

AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

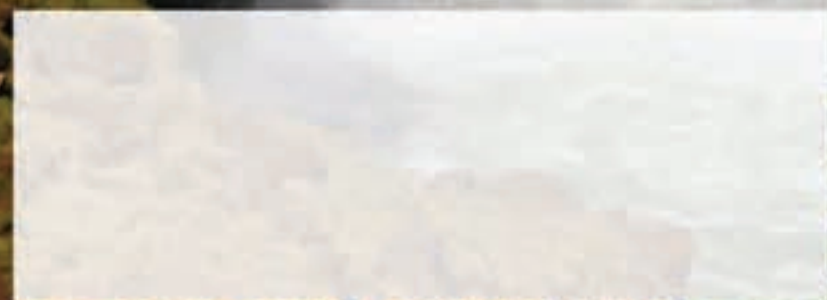
EXPLORATION

OCTOBER 2009

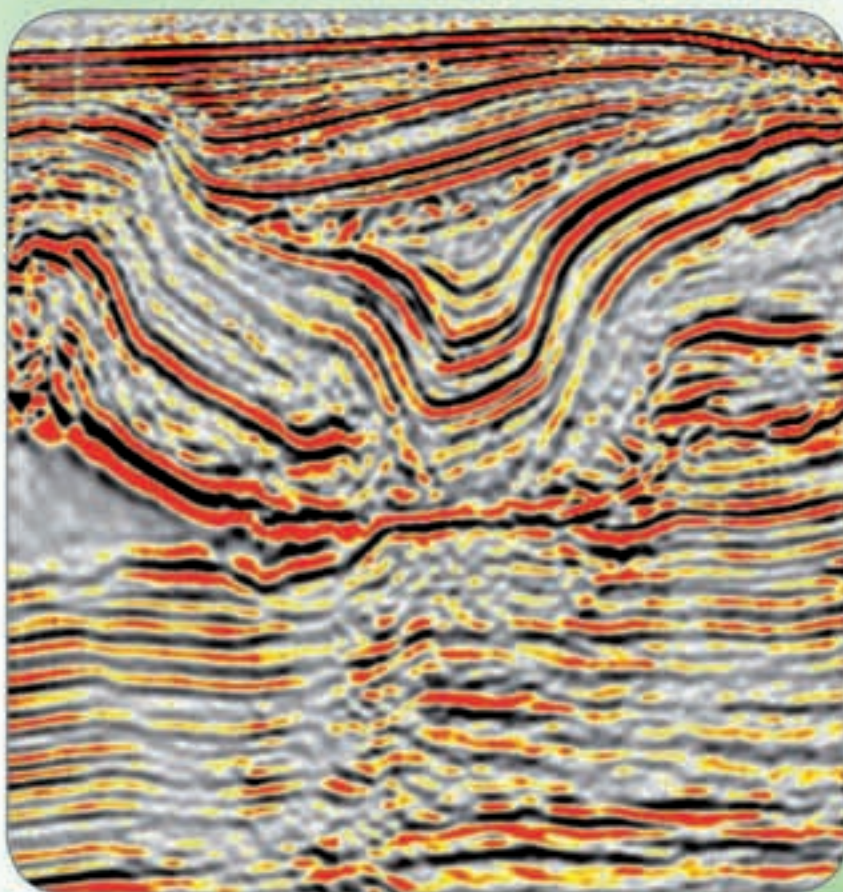
Incrível Aventura

Falling for a land of geologic wonder

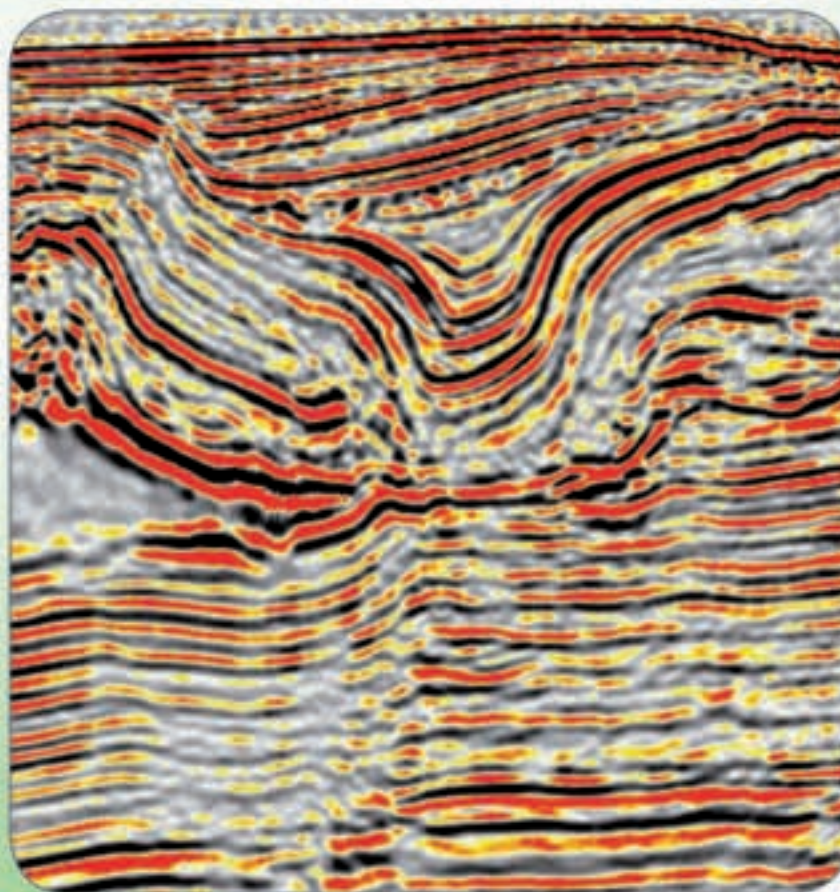
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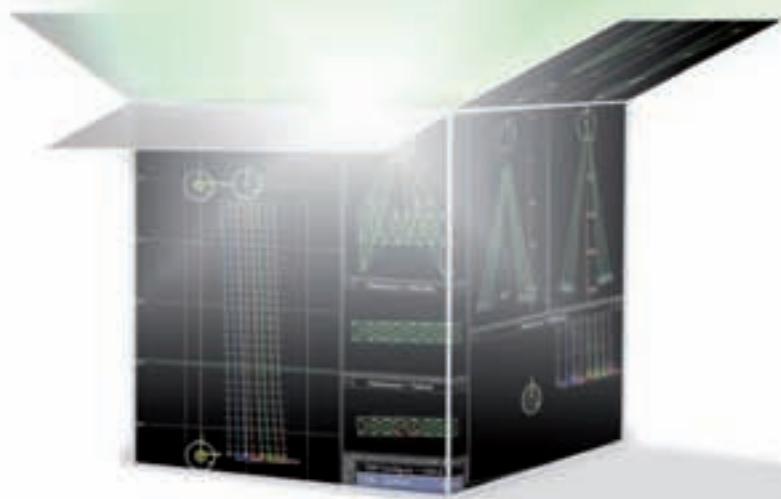
The Power of Creativity



Isotropic RTM from the Walker Ridge WAZ multi-client survey, Gulf of Mexico



TTI-RTM from the Walker Ridge WAZ multi-client survey, Gulf of Mexico



TTI-RTM WIDE-AZIMUTH IMAGING

CHALLENGE

- To enhance subsalt seismic images in the deepwater Gulf of Mexico to help geoscientists generate a more accurate understanding of the subsurface for improved exploration, production and development.

SOLUTION

- Wide-azimuth data acquisition coupled with the CGGVeritas proprietary TTI-RTM (Tilted Transverse Isotropic – Reverse Time Migration) imaging technology provides enhanced illumination of subsalt reservoirs and produces more coherent and focused subsalt images.

RESULTS

- Consistently, TTI-RTM produces more coherent and focused subsalt images based on a high-fidelity velocity model and clearly defined salt geometry, which incorporate the TTI wave propagation effect.



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On the cover: A perfect geologic – and beautiful – complement to any trip to Brazil is a visit to the Iguaçu waterfalls, a UNESCO World Heritage Site situated on the country's border with Argentina. The powerful falls flow over the Cretaceous volcanic rocks of the Serra Geral Formation of the Parana Flood Basalt Province; the basalts were extruded during the early sea-floor spreading phase of the continental break-up between South America and Africa about 132 Ma. A visit to the falls is included in one of the five field trips set in conjunction with the upcoming AAPG International Conference and Exhibition in Rio de Janeiro. See page 40. Photo by AAPG member Vaughn Thompson. And for those not residing in Brazil, "Incrível Aventura" means amazing adventure. And it is.

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STAFF

AAPG Headquarters – 1-800-364-2274 (U.S. & Canada only), others 1-918-584-2555

Communications Director
Larry Nation
e-mail: lnation@aapg.org

Managing Editor
Vern Stefanic
e-mail: vstefan@aapg.org

Communications Project Specialist
Susie Moore
e-mail: smoore@aapg.org

Correspondents
David Brown
Louise S. Durham
Barry Friedman

Graphics/Production
Matt Randolph
e-mail: mrandolph@aapg.org

Advertising Coordinator
Brenda Merideth
P.O. Box 979
Tulsa, Okla. 74101
telephone: (918) 560-2647
(U.S. and Canada only:
1-800-288-7636)
(Note: The above number is for
advertising purposes only.)
fax: (918) 560-2636
e-mail: bmer@aapg.org



Photo courtesy of Drake Well Museum

AAPG President John Lorenz presented a plaque from AAPG commemorating the 150th anniversary of the Col. Edwin Drake discovery of oil in Titusville, Pa., during ceremonies in late August at the Drake Museum in Titusville. From left is Barbara Zolli, director of the Drake Well Museum, Lorenz, AAPG member Larry Woodfork – a member of the Oil 150 Celebration Committee – and, of course, Col. Edwin Drake (as per a locally hired actor).

PRESIDENT'Scolumn

It's About The Science

By JOHN C. LORENZ

Don't let anyone tell you differently: Geology is a difficult science. Strictly speaking, geologists can't use the scientific method of hypothesis-test-analysis-conclusion because most geologic problems deny us the critical experimentation stage. Instead, we're presented with the superimposed results of several of nature's ancient experiments and asked to sort them out. To add insults to the mix, we're given only incomplete datasets with which to do the sorting, and we are evaluating rocks that are inaccessible in the subsurface.

The incomplete nature of the datasets makes it difficult to predict the attributes of a reservoir. Characterizing a reservoir with outcrop, core and geophysical data is akin to reconstructing the outlines and mechanics of an automobile using a couple of fenders from what might be a similar model found in a junkyard, a few samples of the paint and by looking at the car from a distance through a heavily smoked piece of glass. The reconstruction is aided by the theoretical knowledge that the car probably had four wheels and an engine. Is it a 1956 Buick or a 2009 Volvo? Such reconstructions are not easy, yet we consistently make them with a high enough degree of success to keep employers and investors happy.

Our scientific and economic successes are due to our ability to think in four dimensions, both constrained and inspired by geologic theory. The ability to think in four dimensions results from formal education reinforced by experience. Geologists who have enough education and experience to be able to say "I've seen something like that before" are ahead of the game. Personal experience derived from longevity count for much in this profession, but no one can experience it all.

Enter AAPG.

Four of the seven purposes of AAPG, as outlined in our Constitution, are related to fostering and disseminating hydrocarbon-related geoscience: We are a science-based association.

Fostering advances the science, promoting and supporting research. AAPG helps push back the forefronts of science by supporting student research and providing the potential for connections between academia and industry. Programs are in the works to expand that support, including one that brings together industry funding,



Lorenz

academic research, and the National Science Foundation.

Dissemination makes sure that the results of research, whether fostered by AAPG or by other entities, becomes available to the people who can use it.

Research that doesn't get published or at least presented at a meeting might as well be a hobby. AAPG online and hardcopy publications, plus various AAPG-sponsored technical meetings and programs, disseminate geoscience with remarkable efficiency considering the basically disorganized nature of this profession.

This year's presidential program is wrapped around the concept that geoscience is the core of AAPG. Part of the program is aimed at making people aware of the reality that AAPG is the world's premier broker of hydrocarbon-related geoscience. Another part of the program is aimed at enhancing that reality by encouraging programs such as the Hedberg research forums, the previously mentioned financial support for research and vital programs such as field seminars.

If you're lucky enough to get outside and onto outcrops regularly, you know that in addition to enjoyment of some rather scenic parts of the world, outcrop work leads to both enlightenment and humility. Outcrop work modifies the concepts one carries from the office according to the reality of the rocks and leads to new concepts, while new and sometimes embarrassing questions arise with unsettling frequency. This is geoscience in action. Getting something useful out of that geoscience involves testing those ideas, developed on the basis of the outcrop and subsurface data, by drilling. AAPG was formed so that we would have that geoscience to apply to the practical problems of finding and recovering the hydrocarbons that run civilization.

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They'll be honored in New Orleans

Brown, Gratton Top Awardee List

By SUSIE MOORE

Communications Project Specialist

L. Frank Brown Jr., a leader in research and development of the concept of depositional system tracks, seismic stratigraphy and sequence stratigraphy, has been named the 2010 recipient of the AAPG's prestigious Sidney Powers Award.

Joining him at the top of the awardees list is **Patrick J.F. Gratton**, independent geologist and president of Patrick J.F. Gratton Inc. of Dallas, and a past AAPG president, who is this year's recipient of the Michel T. Halbouty Outstanding



Brown



Gratton

Leadership Award.

Brown and Gratton head a list of 33 AAPG award winners, all of whom will be

recognized at the opening session of the 2010 AAPG Annual Convention and Exhibition, set April 11-14 in New Orleans.

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

Brown, professor emeritus at the Bureau of Economic Geology, began his career at the BEG in 1957, having faculty appointment at the University of Texas at Austin in 1966-89. He also taught at Baylor University in 1960-69 and worked

as a full-time consultant in 1989-98.

Brown has served as a mentor to scientists and geoscientists at the BEG as well as leading industry companies all over the world and has contributed to many publications, including AAPG Studies in Geology 41 – an atlas of exploration for Cretaceous lowstand traps.

He is a recipient of the AAPG Pioneer Award, and has served as AAPG BULLETIN associate editor, AAPG Distinguished Lecturer – both domestic and international – and as the leader of short courses and many field trips.

Gratton is the fourth recipient of the Halbouty Outstanding Leadership Award, given in recognition of outstanding and exceptional leadership in the petroleum geosciences.

Interviews with both Brown and Gratton will be published in a future EXPLORER, and biographies and citations of all award winners will be included in a future BULLETIN.

Those award winners approved by the Executive Committee and who will be honored along with Brown and Gratton in New Orleans are:

Honorary Member Award

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

☐ **Adebayo O. Akinpelu**, Chevron, San Ramon, Calif.

☐ **John R. Hogg**, MGM Energy, Calgary, Canada.

☐ **Pinar O. Yilmaz**, ExxonMobil, Houston.

Outstanding Explorer Award

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

☐ **John J. Amoruso**, Legends Exploration, Houston.

☐ **J. Denny Bartell**, Legends Exploration, Houston.

☐ **Larry Bartell**, Legends Exploration, Houston.

Robert R. Berg

Outstanding Research Award

☐ **Martin P.A. Jackson**, Bureau of Economic Geology, Austin, Texas.

Distinguished Service Award

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

☐ **Martin M. Cassidy**, consultant, Cypress, Texas.

☐ **Rebecca L. Dodge**, Midwestern State University, Wichita Falls, Texas.

☐ **Bob A. Hardage**, Bureau of Economic Geology, Austin, Texas.

☐ **Dwight "Clint" Moore**, ION Geophysical, Spring, Texas.

☐ **Terence G. O'Hare**, Emerald Energy, Dallas.

☐ **Craig W. Reynolds**, Cobra Oil and Gas, Wichita Falls, Texas.

☐ **John W. Robinson**, North Ranch Resources, Littleton, Colo.

