hedberg workshops, Distinguished Lecturers and AAPG's oversight and support of the Petroleum Technology Transfer Council (PTTC). Susan also will provide oversight of AAPG's K-12 activities.

\* \* \*

One of the Education Directorate's first goals is to conduct a "needs analysis" and build new curriculum. In the past AAPG has had success in finding new instructors who bring "cutting-edge" ideas to the membership.

Fortunately, Susan has a good staff to

build on and several excellent committees to develop ideas and curriculum. The three key committees are:

- ✓ The Education Committee, co-chaired by Janok Bhattacharya and Skip Rhodes.
- ✓ The Research Committee, co-chaired by Ron Nelson and Ken Peters.
- ✓ The Distinguished Lecturer Committee, co-chaired by Mark Cooper and Lee Krystinik.

Of course, there are several other AAPG committees that feed ideas into the education program.

In addition to committee support, Susan and her staff will be conducting interviews with industry representatives and the general membership to develop new opportunities.

Concerning PTTC – a key goal will be to work with PTTC to build a "two-way street" of educational opportunities that can be used both by AAPG and PTTC. One of the first of these programs is to build a strong shale-gas curriculum from upstream to downstream.

\* \* \*

One of AAPG's new mechanisms for training is our new Geoscience

Technology Workshops (GTW). The development of this concept was led by Alan Wegener, AAPG's director of global development and conferences. Alan helped develop SPE's Advanced Technology workshops when he worked for SPE in the 1990s.

The purpose of our GTWs is to deliver up-to-date technical content to AAPG members and the industry. GTWs address current issues and challenges, and they will include geological perspectives integrated with those of other related disciplines.

The individual GTWs are organized by a leading expert on a particular timely subject. This lead presenter identifies presenters and works with the education directorate on curriculum. Staff from AAPG's global development and conference directorate will handle worldwide logistics.

GTWs are designed for development in a relative short time period (less than six months) so timely information can be disseminated.

\* \* \*

AAPG is looking for "a few good women and men" to teach new ideas. If you are interested please contact Susan at snash@aapg.org.

"Education is opportunity." That is my quote and I'm sticking to it.

## EMD

from page 46

(1.4 billion cubic feet per day) for every 10 GW of coal capacity replaced by gas generation. If there is a moose in the room, this is it.

Power sector demand growth will not materialize in time to prevent the looming oversupply from gas shales/Rockies production, but it certainly appears capable of stressing supplies (and widening the door to LNG imports) in the post-2015 period.

\* \* \*

While coal's future is uncertain and insecure, the exact opposite is true of its present role – both domestically (it provides 49 percent of U.S. power generation) and internationally (see our eye-opening comments on China below).

Volatility and globalization are the two watchwords that best describe the current market.

During 2008 U.S. coal prices were buffeted as never before by international forces. Between the summers of 2007 and 2008 prices at the three principal export hubs of Newcastle, Australia (principally to Asian markets), Richards Bay, South Africa (principally to Amsterdam-Rotterdam-Antwerp or ARA) and Colombia (to ARA and the United States) rose from about \$60/metric ton to \$160. This is astonishing.

It was accompanied by the added burden of unprecedented hikes in dry bulk shipping costs (e.g., from a norm of \$15-20/metric ton to \$50 for Richards Bay to ARA), it had very little to do with oil's coincident price escalation and, among other things, it led to expansion of the

Top Exporters*	2007 Reserves (BP)			2007 Reserves (BP)			Hard Coal P/R and R/P**		
	Thermal	Met	Exp. Total	Anthracite & Bit	Subbit. & Lignite	Reserves Total	Prod'n* Hard coal	P/R (%)	R/P (years)
Australia	111.6	120.5	232.1	37,100	39,500	76,600	309	0.8	120
Indonesia	170.0		170.0	1,721	2,607	4,328	169	9.8	10
Russian Fed'n	81.7	15.8	97.5	49,088	107,922	157,010	233	0.5	210
South Africa	67.7		67.7	48,000		48,000	244	0.5	196
China	58.9	4.8	63.7	62,200	52,300	114,500	2,383	3.8	26
Colombia	59.7		59.7	6,578	381	6,959	64	10.0	103
United States	19.9	25.8	45.7	112,261	130,460	242,721	977	0.9	115
Canada	3.2	27.4	30.6	3,471	3,107	6,578	26	0.8	132
Poland	13.1	3.1	16.2	6,012	1,490	7,502	94	1.6	64

Figure 3

United States' usually very modest role as a coal exporter (to ARA) and a wave of price escalation in U.S. coal prices.

Metallurgical coal prices experienced a similar but even more extreme rise (e.g., the annual settlement of Japanese high quality hard coking coal went from \$100/metric ton in 2007 to \$300 in April 2008).