Grover E. Murray

Distinguished Educator Award

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

See **AAPG Awards**, page 6

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EUInquiries@weatherfordlabs.com

LATIN AMERICA
LAInquiries@weatherfordlabs.com

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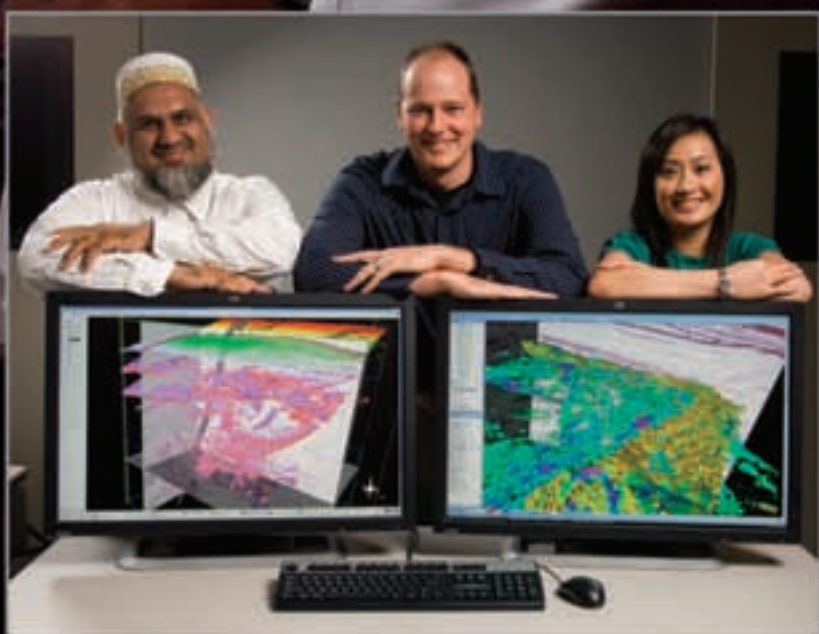
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AAPG Awards

from page 4

and toward education of the general public.

- Wayne M. Ahr, Texas A&M University, College Station, Texas.
- Eric A. Erslev, Colorado State University, Fort Collins, Colo.
- Murray K. Gingras, University of Alberta, Edmonton, Canada.

Special Award

Presented to individuals and organizations whose area of work may not qualify for one of the existing awards, but is worthy of Association recognition.

- Robert W. Allen, independent, Ardmore, Okla.
- George P. Mitchell, founder and former chairman and CEO of the Mitchell

Energy and Development Corp., The Woodlands, Texas.

Public Service Award

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

- Thomas C. Burgeon, Century Exploration, Metairie, La.
- Ahmed N. El Barkooky, Shell Egypt and adjunct professor at Cairo University, Egypt.
- William B. Harrison III, Western Michigan University, Kalamazoo, Mich.
- Tako Koning, Chevron Angola, Bellaire, Texas.

Pioneer Award

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

- Thomas D. Barrow, Houston.

Wallace E. Pratt Memorial Award

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

- David R. Pyles, for “Multiscale Stratigraphic Analysis of a Structurally Confined Submarine Fan: Carboniferous Ross Sandstone, Ireland,” which appeared in the May 2008 BULLETIN (volume 92, number 5). Pyles is with the Chevron Center of Research Excellence, Colorado School of Mines, Golden, Colo.

Robert H. Dott Sr. Memorial Award

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

- Stephen P. Cumella, Keith W. Shanley and Wayne K. Camp for editing “Understanding, Exploring and Developing Tight-Gas Sands: 2005 Vail

Hedberg Conference.” Cumella is with Bill Barrett Corp., Evergreen, Colo., Shanley is a consultant in Littleton, Colo., and Camp is with Anadarko Petroleum, Houston.

George C. Matson Award

Presented to honor and reward the best oral presentation at the AAPG Annual Convention in Denver.

- Barbara Tilley, with the University of Alberta, Edmonton, Canada, for the paper “Isotopic Evidence for Fault-Induced Gas Mixing in Sweet Spots of the Sukunka Gas Field, Western Canadian Foothills.” Her co-authors were Pradeep Bhatnagar, Scott McLellan, Bob Quartero and Byron Veilleux, all with Talisman Energy, Calgary; and Karlis Muehlenbachs, with the University of Alberta.

Jules Braunstein Memorial Award

Presented to honor and reward the best poster presentation at the AAPG Annual Convention in Denver.

- Nikki Hemmesch and Nicholas Harris, for the poster “Sequence Stratigraphic Architecture for the Late Devonian Woodford Shale, Southern Permian Basin, West Texas.” Hemmesch will be honored posthumously in New Orleans; the awards announcement came shortly after she died suddenly on July 9 (see August EXPLORER). Hemmesch was a graduate student and Harris her professor and adviser at the Colorado School of Mines, Golden, Colo. □

Candidates' Bios, Replies Are Online

Biographies and individual information for all AAPG officer candidates for the 2010-11 term continue to be available online at www.aapg.org/business/candidates/index.cfm.

Also included on that page is a link to the complete list of campaign rules, which govern election administration and protocol.

This year's slate involves candidates for four positions.

The president-elect winner will serve in that capacity for one year and will be AAPG president in 2011-12. The vice president-Sections and treasurer winners serve two-year terms, and the elected-editor serves a three-year term.

Ballots will be mailed in spring 2010.

The slate is:

President-Elect

- Ernest A. Mancini, University of Alabama, Tuscaloosa, Ala.
- Paul Weimer, University of Colorado, Boulder, Colo.

Vice President-Sections

- Marvin D. Brittenham, EnCana Oil & Gas (USA), Denver.
- Charles A. Sternbach, Star Creek Energy, Houston.

Treasurer

- James S. McGray, Mid-Con Energy, Tulsa.
- James W. Tucker, Saudi Aramco, Dhahran, Saudi Arabia.

Editor

- Ashton F. Embry, GSC, Calgary, Canada.
- Stephen E. Laubach, Bureau of Economic Geology, University of Texas at Austin.

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Steve Jackson, Geophysicist,
Texas Standard Oil & Gas, LP

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*Carol Shiels, Geologist, Shiels Engineering

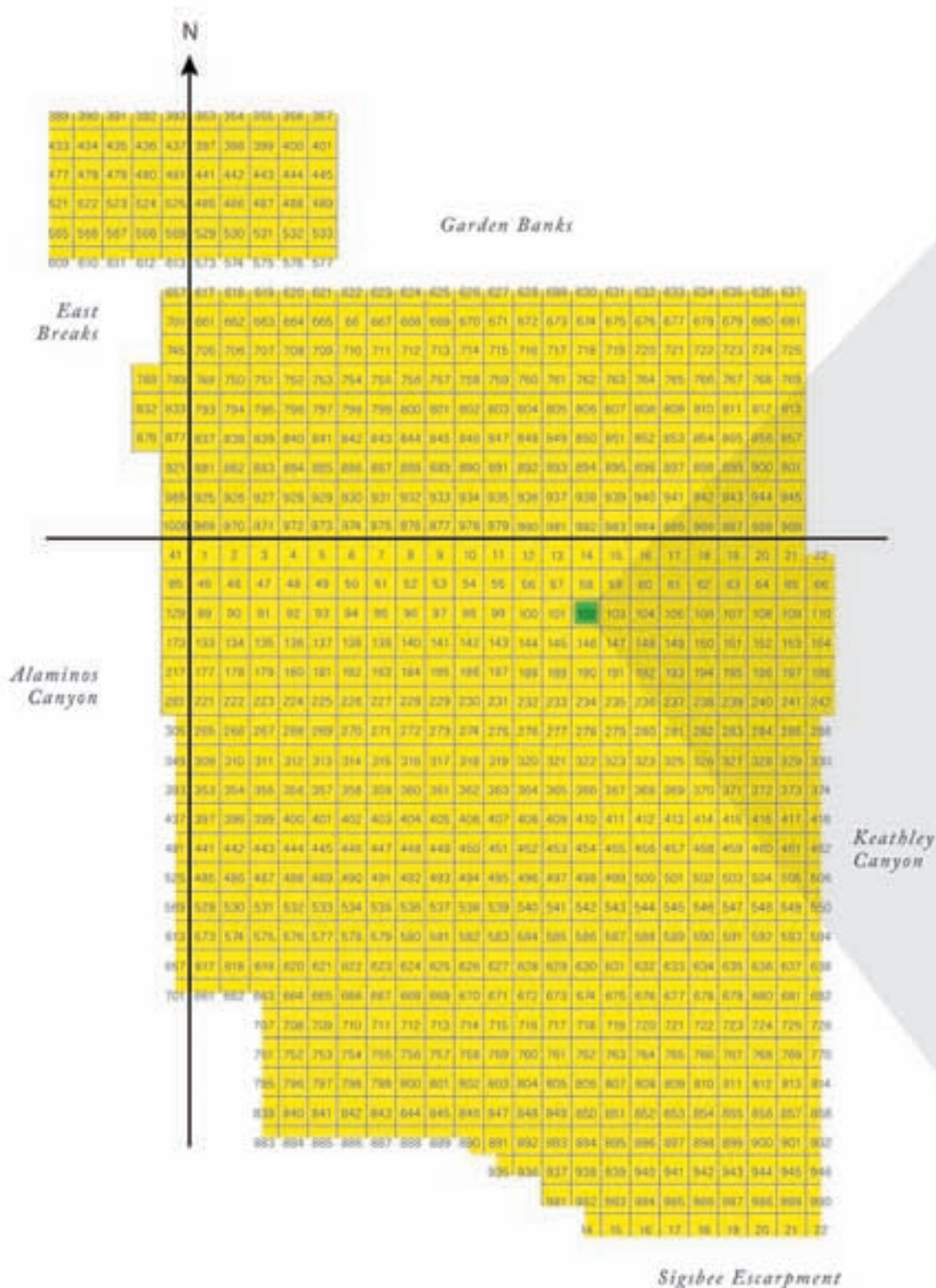
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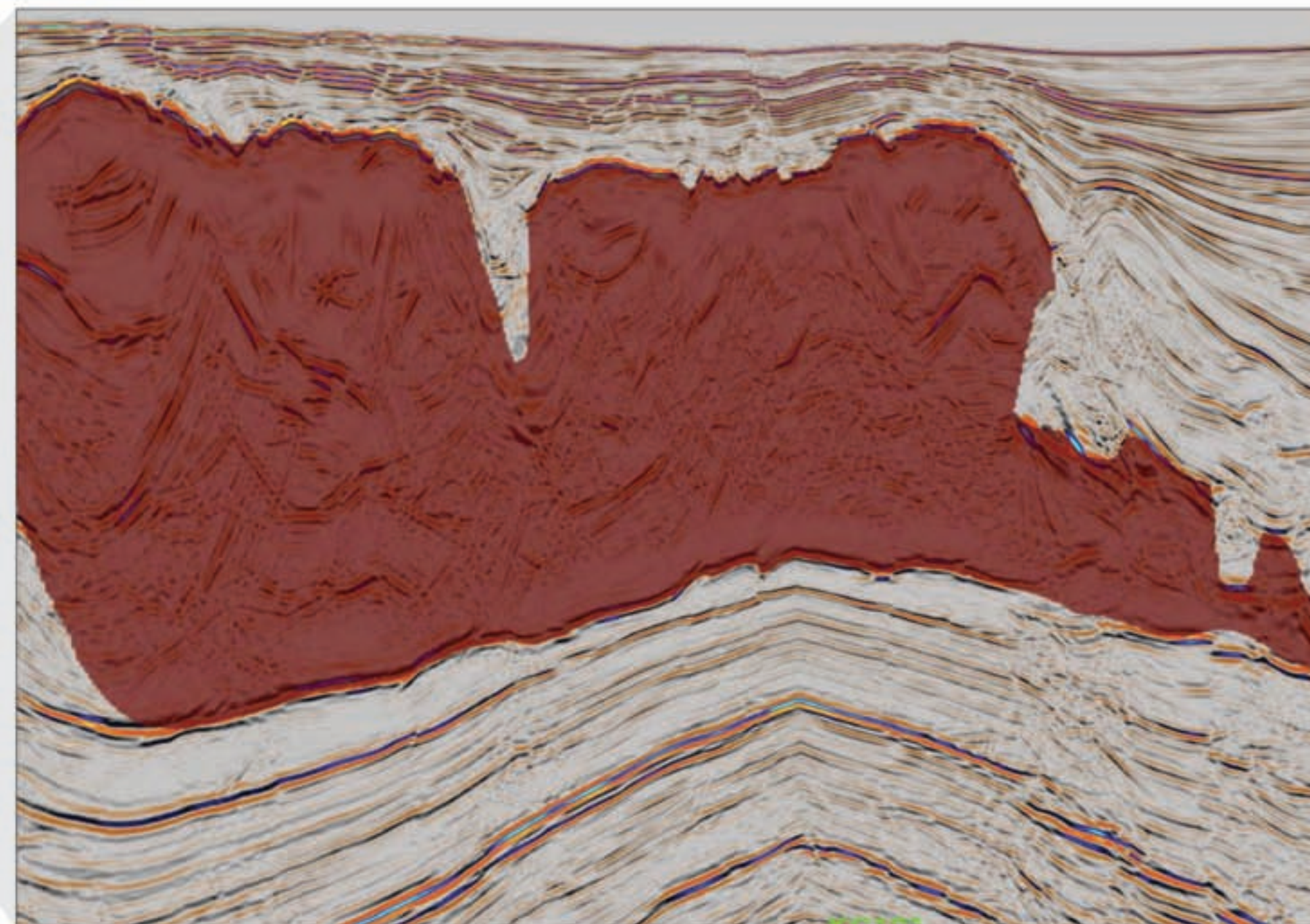


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3-D next Signal Hill step

Urban Seismic Shoot Successful

By LOUISE S. DURHAM
EXPLORER Correspondent

Seismic data acquisition projects can be thorny deals to put together and apply – especially in highly populated urban areas.

Toss in even a soupçon of environmental sensitivity, and the challenges begin to mount.

If you're contemplating a venture in a crowded urban environment in California, for instance, you might be justified in running in the opposite direction - right? Not necessarily.

Particularly if you're an operator who is recognized for your good-neighbor status in the community.

And if you're also equipped with a seismic data acquisition system that operates sight-unseen, which is about as unobtrusive as it gets.

That's the can-do message emanating from those involved in a recently completed successful 2-D seismic shoot in the Long Beach/Signal Hill oil field.

Eighty percent of the field is found in Signal Hill, which is a two-square mile community of 10,000 residents, surrounded by the 50-square mile city of Long Beach and its half-million residents, according to Dave Slater, executive vice president and chief operating officer of Signal Hill Petroleum. Long Beach is home to the remaining 20 percent of the oil field.

Signal Hill Petroleum operates the majority of the field where it currently produces 2,800 bopd. Production from the next largest operator stands at 300 bopd.

For the seismic operation the company contracted for Fairfield Industries' Z Land™ nodal seismic data acquisition system.

Long Beach/Signal Hill qualifies as one of the giant fields in the United States, having kicked out more than one billion barrels of oil to date. Slater noted it has the highest recovery per surface square foot of productive area of any field in the world.

"We estimate there's up to two billion barrels of oil still in place," Slater said. "Modern seismic technology has not been applied to most of the Los Angeles Basin, and the issue has been how to conduct seismic operations in this very dense urban environment."

Like a Good Neighbor ...

The company attempted to conduct a 3-D survey over the LB/SH field in 2006, but it was nixed early on owing to concerns from the citizenry about the effects of the seismic vibrators.

It was back to the drawing board to carefully formulate a plan that would fly.

"In this area, most fields are behind a wall, but we're spread out," said AAPG member Dan Hollis, vice president for geophysics and technology development at Signal Hill subsidiary Seismic Imaging Solutions, which operated the recent Z Land survey.

"We have wells in parking lots, commercial centers, empty lots next to homes, so we're very into the community," Hollis emphasized. "We're very conscious about being very neighbor friendly – that was the whole driving paradigm."

Slater noted they earlier acquired some seismic data in the area using a conventional industry contractor – and quickly learned the difficulty in working in an urban area and managing cables.

They re-grouped to evaluate what was



essential to success in seismic operations in a citified environment. Due diligence on available equipment and technology ultimately convinced them to zero in on Fairfield's system given that its continuous recording Autonomous Recording Unit (ARU) is 100 percent free of external cables and other external components.

"This particular field locale is one of the challenging types of environment we had in mind when developing Z Land," said Steve Mitchell, Fairfield's vice president and division manager. "The dense urban conditions and our Z Land system essentially were meant for each other."

Signal Hill pulled together its plan to conduct the LB/SH program and presented its case for the survey to the powers-that-be.

Besides the expected dialogue with an array of public officials, the company hosted a public demonstration of a vibrator shaking the ground for an audience comprised of city council members of the two cities involved.

"In the end it was, 'Well, is that all there is to it?'" commented Serge Rambaud, sales manager for the Americas at Fairfield.

The Passing Parade

Once the public officials and private property owners were on board, two permits were acquired from each city, including the expected public works permit.

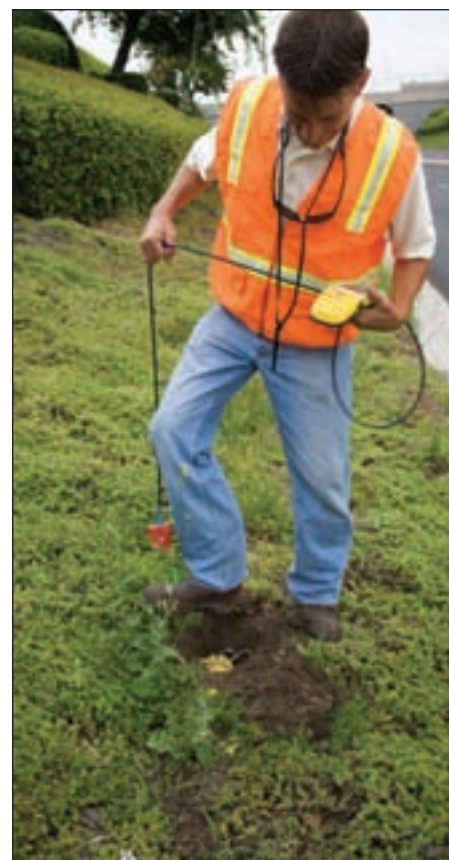
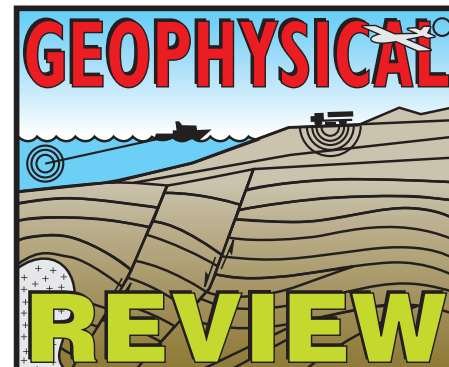
But this is California, where the ordinary sometimes takes on a unique twist.

The other required piece of paper was a special events permit. In essence, it was – don't laugh – a parade permit for the vibrators to vibrate down the streets like a slow moving parade.

Prior to the survey, Signal Hill prepared a professional brochure explaining details of the project in a manner the layperson could understand. These brochures were distributed to residents and others in the survey locale.

In areas where the ARUs (frequently referred to as nodes) couldn't be placed on a public right-of-way and private property had to be used, Hollis noted the landowners were very receptive. This meant the crew could find soil everywhere necessary – even in this urban setting that essentially has more concrete than dirt.

This access to terra firma was crucial



Photos courtesy of Fairfield Industries

Completing a successful seismic operation in the Long Beach/Signal Hill oil field was possible thanks to community awareness, improved cableless technology, environmental sensitivities and a willingness for crews and the city to find common ground. No pun intended.

to the project, which was a kind of "now you see them, now you don't" operation.

The ARUs are buried beneath the ground's surface. The operator drills an eight-inch hole where he places these self-contained easy-to-handle units, covering them with a couple of inches of soil.

It's a smooth operation given that the 4.7-pound ARUs each boast a height of only six inches and a five-inch diameter. There's a five-inch detachable spike on the bottom.

The complete absence of cables and other external components is visually pleasing, but the advantages of the system extend far beyond the visual in such a congested urban setting.

"The biggest impact of this system is that with no cables, there's no troubleshooting of the equipment," said AAPG member Hilario Camacho, vice president of earth sciences and exploration at Signal Hill. "You just lay out the nodes and get the sources going, and we got the survey done in a short time."

"It was great, very good," Camacho exclaimed.

See **Signal Hill**, page 12

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What, no elephants? Getting the equipment in place for the Signal Hill operation required crews to get a parade permit for the vibrators to vibrate down the streets of Long Beach.

Signal Hill from page 10

Another plus in having absolutely no cables is that cables present a trip-and-fall hazard, which can be particularly problematic in this kind of crowded, busy environment, Hollis pointed out.

He noted also they restricted the operational hours in the populated areas to reduce the impact of the survey on the local citizens.

Seismically Sensitive

Over the course of the program, Seismic Solutions acquired 11 miles of 2-D seismic data in 12 days.

"We had 200 ARUs here, with 150 to 180 deployed on any one line," Hollis said. "We had four lines, each about

two to four miles long, and all four lines were shot using a point source/point receiver methodology – the prospect included a total of 678 receiver points and 465 source points."

The four buried lines of ARUs were deployed along the sides of city streets with one line bisecting Long Beach Airport taxiways and runways, Rambaud noted. The lines were shot one after the other.

"At the end of the day, we had to pick up the ARUs quickly, download the data and QC it and redeploy the next morning so we didn't lose any time," Rambaud said.

The entire program was implemented using VibroSeis® technology. Because southern California is particularly sensitive to seismic disturbances, it was decided to reduce the output of the vibrators. To compensate for the lower output and regain the lost signal to noise ratio, the vibrators performed a series of 18 sweeps per vibrator point.

"Each sweep individually is very good in terms of noise trends and noise analysis," Camacho emphasized. "This is very important in this area."

Fairfield currently is processing the acquired data.

The program earned an A-plus rating even while acquisition was ongoing.

"On the Willow (street) line we saw a shallow bright spot near a well we were drilling, but it had not been tested by the well," Camacho said. "This bright spot anomaly basically will be a follow-up well on a different location."

Slater noted they refer to the just-completed 2-D project as their pilot phase project.

"The next phase will be 3-D acquisition over a portion of the field using the Fairfield system," he said. "Our ultimate objective with the seismic at Signal Hill is to get at the two billion barrels we think are still in place."

A 'Complex' Reservoir

Even with plenty of seismic, the midnight oil likely will be burning.

The LB/SH field sits along the Newport-Inglewood fault zone, which is the major fault system running through the Los Angeles Basin. The associated folding, faulting, thrusting, etc. create a highly complex geologic scene.

"We've done a lot of conventional analysis of this field through subsurface mapping," Slater said. "That has opened our eyes to how complex the reservoir is."

"In the standard mapping process, we've generated dozens of fault picks in well logs," he said, "but we can't connect the dots because there's not enough data to get the orientation as to where the faults are going."

"Understanding the faulting and compartmentalization is going to give us targets to drill where there's oil that hasn't been drained."

The LB/SH field currently produces principally from the Pliocene, and the productive section in the field is 10,000 feet thick. The largest sandstone within that 10,000 feet is perhaps 20 feet thick, according to Slater, who noted there are hundreds of interbedded sandstones and shales within the section.

"The average well depth is about 5,000 feet, and the deepest production now is about 10,000 feet," Slater said. "We haven't found the bottom of production yet."

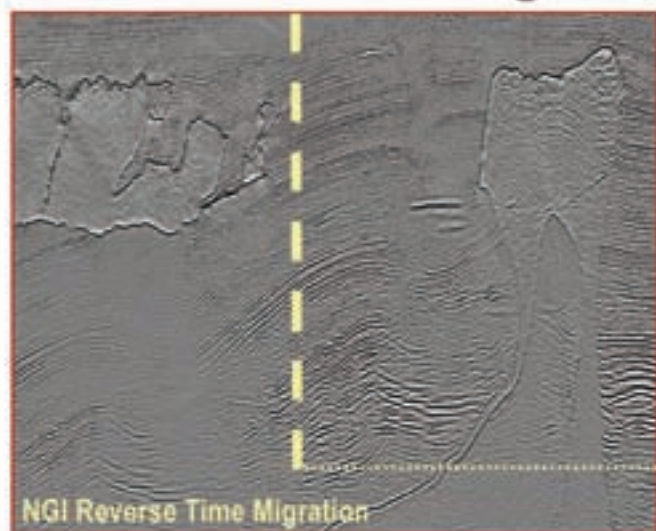
"Absent the seismic data, we've done everything we can to understand the very complex subsurface picture," Slater said. "That's why we're so motivated to pursue the 3-D data acquisition." □

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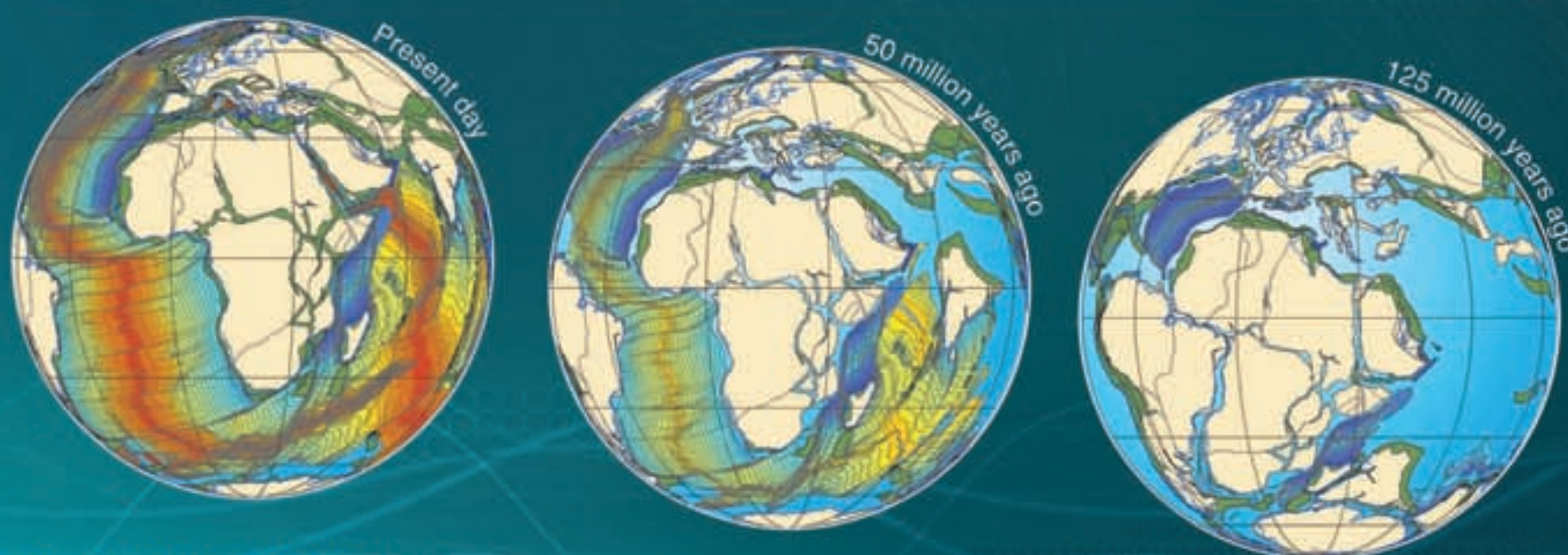


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From 'data holes' to polar bears

Not Much Is Easy in the Arctic

By DAVID BROWN
EXPLORER Correspondent

For seismic to unlock the potential of challenging exploration environments, we'll need some key ideas.

That's especially true in the Arctic, one of the most hostile settings on the planet.

There, a key concept known as turning ray tomography (TRT) is helping geophysicists deal with near-surface conditions that can include ice, permafrost, partial melt, running channels and gassy hydrate slush.

Seismic companies have learned to live with data acquisition in challenging situations.

"In fact, hardly any of them are easy," said Scott Cheadle, who served as head of research and development in the Calgary, Canada, division of CGGVeritas.

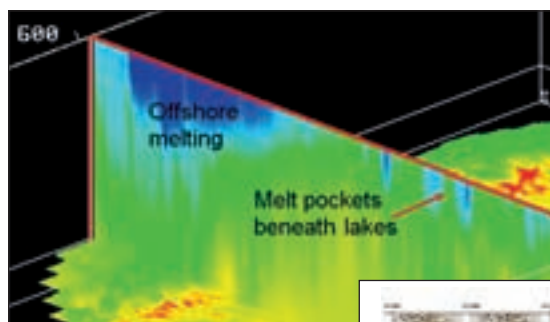
Cheadle is now a technical consultant for the company and lives outside of Thunder Bay, Ontario – "on a good piece of property in a beautiful part of the world," he said.

His experience with seismic acquired in the Arctic gives him a special perspective on the problems of hostile environments.

"It's certainly a new era in terms of doing any sort of exploration or seismic acquisition in the northern parts of the world," Cheadle noted.

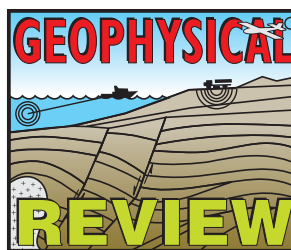
Problems range from temperatures that can drop below minus 50 degrees F, to a short seasonal window for survey work, to sensitive habitats and other environmental restrictions.

"For instance, you can't place seismic



Photo, graphics courtesy of CGGVeritas

The big chill: Carefully monitored operations, specialized equipment and intensive training help seismic crews minimize impact in the harsh but delicate Arctic environment.



sources anywhere you want," he said. "Some of these bodies of water are closely monitored. The wildlife is protected."

A Challenging Environment

Cheadle worked on seismic imaging software for use with data acquired in the Arctic. Geophysicists have learned that determining near-surface velocities are important for structural imaging of deeper strata and reservoir characterization.

"In terms of land seismic, the Arctic near surface is extremely challenging," he noted. "We rarely ever know enough about it."

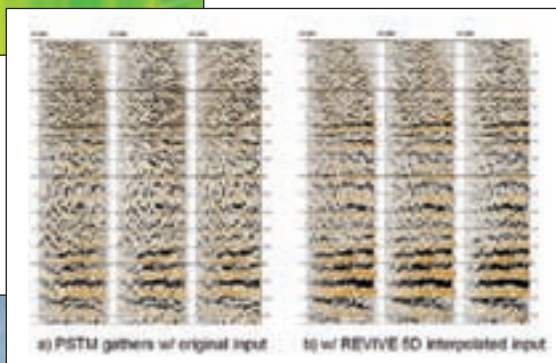
Traditional refraction analysis of the near-surface works best when simple layering of the shallow subsurface is present, apparent from the pattern of first arrivals on seismic records, Cheadle explained. Several different modes of seismic energy, including head waves, body waves following turning ray paths or noise may appear as a first arrival.

On any given dataset, some or all of these may be present.

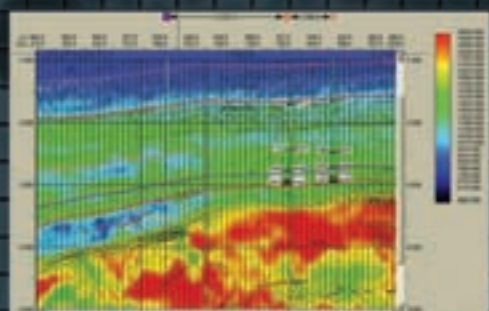
"If you have clear linear segments punctuated by a sharp change in angles of those first arrivals, you likely have a situation where you have layering," he said.

Analysis of the timing and slopes of the first arrivals indicate the velocity and thickness of the near-surface layers.

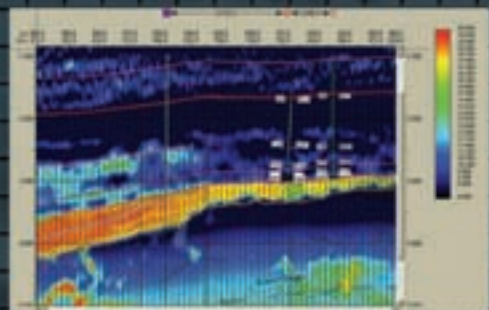
"If you have a more complicated near-



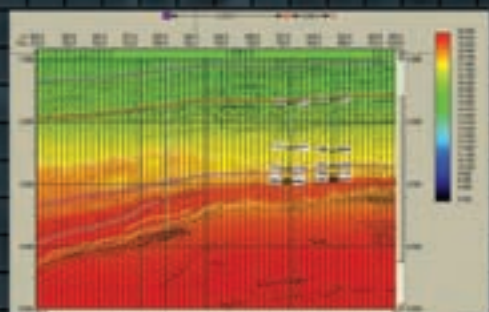
See [Arctic](#), page 16



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Arctic

from page 14

surface or if you have a velocity inversion, they look more arbitrarily curved," he noted.

"Permafrost is exactly the opposite to simple layering. It's extremely patchy. It's a high velocity material underlain by a low-velocity material, which is something seismic doesn't want to see," Cheadle added.

He compared some Arctic near-surface conditions to Swiss cheese due to localized melting, with varied states of material, mixed low- and high-velocity areas and unreliable, missing or compromised data.

"To make a model of the near surface, we assume we understand the nature of the first breaks," Cheadle said. "If all you have is a linear first break at ice velocity you essentially have a situation where any meaningful information about the near-surface is lost."

In working with Arctic seismic data, "it would not be unusual to spend weeks, literally man-months, picking the first breaks," he said.

Because of the challenges involved, seismic can almost never accurately identify the bottom of the permafrost layer, according to Cheadle.

TRT helped CGGVeritas characterize and better understand the nature of the Arctic near-subsurface.

"CGGVeritas routinely runs generalized linear inversion (GLI) refraction analysis and our turning-ray tomography on every project, and assess which solution works best on a case-by-case basis," Cheadle said.