The journey of U.S. spot coal prices is summarized in EIA's price chart (figure 2, page 46). Northern and Central Appalachian prices went from \$45/short ton to \$140-150 between summers of 2007 and 2008.

Illinois Basin prices, not directly participating in the export market and slightly lagging Appalachian movements, climbed from \$30/short ton to an equally astonishing \$90.

The principal question in U.S. and international markets now is "how hard will these prices fall?"

Hard times to come are indicated in the stock values of coal producers, which have dropped sharply since July, preceding by

several months the emergence of the global financial crisis.

\* \* \*

No comments about coal, however cursory, would be complete without a few words about China, for two reasons:

✓ China is the world's largest and fastest growing producer and consumer of coal, by a factor of 2.2 or more.

✓ While almost 100 percent self-sufficient, China's small shift from being a net exporter to a net importer of coal during early 2008 was one of many factors behind the anomalous global price surge.

China's industrialization has brought about nearly incomprehensible changes in its infrastructure. In 2006, 102 GW of new generating capacity was added in China, and the pace of development over the past three years has been estimated as equivalent to adding three to four 500-megawatt power plants per week.

About half of the coal produced in China is used to make electricity, and

about 80 percent of the country's electric generation is derived from coal.

Power sector growth has been the primary engine behind China's growing coal consumption and production. Production doubled between 2001 and 2006. It is this phenomenon that is behind BP's observation when releasing its 2008 Statistical Review that "coal was again the fastest growing fuel in 2007."

And it also is behind growing recognition by world policymakers that development in China is the trump card in controlling CO<sub>2</sub> emissions.

\* \* \*

Discussions about coal as an energy resource often turn to its reserves, resources and global distribution. For those concerned with world energy developments, it makes sense to focus on countries that are most important in the world coal trade. This is done in the following table (figure 3), which ranks countries by their combined exports of thermal and metallurgical coal.

While Australia is at the top, Indonesia is the fastest growing exporter – and by 2006 it was the world leader among exporters of thermal coal, 50 percent greater than Australia.

Indonesia's electricity needs also have been rapidly growing, which is leading to policies to assure sufficient supplies to serve its domestic markets.

Rather than attempt to answer the many questions a table such as this may raise, we leave it as a portrayal of some of the features of the global coal industry. □

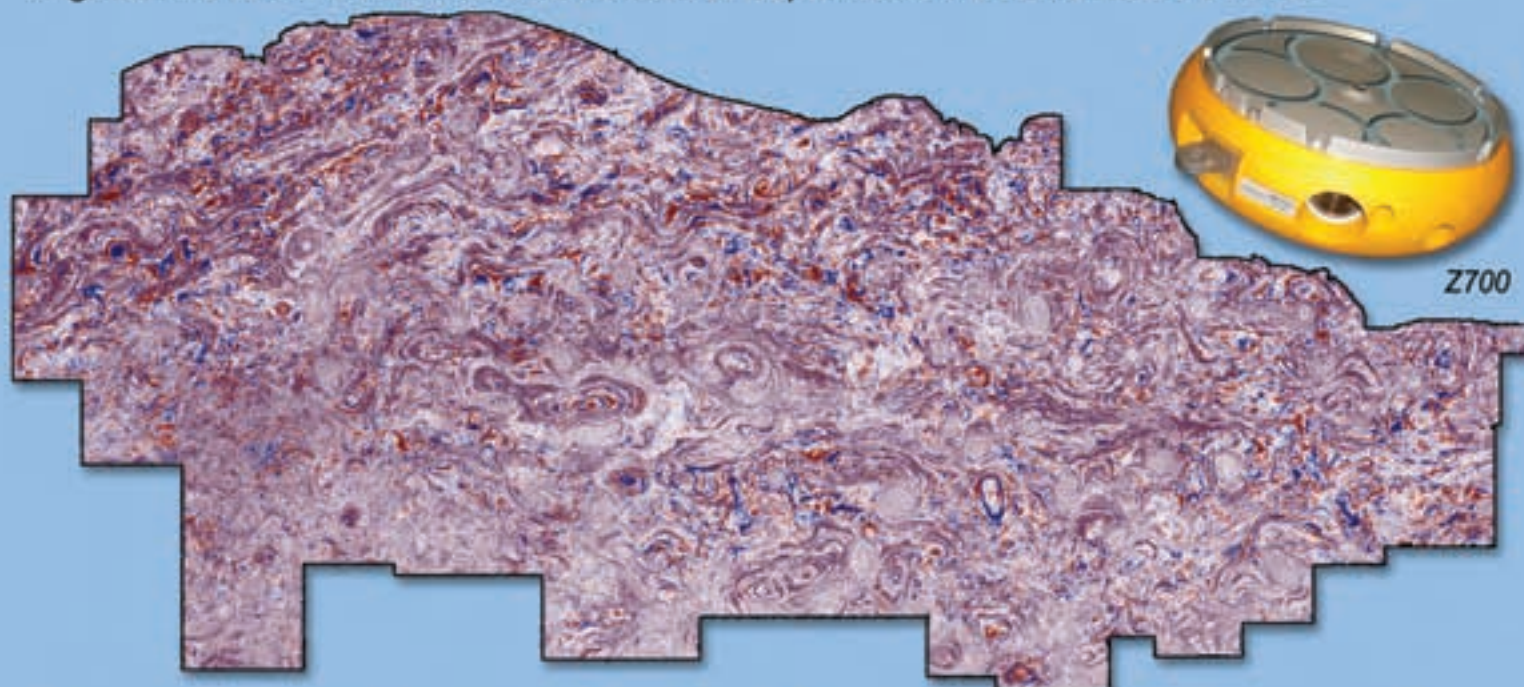
(Editor's note: Platt is chair of the EMD Economics Committee, and Ambrose is chair of the EMD Coal Committee.)