Tomography is essentially imaging in sections or slices, using wave energy. TRT treats the near-surface media as a grid of small rectangles in which rays are

A Tasty Technical Theory

Mmmm ... Doughnuts!

Scientists have developed a theory about the way rays behave in seismic tomography.

This model describes behavior in the zone of influence for the ray between source and receiver, or in a Fresnel zone. The name comes from French physicist Augustin-Jean Fresnel (pronounced fray-NELL).

The tube of material surrounding the ray path is seen as the primary influence on ray velocity in Fresnel zones.

Seen in cross section, the tube surrounding the ray looks like a heavy O, or a doughnut.

The tube and ray themselves appear to be curved, not in a sharp curve but in an arc shaped more like a banana.

Some scientists know this as the Born-Fréchet Kernel Theory.

But most scientists, for obvious reasons, call it the Banana Doughnut Theory.

— DAVID BROWN

turned or continuously refracted.

"It looks at things as a more complex grid model," Cheadle said, "a requirement in areas affected by permafrost."

Like all seismic tomography, TRT uses somewhat different assumptions from standard seismic interpretation. That gives it an edge in imaging when refractors are not layered.

Geophysics has found that TRT's shallow velocity imaging can provide good short and long wavelength statics. And good long-wavelength statics can improve deep structural interpretations.

"We have peculiar ideas about seismic," Cheadle noted. "We want to have perfect resolution from right below the geophone down to the target of interest."

But imaging of exploration targets is the main point of a seismic survey, and TRT can help interpreters clear away the mist of the near-surface for a better view of the deep subsurface.

The Fifth Dimension

Environmental restrictions in the Arctic

often leave areas where data can't be collected.

Polar bear dens, sensitive natural features, lake areas and many other places are out-of-bounds to seismic crews.

"We're always working with compromised data," Cheadle said. "The bigger the holes – the more of these exclusions there are – the bigger the challenges."

To address the problems of incomplete data acquisition and undersampling, CGGVeritas developed its "Revive 5D" interpolation approach, "to infill sampling gaps and increase spatial sampling while preserving original recorded data."

This method performs simultaneous prestack interpolation in five dimensions – inline, crossline, offset, azimuth and frequency – to predict new sources and receivers at desired points.

According to the company, the interpolator algorithm is based on Fourier reconstruction.

Interpolation is posed as an inverse

problem where the model is a super-sampled seismic data set that contains the desired target geometry. A sampling operator maps the model to the acquired data.

Interestingly, all five dimensions are considered simultaneously in Fourier space. That enables the interpolation method to incorporate amplitude variations due to both structure and stratigraphy.

"The advent of good interpolation is a happy marriage" between gaps in known data and today's massive processing capabilities, Cheadle said.

Geology also can assist the geophysicist in characterizing the near-subsurface. The more facts available, the better.

"There's virtually no place in the Arctic where it isn't helpful to have some shallow logging," Cheadle noted.

CGGVeritas has worked in the Arctic since 2001. Like other seismic companies, it's learned to work within the restrictions of a challenging, environmentally sensitive area.

"We generally have to work pretty quickly. Every aspect of working in the Arctic is highly monitored. It's not necessarily restrictive in the technical sense, but it is tightly controlled," Cheadle said.

Because of the sensitive nature of the setting – seismic crews receive top-notch training in minimizing impact, from carefully planned and monitored operational procedures to utilizing specialized equipment.

Crews also come up against the challenges of working in an area that is remote, dehydrating, difficult, demanding and often dangerous.

Not to mention, really cold.

"Things don't always work at 30 below," Cheadle said. "They break a lot." ■



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NAPE struts new technology, too**From Old Stripper to Power Producer**

By LOUISE S. DURHAM
EXPLORER Correspondent

How very appropriate that Houston is home to Summer NAPE.

The enormous demand for air-conditioning required to make life bearable in this Gulf Coast city's environment of excessive summer heat and humidity is apt testimony to the nation's need for dependable energy sources – particularly time-proven, efficient oil and natural gas.

Summer NAPE is the annual prospect and property exhibition, offered by AAPG and the American Association of



Summer NAPE crowds gathered to see the Linear Driver Free-Piston engine.

Professional Landmen – a companion to the NAPE event held earlier in the year. Both events have become “must attend” events for geologists, geoscientists and investors.

The delightfully chilled George R. Brown Convention Center enabled the recent NAPE viewers to roam in comfort as they perused the expected smorgasbord of oil and gas drilling prospects.

Of course, they also came across vendor booths where the unexpected was on display.

Included among the surprise

encounters this year was Long Beach, Mississippi-based Linear Power Ltd., which was displaying the Linear Driver Free-Piston Engine it developed to turn watered-out wells into long-life electrical power producers.

“Natural gas wells that produce gas, or geo-pressured brine/gas wells that produce mainly high pressure brine, or low pressure gas wells with a high water cut are all wells capable of generating kinetic energy,” said Bob Hunt, founder and chief technology officer at Linear Power. “This energy in turn is able to produce valuable amounts of electricity.

“A highly productive well is capable of producing several megawatts of electricity per hour,” Hunt said. “A megawatt (MW) per hour of electricity will sell in a range of \$75 to \$120 per hour, resulting in revenues of up to \$86,000 per month.

“The economics of individual well locations will vary depending on selling price and other factors,” he emphasized.

The electricity produced can either be used on site or sold into a local electrical distribution grid.

“Our application is attractive to oil and gas producers who spend significant amounts of money on electricity for production purposes,” Hunt noted.

Step by Step

Linear Power has performed short-term testing of its equipment on wells in the field, and it has purchased five wells in Mississippi's Hancock County that are candidates for the technology. The wells are conveniently sited 12 miles from Linear's manufacturing facility.

At the time of this purchase, central Louisiana-based Cleco Corp. got wind of Linear's technology and contacted Hunt upon a recommendation from SMU. Via a relationship created by Cleco, Linear entered into an arrangement with ICON Environmental Services involving five high-pressured wells owned by ICON in Port Allen, La.

When Linear applied for a \$7 million grant from the DOE – which required at least five wells – it ended up with 10 in the package.

The company is planning its first commercial project on the Port Allen wells.

“The wells are 12,000 feet deep, 300 degrees and have 7,000 psi, so they're highly overpressured,” Hunt said.

“These are stripper wells with a lot of very high pressure hot water,” he noted. “We'll be able to produce both kinetic energy from the pressure and thermal energy from the heat, so we have two renewable energy sources within the wells and enhanced oil and gas coproduction via continuous gas-lift of the wells.

“We should be able to produce 10 megawatts of electrical power per well,” Hunt predicted, “and 50 megawatts is a very sizeable power plant. At only 10 megawatts, you're getting into the half million dollar per month range.”

The site is a mere half-mile from a substation, and Linear is completing an agreement with Cleco to take the power.

Hunt anticipates the project will be fully functional during 2010, with parts of it in play perhaps this year.



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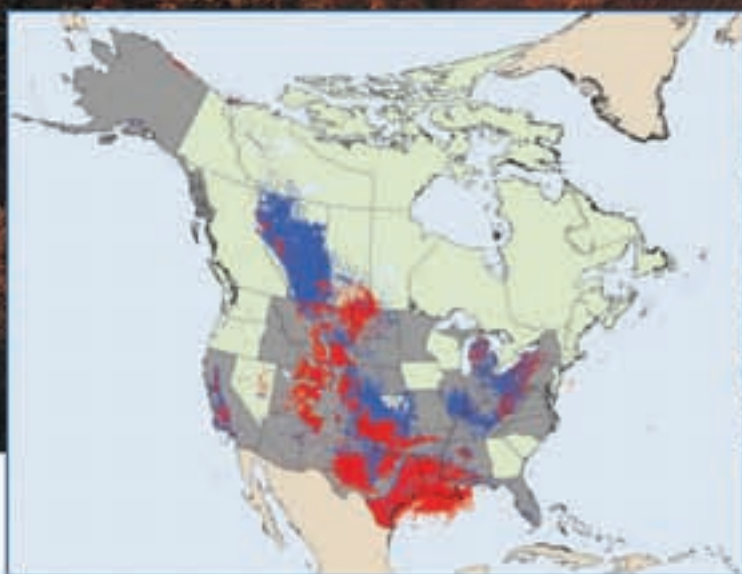
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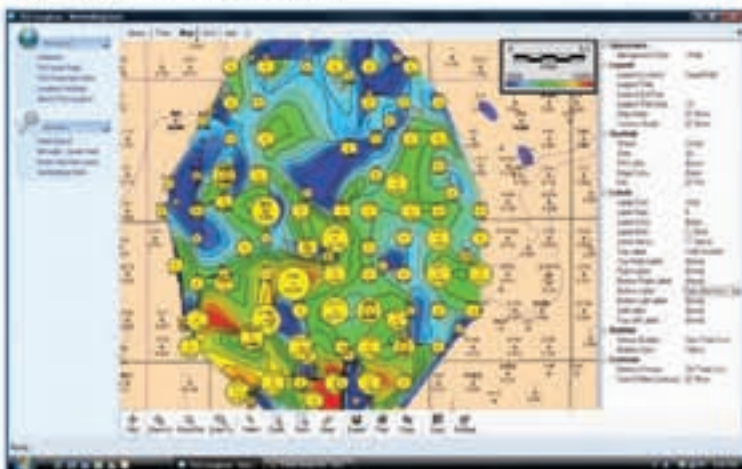


See **New Life**, page 30

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A capital idea!

Is It Time for a 'New Venture?'

By DAVID BROWN
EXPLORER Correspondent

Why start your own oil or gas company right now?

Cameron O. Smith, who's in the business of financing start-ups, has two words of classic advice:

"Buy low."

Smith is head of The Rodman Energy Group and senior managing director of Rodman and Renshaw LLC, a publicly listed investment bank in New York City.

This month he and AAPG member Bob Von Rhee, manager of KVR Energy LLC in Tulsa, will be co-chairs for "Starting Your Own Oil and Gas Company: Dream, Dare, Do!" a session set for the Mid-Continent Section meeting in Tulsa.

Think that starting a company is mostly a matter of struggling to get funding?

Wrong, Smith said.

"The goal of this session is to make sure that people know the opportunity to start a company is a matter of volition and ambition," he said.

And buying low – or getting into business during a down-cycle in oil and gas prices – looks like a wise move.

Von Rhee said he has been involved in three firms funded by venture capital: Tidewest Oil Co., Sapient Energy and as a founding partner in Rockford Energy Partners. He was a partner in Rockford Energy, which the management exited in 2004.

As you will discover, in venture capital "exited" is a word meaning "cashed in."

New ventures benefit not only from technical development of producing properties, but also any increase in oil



Smith



Von Rhee

and gas prices, Von Rhee noted.

"The price gain can lift many a bad acquisition," he said, "and make you look good."

Let's Make a Deal

Venture capital investment in the oil and gas industry isn't anything new, and a sizeable number of start-up companies have benefited from it.

Smith started arranging funding for oil and gas ventures at COSCO Capital Management, acquired by Rodman and Renshaw in 2008.

"We at Rodman Energy and earlier COSCO have arranged 50 financings for something like 40 companies in the past 17 years," he said. "Fully three-quarters of those were start-ups."

But what about now, with lots of talk about recession and problems in the capital markets?

"Sure, it's a good time to be in the business," Smith said. "The great thing about periods like now is that there are deals to be done."

Von Rhee also sees opportunities for building a business today.

"From the professional geologist's point of view, we've come through an extraordinary pricing environment in the past two years," he said.

"My partner and I are seeing what we

thought we'd see," he added. "People who came into the business at very high commodity prices are having trouble, going into bankruptcy, etc."

At the same time, Von Rhee noted, buyers and sellers seem to be "decoupled" in negotiating sales prices for properties.

Sellers "haven't had what we might call market therapy," he continued. "They aren't going to get what they thought they were going to get nine months ago."

Risk Averse?

New-venture financing might be available now, but that's not to say the process of getting start-up funding is an easy one.

"It's a particularly difficult time to arrange that kind of capital," Smith said. "That's my downside."

"Managers are concerned about existing problems in their own portfolios," he added. "They are reticent about investing in what could be a falling market."

Von Rhee has been through the venture-capital funding process and described it as challenging: "There's quite a bit of lawyering that goes on," with complex legal and financial documents, he observed.

"It's a business venture, and it can't be treated lightly," he added. "I would rate it as a serious, possibly difficult process, that needs to be a business and financial focus."

See **Financing**, page 24

'Dream, Dare, Do!'

A session on how to get funding for new ventures, "Starting Your Own Oil and Gas Company: Dream, Dare, Do!" will be offered Tuesday, Oct. 13, during the AAPG Mid-Continent Section meeting in Tulsa.

The session co-chairs are Cameron O. Smith, head of The Rodman Energy Group and senior managing director of Rodman and Renshaw LLC, a publicly listed investment bank in New York City; and AAPG member Bob Von Rhee,

manager of KVR Energy LLC in Tulsa.

Scheduled panelists are:

□ **Randy Foutch**, chairman and CEO, Laredo Petroleum Inc.

□ **Jim Hughes**, president and CEO, SunTerra Oil & Gas.

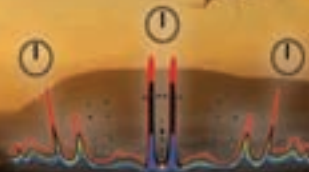
□ **Maurice Storm**, president and CEO, Crow Creek Energy II LLC.

For more information go to the Mid-Continent's Web site at www.2009aapgmidcon.com/techprogramdetails.htm

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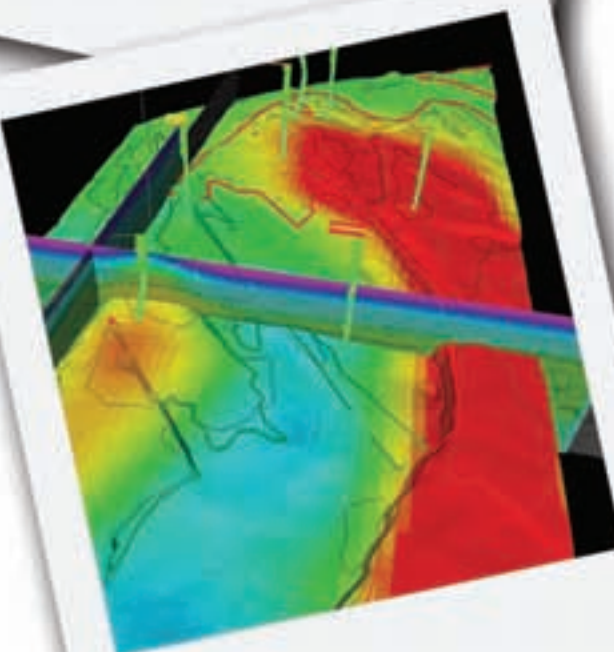
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Structure
World

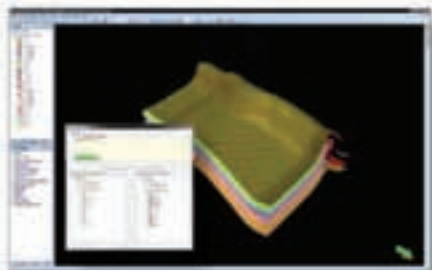
This month's column highlights one of the workflows shown at our 2009 Technology Meeting, 'Structural Geology for Uncertain Times' which took place in Glasgow (UK) last month (after we went to press). We will tell you all about it in next month's column but if you can't wait until then visit our website, www.mve.com. Also covered this week is our Move2010 software release and our attendance at AAPG ICE in Rio, both happening in November.

2009 Technology Meeting Highlight: Using the MovePetrel* link to update a model based on real-time drilling information

The new MovePetrel Link is a native Petrel module that allows direct transfer of data between Move, our structural modelling and analysis software, and Schlumberger's* Petrel. Models created in Petrel can be transferred to Move for restoration, validation, balancing and/or editing using geological constraints.

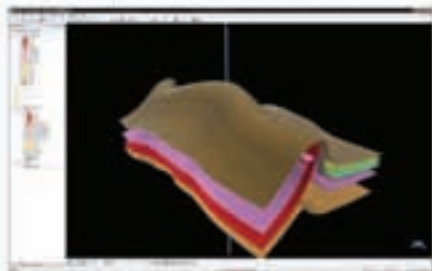
Here we will show how a model can be updated in Move with structural integrity based on new well data with the ability to structurally validate post-edit. This is a real example in which Move was used to update the model iteratively from well data obtained whilst drilling.

The MovePetrel Link window allows objects chosen in Petrel to be transferred to Move. The objects we have selected are shown in the right-hand side of the window. Upon pressing 'Transfer Selected Objects', Move opens and the objects are transferred without the need for the traditional time demanding import/export route.



Model in Petrel about to be transferred to Move. The MovePetrel link window is inset.

During drilling the key bed is encountered in the well at a higher elevation than in the original interpretation. In Move the Reshape tool is used to reshape the surface in 3 dimensions to match the new well pick. The surfaces below this horizon are also reshaped based on the new geometry. If required, a 2D slice through the updated 3D model can be restored and validated before being easily sent back to Petrel.



Petrel model within 4D Move for real-time editing.



For further information contact us: +44 (0)141 332 2681 or email help@mve.com.

www.mve.com

The structural geology experts

The MovePetrel Link window is dynamic and automatically knows when an object has been reshaped or moved in Move. The reshaped surfaces are transferred back to Petrel by pressing the 'Update from Move' button. These surfaces appear in the Petrel Tree as new objects and allow the user to compare them to the originals and decide what course of action to take.

Note: The MovePetrel link is available in Move2009.2 and the soon to be released Move2010. Petrel 2008.1.0 (or later) is required. For further information or an evaluation of the MovePetrel link please contact help@mve.com.

Move2010 Release November 2009

Since moving the 2D Move, 3D Move, 4D Move and MoveViewer components into the one product our developers have been working towards complete cross-component and user interface integration and Move2010 brings us one step closer to the complete structural modelling and analysis toolkit.



Move2010 is scheduled for release to our maintained clients in November of this year. So what will be the main features of Move2010?

- The MovePetrel link;
- Improvements in the cross-component (2D/3D/4D Move) user interface and workflows especially for structural modelling and decompaction;
- New forward modelling algorithms in 2D Move;
- Improved 2D Move model building;
- Shapefile and Eclipse Export in 4D Move.

If you would like an evaluation of Move contact Sarah, sales@mve.com.

Come and See us at AAPG ICE in Rio...

We are exhibiting and presenting at the AAPG ICE in Rio De Janeiro along with our Upstream Technology Alliance partner Badley Geoscience.

Come and visit us on booth # 102 for a software demonstration of Move2010, including the MovePetrel link, or to discuss what we can do for your structural needs.

If you would like to set aside some time with us during the exhibition please email Sarah, events@mve.com.

Governance change studied C&BL Endorses Present System

By LARRY NATION

AAPG Communications Director

After a study of a Global Corporate Structure proposal, no change to AAPG's present governance and legal structure is recommended, according to a report by the House of Delegate's Constitution & Bylaws Committee (C&BLC).

"The current governance structure of the Association is well positioned for the advancement of globalization," the C&BLC said. John Hogg, Calgary, is chairman.

The recommendation was aired at a Leadership Days gathering of over 140 persons meeting in Tulsa in late August, and was forwarded to the Executive Committee by HoD Chairman Steve Sonnenberg.

The Global Corporate Structure proposal considered by the C&BLC was an outgrowth of the Strategic Plan adopted in 2004, and was studied by two separate committees and discussed by the HoD and Advisory Council at the AAPG Annual Convention and Exhibition in Denver.

The plan also was publicized in the EXPLORER and via an extensive Web presence that was created for all members to study and comment on the plan. Scant comments were posted.

The C&BLC reviewed over two months the recommendations brought forward by the 2008-09 Global Corporate Structure Committee, chaired by Marty Hewitt, then of Calgary, now of Plano, Texas, which included findings, suggestions and input from a previous committee chaired by past president Marlan Downey.

The plan considered by the C&BLC suggested a three-step process that involved a restructuring of the Association's legal and governance structure, with the goal to enable AAPG to operate worldwide while safeguarding the Association's assets.

The C&BLC also recommended:

✓ The Sections, Regions and headquarters conduct a Summit to improve communication, cooperation and to advance globalization throughout the Association.

✓ The Advisory Council continue its annual review of the Long Range Plan as called for in the Bylaws.

The C&BLC comprises two members of the Canada Region (Hogg and Hewitt); two members of the Gulf Coast Section (Paul Hoffman and Clint Moore); one member each from the Asia-Pacific Region (Peter Lloyd), the Pacific Section (Don Clarke) and the Mid-Continent Section (Jim McGhay).

A statement by the committee said the deliberations "aired many different viewpoints on the various issues discussed. But the group was completely unified in its determination to seek the most effective ways to advance the globalization of AAPG."

The C&BLC addressed the three-step proposal individually:

✓ The first step advanced by the GCS Committee involved the formation of incorporated offices within the International Regions of AAPG.

"AAPG is already moving forward with plans to open offices in most International

AAPG Remains Committed to Future Global Development

By JOHN C. LORENZ

AAPG President

and

RICK FRITZ

AAPG Executive Director

As reported in the accompanying story, in-depth discussions within the Constitution and Bylaws Committee of the House of Delegates recently concluded that significant bylaws changes are not needed in order for AAPG to continue to globalize. The purposes of globalization for AAPG are to collect and disseminate petroleum geoscience, to offer a more relevant but convenient membership to geologists worldwide, to provide easier access to AAPG services and products, and to provide a liability shield for AAPG assets. The oil and gas industry already is global, and as long as it is done without damaging the strong existing base of affiliated societies and volunteers it makes sense to continue globalizing the scientific organization that serves

See Global, page 24

Regions, and the C&BLC supports this step and does not see the need for bylaws changes with regards to international growth through the international offices," the committee said.

✓ The second step proposed by the GCS Committee was to develop a holding company under which the Region offices will be placed as part of the overall AAPG corporation.

"Our discussions with AAPG staff and with legal counsel regarding the issue of liability and tort protection led us to conclude unanimously that the existing legal structure, as described in step one, is sufficient to protect the programs, staff (volunteer and paid) and financial assets of AAPG," according to the report. "We therefore do not recommend the formation of a holding company at this time. We do recommend monitoring with legal counsel."

✓ The third step proposed by the GCS Committee was the formation of a U.S. Region and inclusion of the Sections within the Region.

"The C&BLC undertook an extensive review of all aspects of AAPG governance structure, which included the EC, AC, Divisions and HoD current structures and what a potential future state could look like, and in the end determined that the diversity and flexibility of our existing governance structure will facilitate globalization," the committee said.

Hogg wrote on behalf of the committee that "AAPG is rapidly becoming a global Association and we, the C&BLC, see great opportunity to achieve this strategic goal, within the framework of the current corporate, legal and governance structure of the AAPG." □



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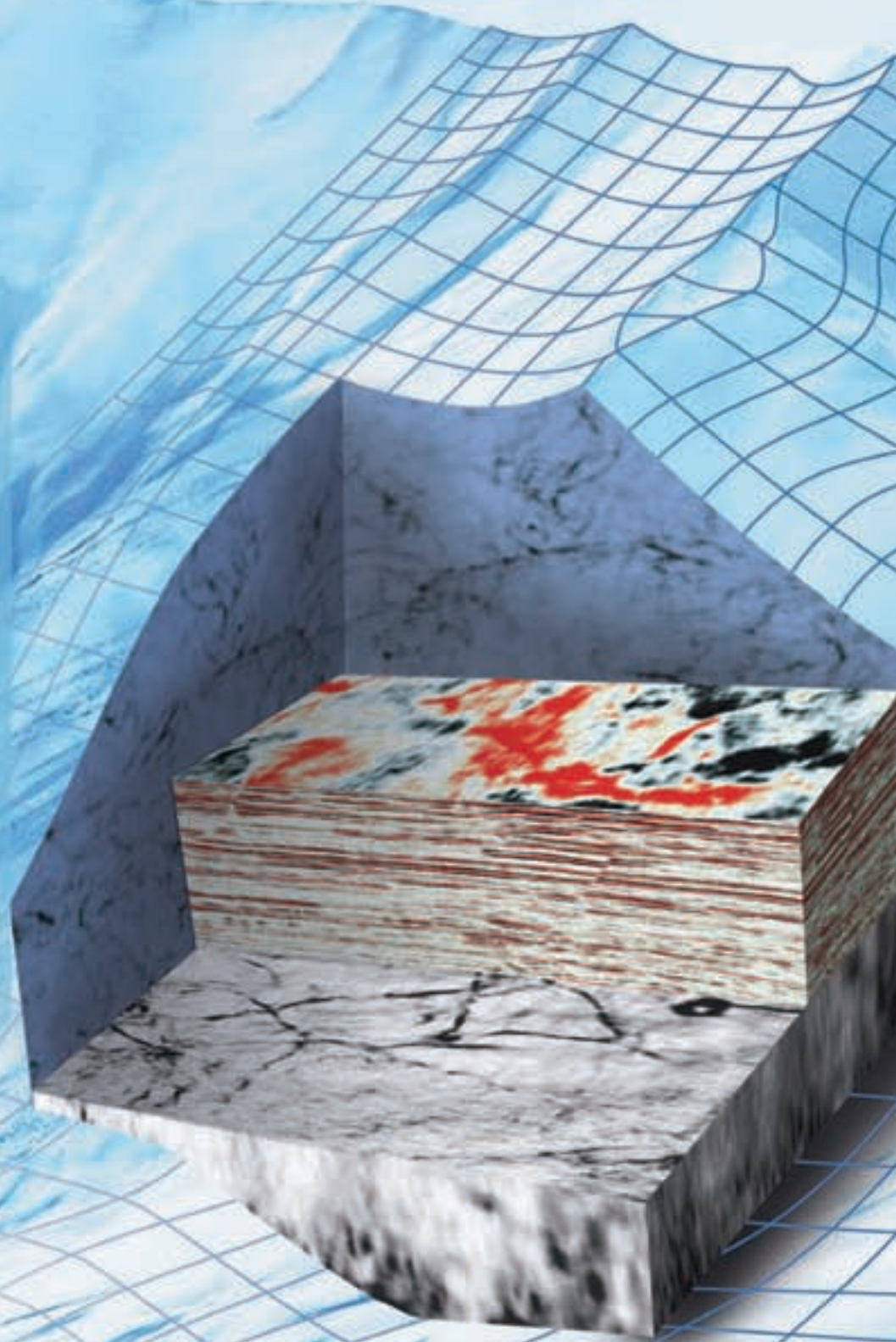
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Financing

from page 20

"But it's not an impossible process," he added.

And money is there. Rodman Energy's latest survey shows capital availability isn't an issue, said Smith.

At June 30, its Private Capital Energy Index of 20 providers reported having just under \$30 billion to invest in energy companies or projects. According to the National Venture Capital Association, U.S. venture capitalists invested \$6.9 billion in deals during the first half of 2009.

The Mid-Continent's session on start-ups also will feature a panel presentation and discussion with leaders of oil and gas companies who have built successful businesses through venture-capital funding.

"All of these individuals (panelists), including Cameron and me, are geologists," Von Rhee said. "That's what's really interesting."

Venture capitalists primarily look for experience and a successful record in a start-up management team, plus solid grounding for the new company, he said.

"The geologists and other individuals involved in this very typically bring assets to the table when they look for funding and invest their own money alongside the new capital," he noted.

In his experience, this results in the company founders starting with a relatively small equity position in the new venture and ending up with 20-30 percent of the profits upon exit.

Some companies are sold to larger entities and have an ongoing existence.

But for the most part, venture-capital-funded oil and gas start-ups will have a closed life-cycle, Von Rhee said.

"There's a point at which the original

equity partners are looking to cash out and go on to other things. For the management, that's also a cash-out point," he explained.

The Business Side of Geology

It might sound odd, but the situation in the industry today involves money looking for solid and promising start-ups to fund, more than geoscientists looking for new-venture capital.

Part of the reason is that this price cycle has seen fewer layoffs, with fewer experienced managers wanting to start their own businesses.

"The typical source of start-up managements is coming out of mergers and acquisitions, something like that. That, too, has been at a low ebb for the past 12 months," Smith noted.

And part of the reason is that so few geoscientists understand the venture capital process.

"Most geologists are unaware how to approach venture capitalists," Von Rhee said.

"The geologist has always been the explorer, the idea person, but has never been coupled with capital. It's been a classic problem within our industry," he added.

So the "Dream, Dare, Do!" session hopes to provide good information to aspiring new-venture owners, even offering a "Dummies' Guide to Private Capital Financing" discussion.

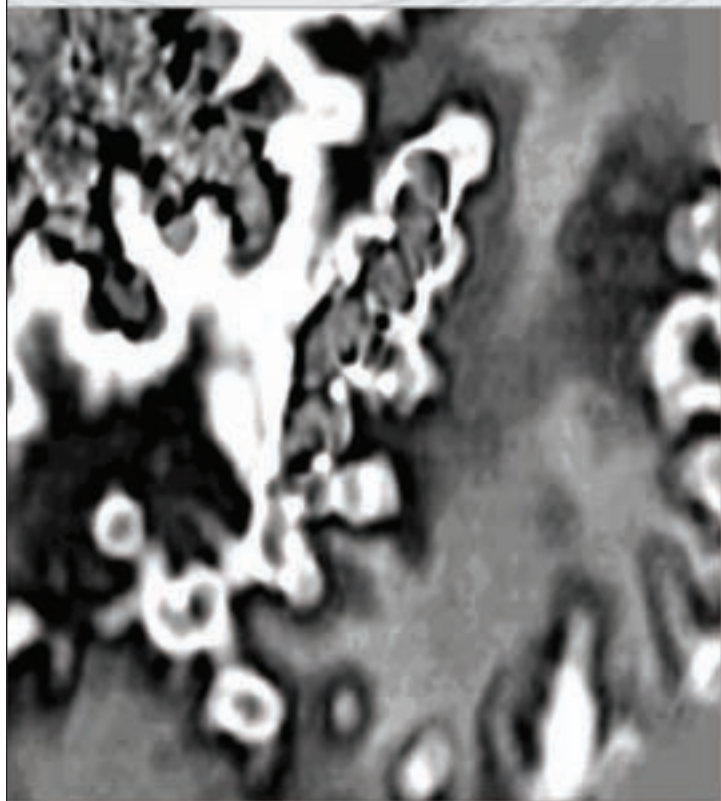
"Geologists love what they do, they really love their profession. As a consequence, they don't get involved in the corporate finance side of the business," Smith said.

That shouldn't stop any geologist with desire and drive from seeking out capital for a start-up venture, he observed.

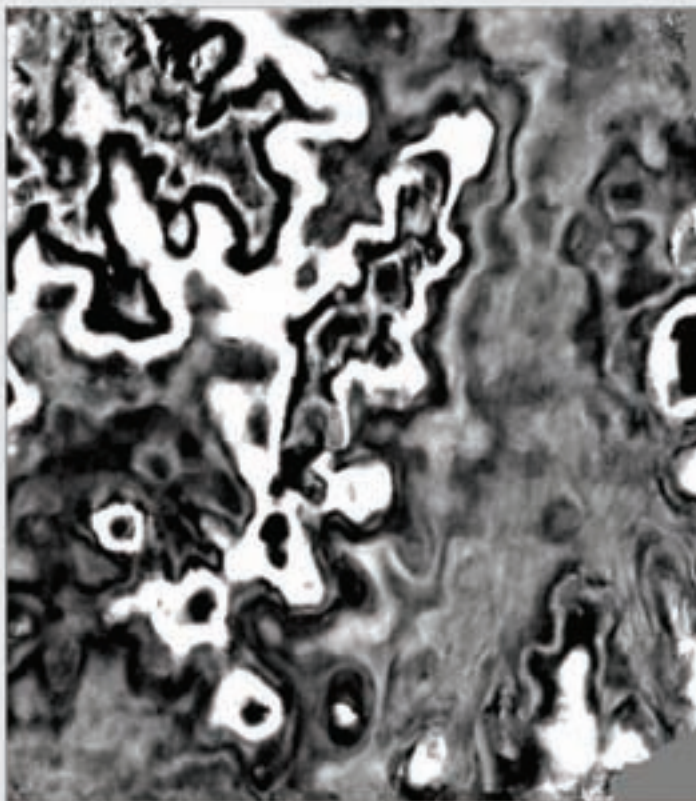
"Lots of people have done it," he said, "and lots of people have done it with great success." □