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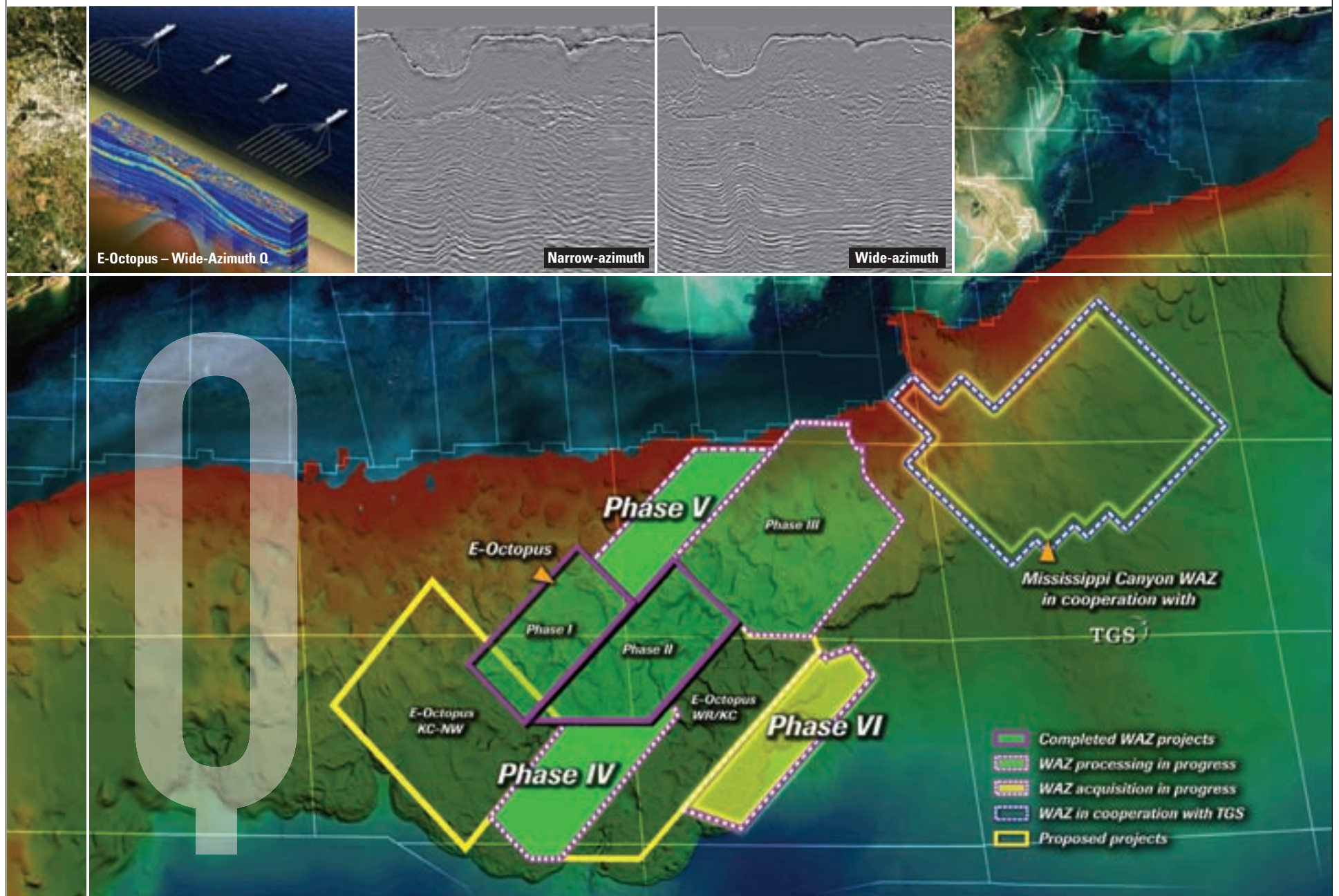
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