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Global

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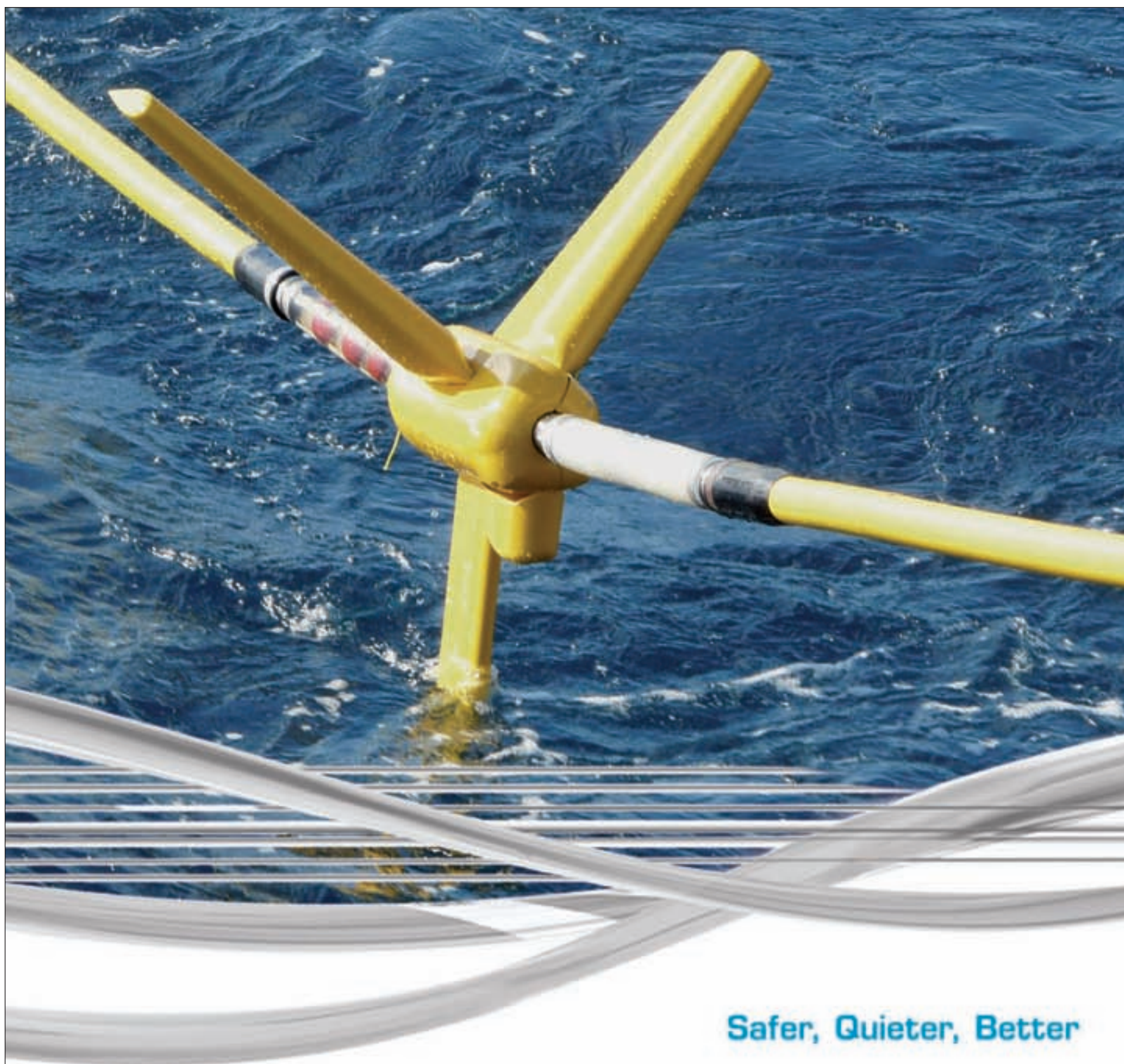
those who work in that industry.

No process of growth is linear, because perspectives change and the milieu we swim in is fluid. AAPG headquarters staff, two ad hoc committees and a standing HoD committee have spent considerable time looking at various models for globalization, and have made different recommendations at different times. Given the recent conclusions of the C&BL committee, it appears there are fewer barriers to globalization than originally thought.

The way forward will take several forms. We will continue to build offices in AAPG Regions when and where it makes sense to do so and as there is a demand for them. These offices will be developed deliberately, with regular assessments of their financial and political health, and with legal counsel. We will monitor operations to make sure the Region members and local affiliated societies are benefiting from the presence of regional offices, and that the offices are economically solvent. Interactions with the AAPG Regions will be formalized with memoranda of understanding plus procedures and processes developed with strong input from the Regions, making it clear on both sides what is expected and what can and can't be done in the day-to-day business of running AAPG. Similar memoranda eventually will be developed to clarify the interactions between AAPG and the AAPG Sections. And in another four or five years we can look again to see if the present governance structure is still adequate for the larger global association.

During this process, the AAPG Sections will gain by belonging to an organization with a larger, stronger membership. Scientific and business ideas developed in the Regions will more easily filter back to cross-pollinate with ideas developed in the Sections. AAPG's stature as a scientific organization will grow with global scientific representation.

But first, let us do no harm: We must encourage global development without discouraging the strong existing system. During the coming year, members of the HQ staff and the EC will be visiting the meetings of some of the affiliated societies, re-establishing the strong bonds that have made AAPG the source of pride that it is. □



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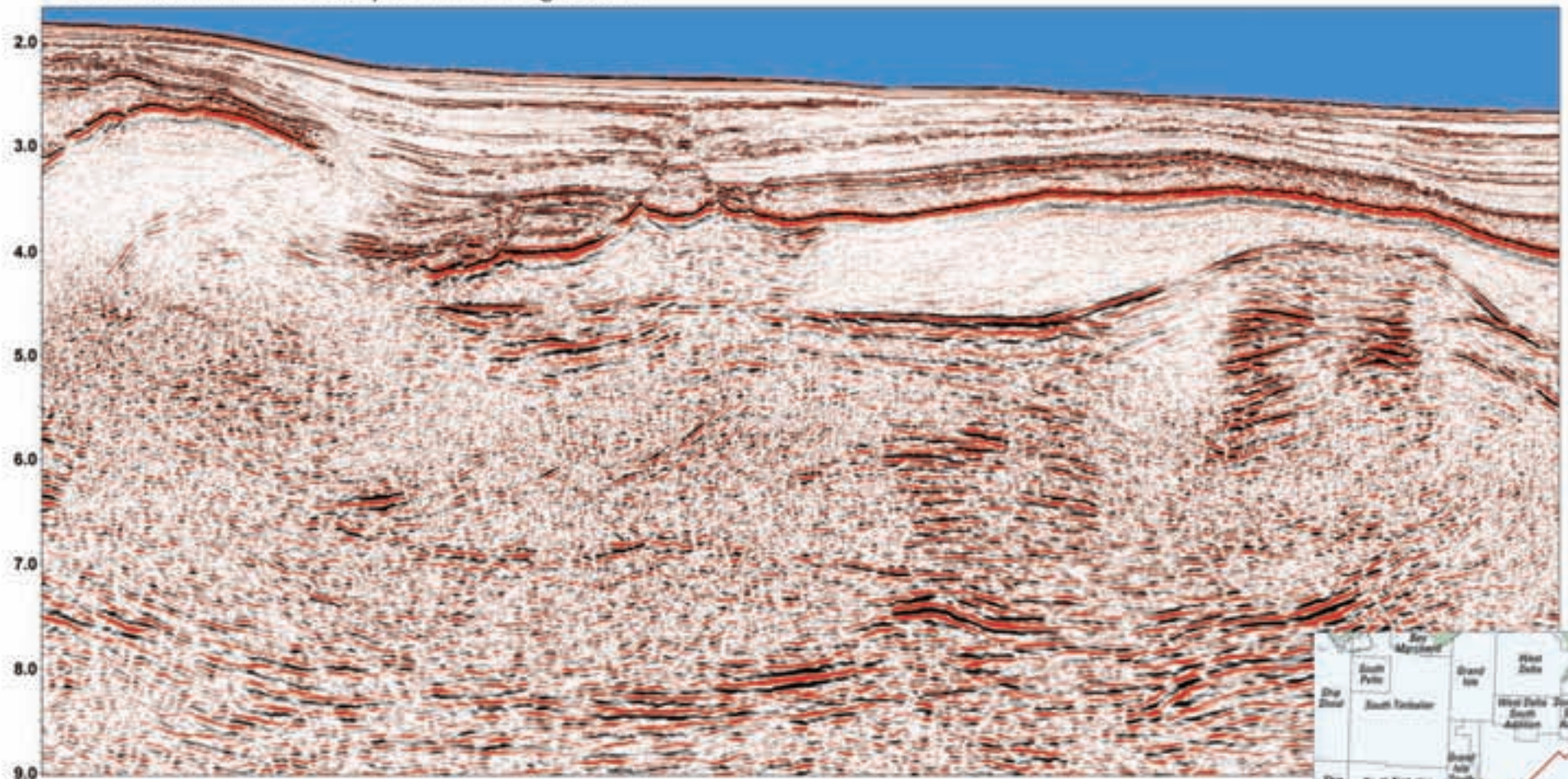


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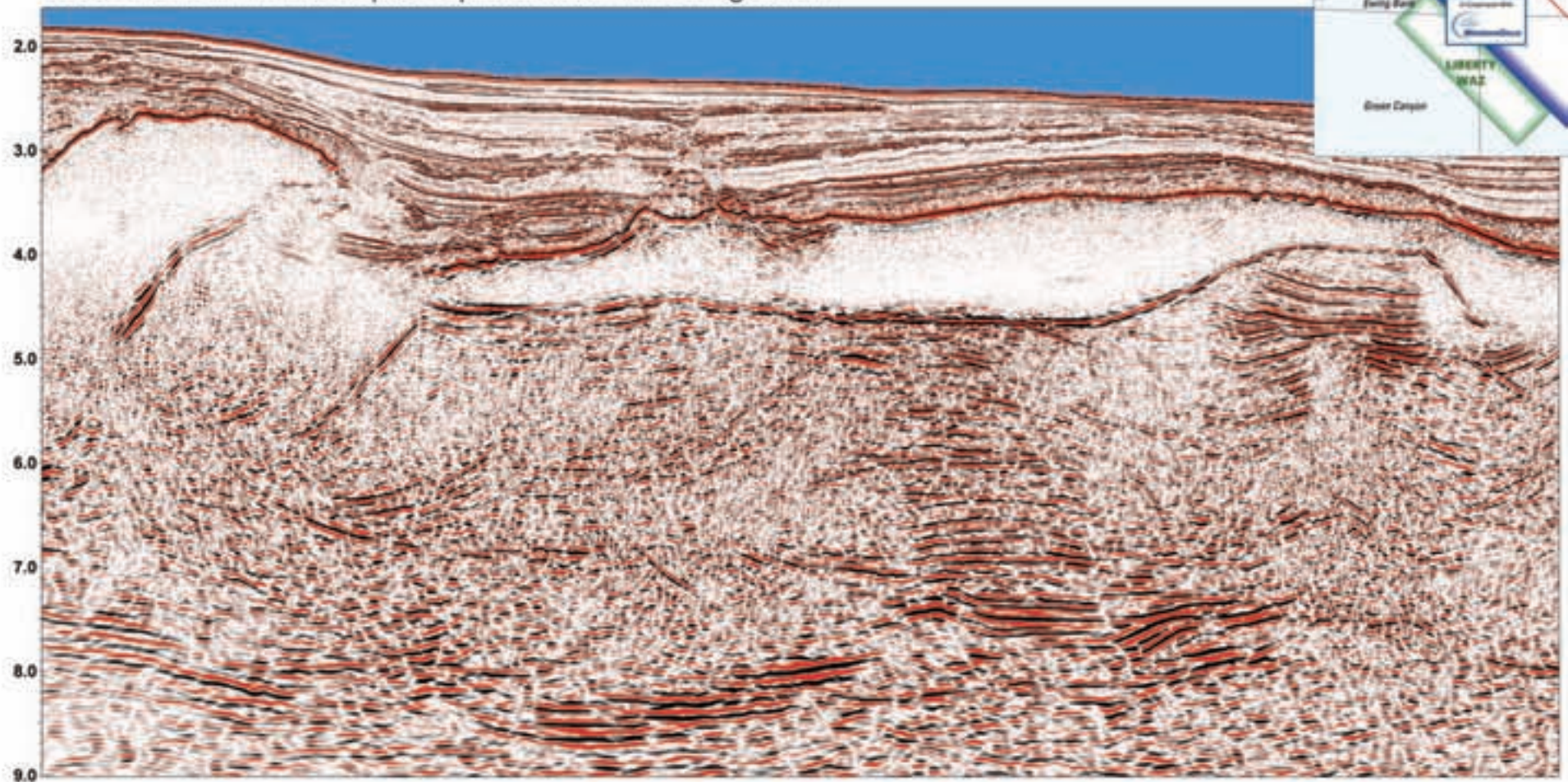
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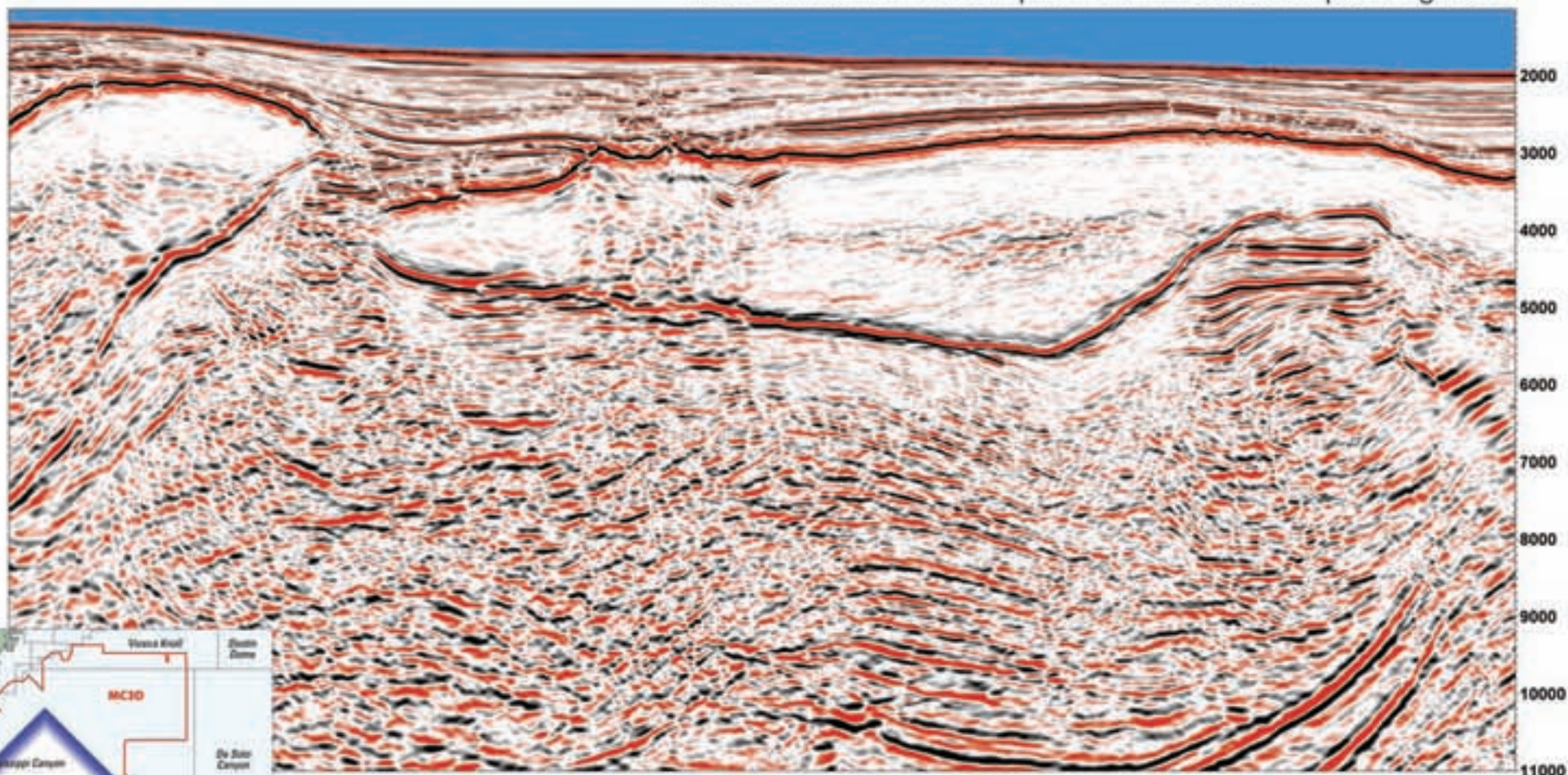
2000 MC3D NAZ Isotropic Time Migration



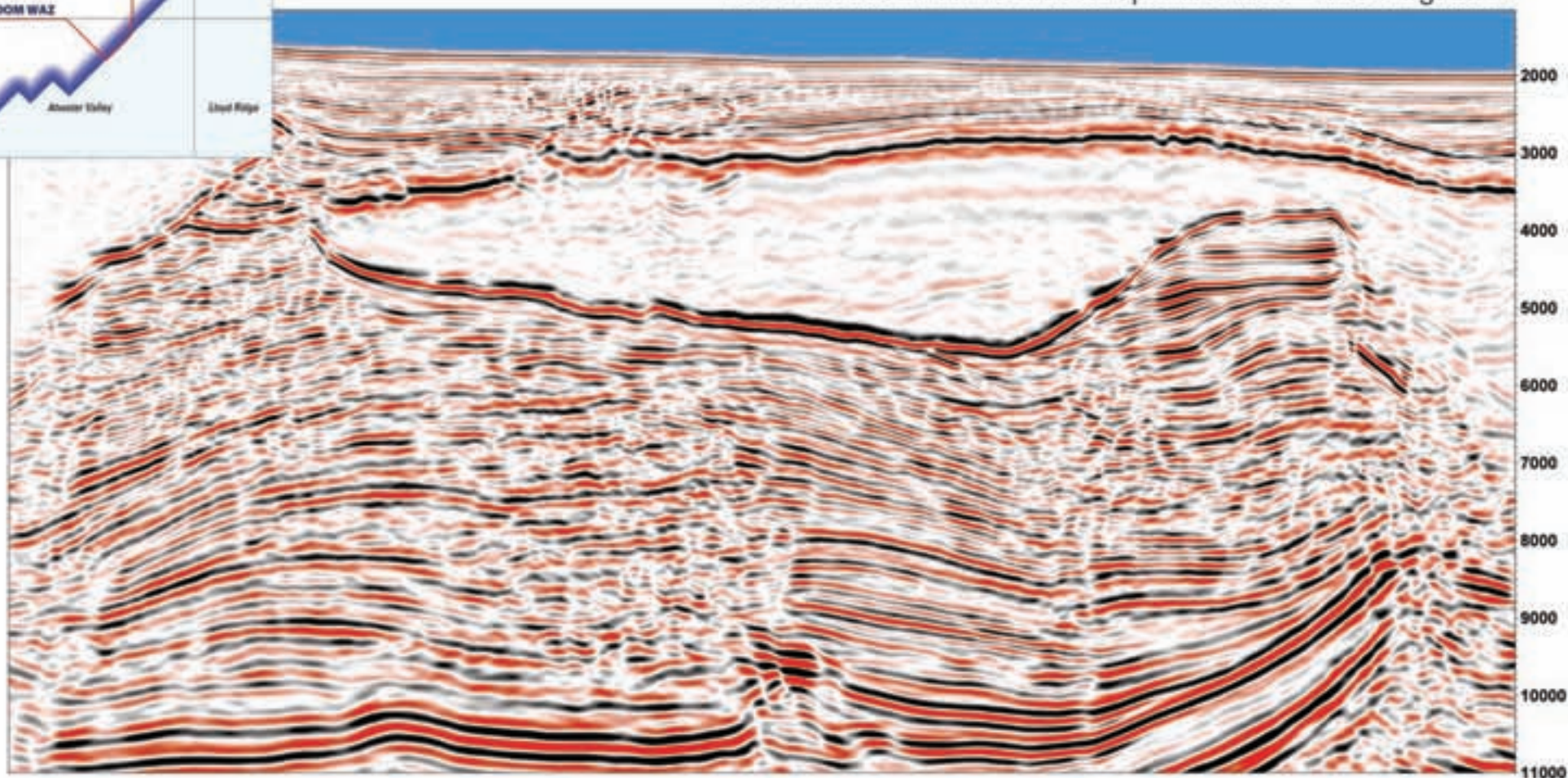
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SPOTLIGHT on...

Member was consultant on TV special

'Gallon' Follows Petrol Journey

By BARRY FRIEDMAN
EXPLORER Correspondent

In a song about the often misplaced emphasis on the journeys we take, Harry Chapin once sang, "It's got to be the going, not the getting there that's good."

In an upcoming National Geographic TV special, the magazine explores both the trip and ultimate destination of something that is at once so simple and yet so complex, and at times so controversial – a gallon of gas.

AAPG member Don Clarke, who acted as a consultant for the special (called "Gallon of Gas," it premiered on the National Geographic Channel in late September), says this report is part of a larger effort by the magazine.

"The show is planned to be the first of a new National Geographic series (tentatively) titled 'Engineering Journeys,'" Clarke said. "The plan for the series is to have each episode follow how something is made from natural resources to the consumer."

Specifically, in the case of "Gallon of Gas," it will be the story of oil – from its creation millions of years ago, according to program publicity, through the "prehistoric plankton, the transformation in the pressure cooker of time" and finally to "the raw stuff which fuels the modern world."

In a sense, oil is the anthropomorphic star of the series – the elusive prize, the grail – as the show reveals its travels



Clarke

"I feel that education is strength. The more the public knows about geology and the oil industry the better."

and travails.

Clarke is quick to point out that this is not a polemic.

"National Geographic's plan was to provide an engineering look at the process and not make a political statement," he said.

Saying the magazine was interested in both objectivity and the future of energy, Clarke emphasized the producers enlisted as many sides of the story as they could.

"They used other people from different backgrounds for other portions of the show," he explained.

Voice of Experience

The 'Gallon' connection began with a phone call to AAPG Communications Director Larry Nation about two years ago from an independent television producer wanting information and contacts for the program concept.

During the conversation the California-based producer was pointed to Clarke as a resource.

Clarke is no stranger to either the "engineering" or the politics of the industry – and, having worked in California for his entire career, he's familiar with public perceptions.

He started his career in the 1970s with the California State Lands Commission, where he rose to become senior geologist and got his first taste of misconceptions of his profession and industry.

From 1981-2004 he rose through the ranks of the Department of Oil Properties for the City of Long Beach – including responsibilities for the city's environmentally and esthetically friendly offshore THUMS drilling operation – and he frequently dealt as a liaison linking the industry, citizens, critics and proponents over matters large and small.

He knows both sides of the tension that surrounds oil exploration – and he believes the show sheds some necessary light into this often misunderstood dynamic.

"I feel that education is strength," he said. "The more the public knows about geology and the oil industry the better."

He believes part of the industry's problem has been the public's ignorance as to what it thinks of those in the field.

"People fear what they don't know – there have been problems with our industry in the past," he concedes, "but there have also been problems with just about any big industry in the past. I feel that an understanding of how the oil industry works and the risks will help calm those fears."

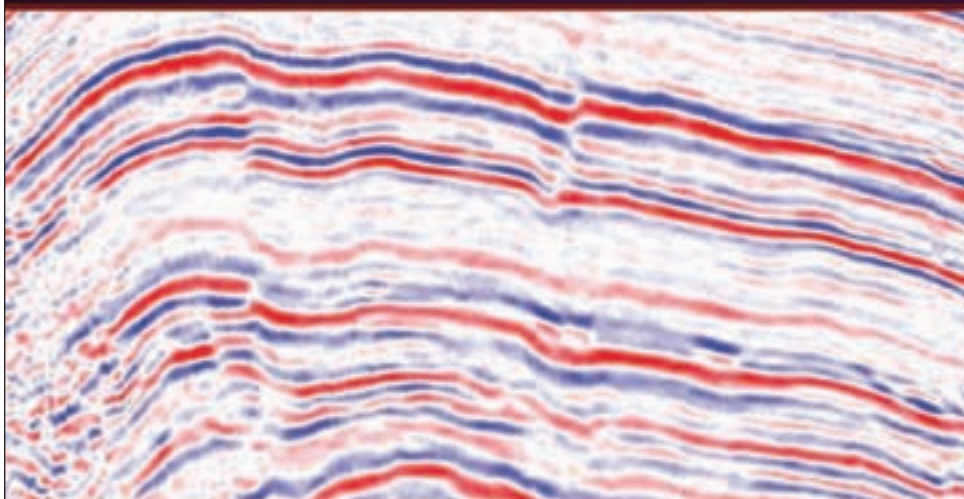
"The public needs to know that we are all very concerned about the environment," he continued. "The people in the oil industry live here, too – we need energy, and currently the oil industry provides most of the easily portable energy."

Presenting the Process

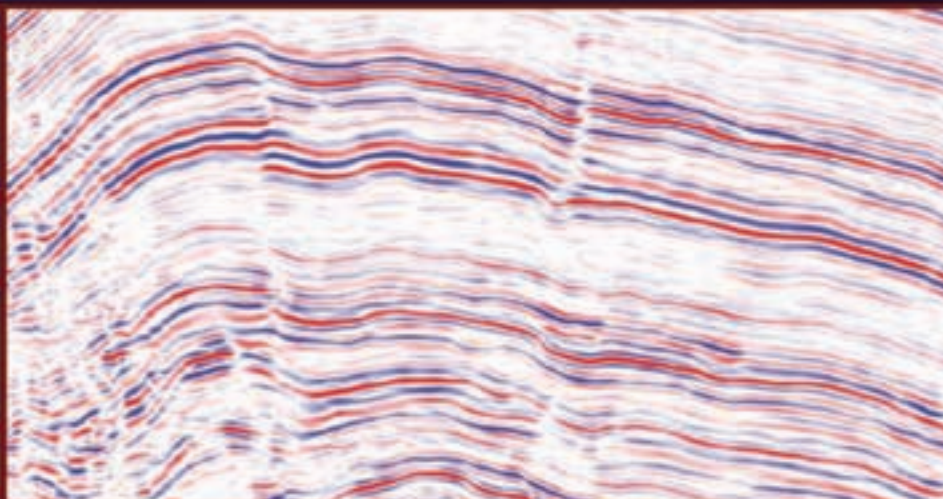
Clarke, who currently is a consulting geologist for companies such as Tideland Oil Production Company, Signal Hill Petroleum and Vintage,

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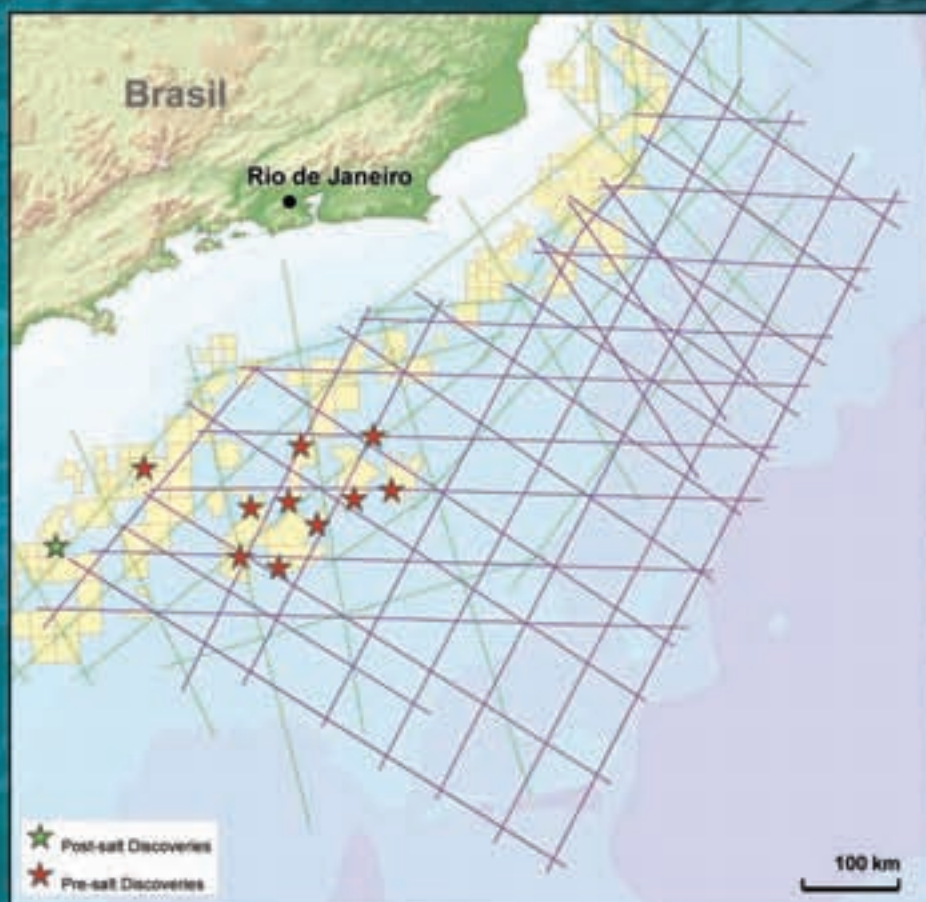
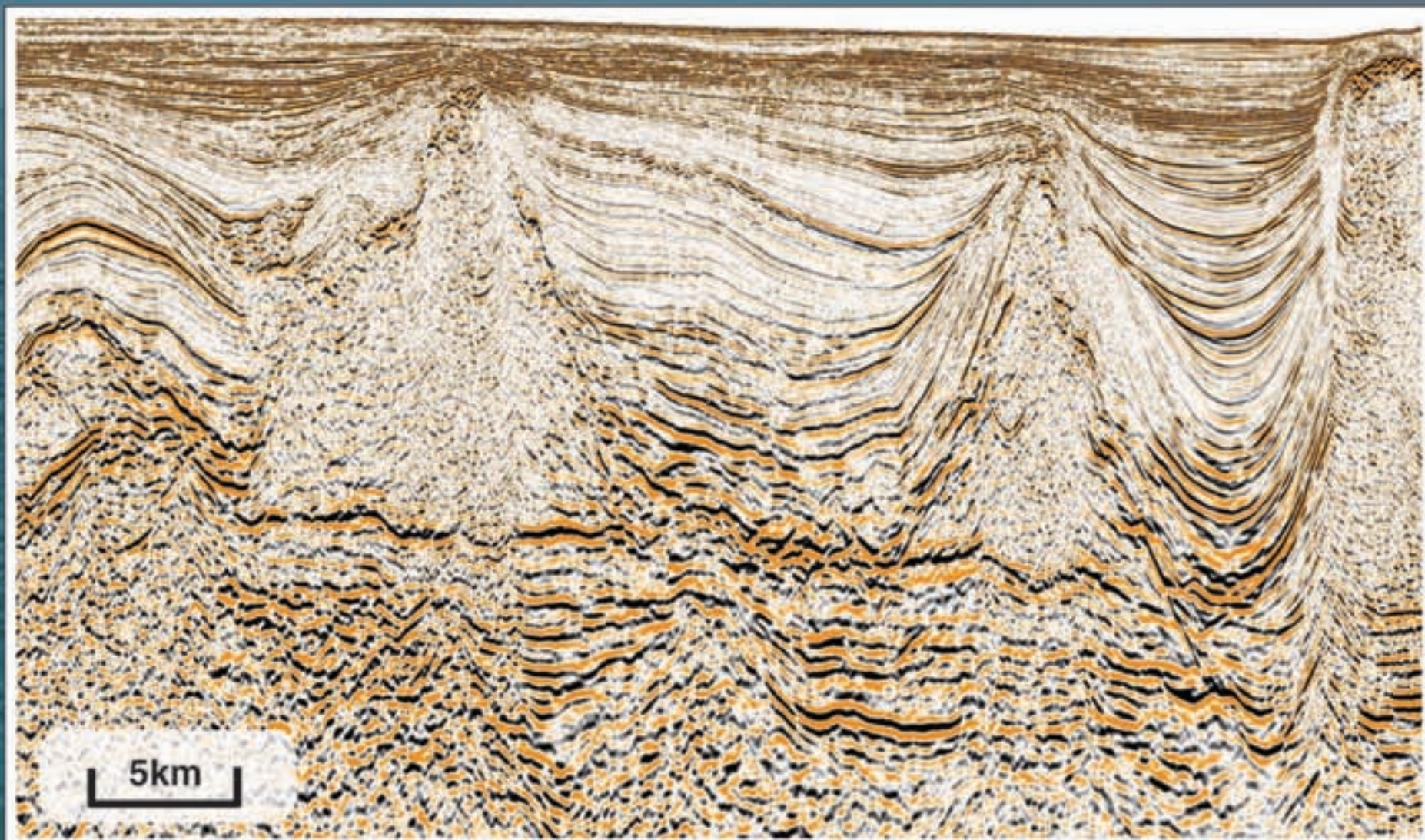
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New Life

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How It Works

Here's the blueprint.

The installation of the Linear Driver at the wellhead is completely non-invasive. The continuous flow of high-pressure gases and/or liquids through the engine delivers continuous force in order to produce direct generation of AC or DC power.

This occurs through the connection of the power output rod to a "linear-motion-to-rotary-motion" conversion transmission via a 90-degree perfect vector angle that provides maximum power transfer in order to drive a standard rotary electrical alternator.

To kick off the process, a coiled tubing stringer is placed in the well,

and the operator injects a liquid phase working fluid, such as CO₂, propane, ethane, etc.

"When it shoots into the well at depth, it turns into gas," Hunt said. "What causes it to go to gas is it boils using the heat energy of the well, so that's the geothermal.

"Then the gas lifts the well, so it creates co-production of oil and gas recovery along with geothermal energy and kinetic energy because the total flow of the gas created in the well, the water within the well and the natural gas and oil all comes and runs through our machine and turns into power," Hunt explained.

"When the liquid changes phase from liquid to gas, it expands to a lot bigger volume," he said, "so now that volume drives a piston and creates energy.

"We cool the gas by blowing air over it and it turns back to the liquid phase, and we pump it back into the well in a



The engine that turns watered-out wells into long-life electrical power producers.

closed cycle," Hunt added.

He said the process is referred to as the Organic Rankine Cycle, often called a binary cycle. It differs from a binary cycle, however, in that they use the wellbore as a boiler.

"What makes it so powerful is the water," Hunt said. "Most binary cycles

only produce gas by indirect heat exchange at the surface."

He expanded on this process based on the formula for kinetic energy: Kinetic Energy = one-half mass times velocity².

In other words, the faster water travels the more velocity it has, and the velocity is squared in the formula. So as the velocity increases, the power increases.

"You have high mass water that's accelerated by the gas to high velocity," Hunt said, "so you get an enormous amount of power that the normal binary cycle without water doesn't perform.

"The binary cycle is modified in that we're injecting into hot water deep within the wellbore, which accomplishes direct heat exchange," he said, "and getting gas lift of the total flow of high velocity water and gas back to our unit to drive it, along with valuable natural gas and oil co-production.

"It's a unique cycle," Hunt said, "and a unique piece of equipment." □

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Spotlight

from page 28

believes the industry's story is one that it can't always tell itself – which is why a show like "Gallon of Gas" is so valuable.

"It is exceedingly tough for AAPG to educate the public," he observed. "Mainstream media have huge audiences."

"Gallon of Gas," he says, gives the industry a chance to actually contact a greater percentage of the public.

Clarke, a former chairman of the House of Delegates who has won the AAPG Distinguished Service award, DEG's Public Outreach Award and three AAPG Certificates of Merit, thinks that contact is necessary to sort out the industry's public relations persona, which he says keeps changing.

"In the first half of the 20th century the oil man was considered as an adventurous sort of guy who looked danger in the eye and went after the prize. He was sort of an American hero," he said. "Old movies like 'Tulsa' and 'Boomtown' expressed the general feelings at the time."

But then, in the '60s and '70s, a change took place.

"The oil industry was considered bad because they were big, powerful and not interested in protecting the environment," he said.

But like the earlier perception, Clarke says, "Our industry seems to have just taken the hits with little concern. Many felt that the oil industry was in bed with the government and just didn't care."

Unfortunately, he says, "I have seen little improvement in public attitude since."

"I think that we still have problems," he said. "There is not a lot of public trust. For example, most people feel that the oil industry spills a lot of oil, thus contaminating the environment. They don't realize that the oil industry actually does not spill much. Most of the spillage is from the consumers and transportation."

Problems and perceptions aside, Clarke believes "Gallon of Gas" can educate on a process that is at best unknown, at worst misunderstood.

"Very few people realize how much effort it takes to bring oil to the consumer," he said. "Finding oil is difficult, and the petroleum geologist has done a fine job. This show should give the viewer a good idea of the process."

It is a process, perhaps like the industry itself, which can be summed up by a line from another song:

What a long, strange trip it's been. □



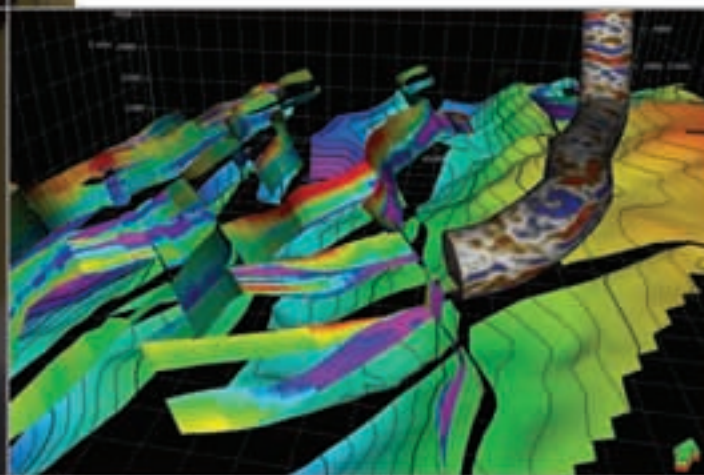
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GEOPHYSICALcorner

Tuning Effects' Impact on Seismic

(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. This month's column deals with tuning effects in seismic data.)

By GWANG LEE
KEUMSUK LEE
and HAN KIM

Seismic reflection amplitude can be related to net pay and can provide information about the presence or absence of hydrocarbons in a reservoir interval.

Information extracted from reflection amplitudes, however, becomes ambiguous when there are two or more closely spaced reflectors, because reflections from these interfaces interfere constructively or destructively, depending on the time delays between successive reflection events and the shape of the illuminating wavelet.

The variation in the shape of a reflection wavelet created by closely spaced reflecting interfaces is called tuning effect.

* * *

When reflection times are measured along the peaks, troughs or zero crossings of seismic traces, tuning effects make it difficult to measure accurate arrival times of individual reflection events.

The thinnest interval over which a correct measurement of the distance between two closely spaced reflectors can be made is called the tuning thickness. The edges of reservoir bodies are often thinner than tuning thickness, and therefore a special approach – such as spectral decomposition or inversion – is required to reliably determine reservoir boundaries.

We examine the tuning effect for a low-impedance wedge (figure 1) that mimics a gas-sand layer embedded in shale. The wedge is illuminated by zero-phase and minimum-phase Ormsby wavelets that have identical frequency spectra (figure 2).

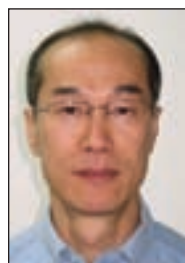
Figure 3a shows the synthetic seismic section when the wedge is illuminated by a zero-phase Ormsby wavelet. The lateral dimension of the wedge in units of the dominant wavelength ($\lambda = 97$ m) of the illuminating wavelet is marked on the top of the section. The top and base of the wedge (green horizons) were picked by snapping to the central trough and central peak, respectively.

The thickness estimate and amplitude tuning curves measured from the seismic response are shown as figures 3b and 3c, respectively. Labels are added to these curves to indicate the thickness of the wedge in units of the dominant wavelength.

Trough-to-peak time measurements (figure 3b) give the correct wedge thicknesses when the thickness is greater than about $\lambda/5$ (19 m), although side lobes produce minor errors when thickness is near this tuning value.

This tuning thickness is less than the Rayleigh resolution limit ($\lambda/4$), which is commonly accepted as the threshold for vertical resolution.

When the wedge is thinner than the tuning thickness, the top and bottom reflections are pushed apart and cause arrival times to be slightly too early for



G. Lee



K. Lee



Kim

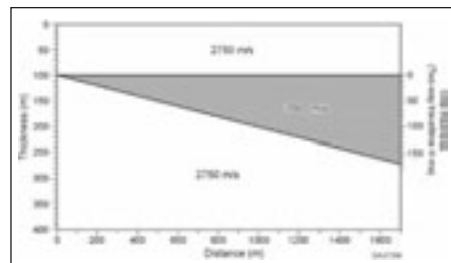


Figure 1 – Geometry of the wedge model, mimicking a gas sand layer embedded in shale.

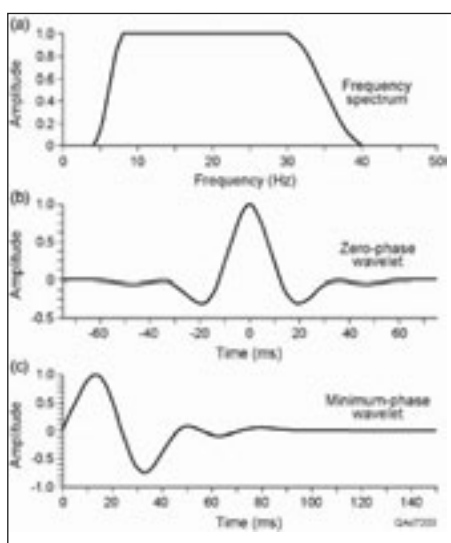


Figure 2 – (a) Amplitude spectrum of the Ormsby wavelet used in modeling. The four corner frequencies are 4, 8, 30, and 40 Hz; (b) The corresponding zero-phase wavelet; (c) The corresponding minimum-phase wavelet.

the top of the wedge and slightly too late for the bottom. Thus the measured thickness is greater than the true thickness when the wedge thins to less than $\lambda/5$.

The threshold thickness above which the measured amplitude (figure 3c) gives the correct reflectivity of the top of the wedge is about $5\lambda/8$ (60 m). For wedge

picking was used for the base of the wedge where snap picking became erratic due to tuning effect.

The top and base of the wedge (green horizons) also were picked by snapping to the leading trough and leading peak, respectively. The thickness estimate and amplitude tuning curves are shown on figures 4b and 4c, respectively.

thicknesses less than $5\lambda/8$, the amplitude tuning curve is characterized by two maxima at about $\lambda/5$ (19 m) and about $\lambda/2$ (45 m). These maxima occur when the central trough of the top reflection aligns first with the leading negative side lobe of the wavelet from the bottom interface and then with the trailing negative side lobe.

As the wedge thins to less than $\lambda/5$, the amplitude decreases rapidly, reaching about -0.02 , which is approximately only 10 percent of the correct reflectivity.

* * *

Figure 4a shows the synthetic seismic section when the wedge model is illuminated by the minimum-phase wavelet. The top and base of the wedge (yellow horizons) were picked by snapping to the leading zero amplitudes of the trough and the peak, respectively. Manual

The thickness tuning curves from zero-amplitude picking (dashed blue line, figure 4c) and from the trough/peak picking (green line) both give the correct thickness until the wedge thins to about 21 m (slightly less than $\lambda/4$).

The measured amplitude of the leading trough along the top of the wedge gives the correct reflectivity of the sand/shale interface until the wedge thins to approximately $\lambda/8$, slightly larger than one-half of the Rayleigh resolution (figure 4c).

There are no amplitude maxima as exhibited by the zero-phase wavelet (figure 3c), because the leading peak from the bottom reflection does not constructively interfere with the leading trough of the top reflection event.

The amplitude again decreases rapidly below the threshold thickness, reaching about -0.02 .

* * *

Our synthetic modeling shows:

- ✓ Tuning thicknesses for both zero-phase and minimum-phase data are slightly less than the Rayleigh resolution limit.

- ✓ Event amplitudes can be better measured from minimum-phase data than from zero-phase data.

- ✓ Amplitude detuning is probably not required for minimum-phase data for bed thicknesses greater than about one-half of the Rayleigh resolution limit.

Because event amplitudes in zero-phase data are significantly affected by tuning, amplitude interpretations based on zero-phase data should be calibrated or detuned for correct amplitude analysis.

(Editor's note: AAPG member Gwang Lee is with Pukyong National University; AAPG member Keumsuk Lee is with Korea National Oil Corp.; and Han Kim is with the Korea Ocean Research and Development Institute.) □

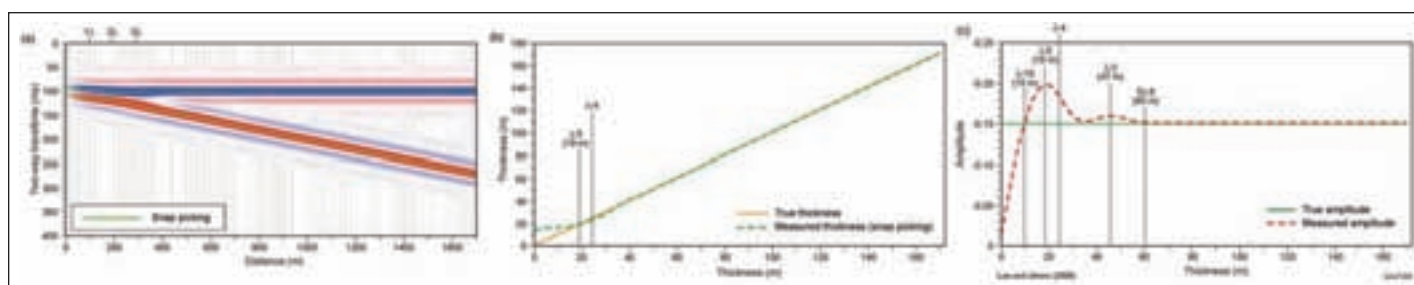


Figure 3 – (a) Synthetic seismic section when the wedge model is illuminated with the zero-phase Ormsby wavelet. Green horizons are the top and base of the wedge picked by snapping to the central trough and central peak, respectively. The lateral dimension of the wedge in units of the dominant wavelength (λ) of the Ormsby wavelet is marked along the top of the section. (b) Tuning curve for bed thickness and (c) for amplitude. The tuning thickness ($\lambda/5$) is less than the Rayleigh resolution limit ($\lambda/4$). Below $5\lambda/8$, the amplitude tuning curve is characterized by two maxima at about $\lambda/5$ (18 m) and about $\lambda/2$ (47 m).

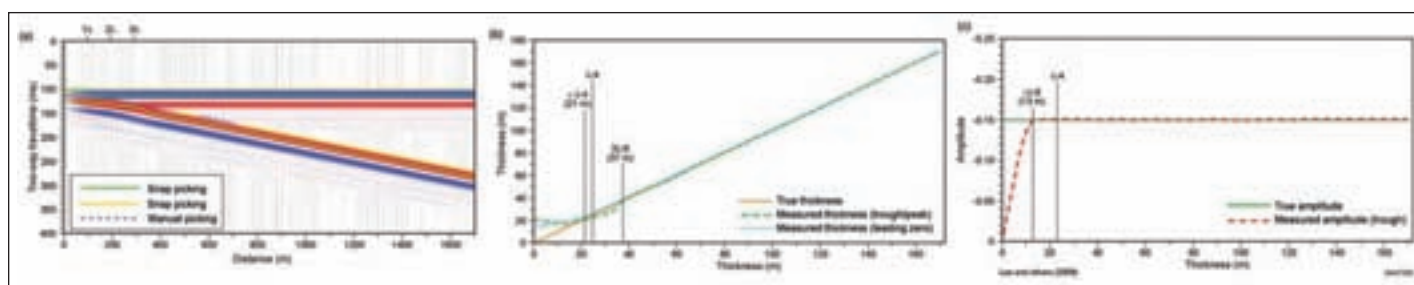
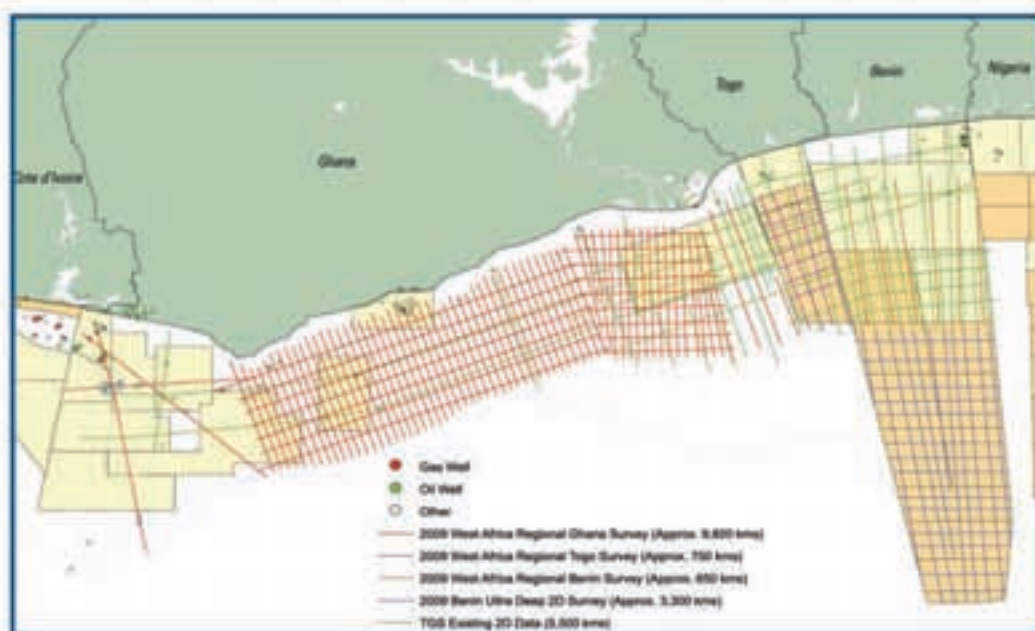
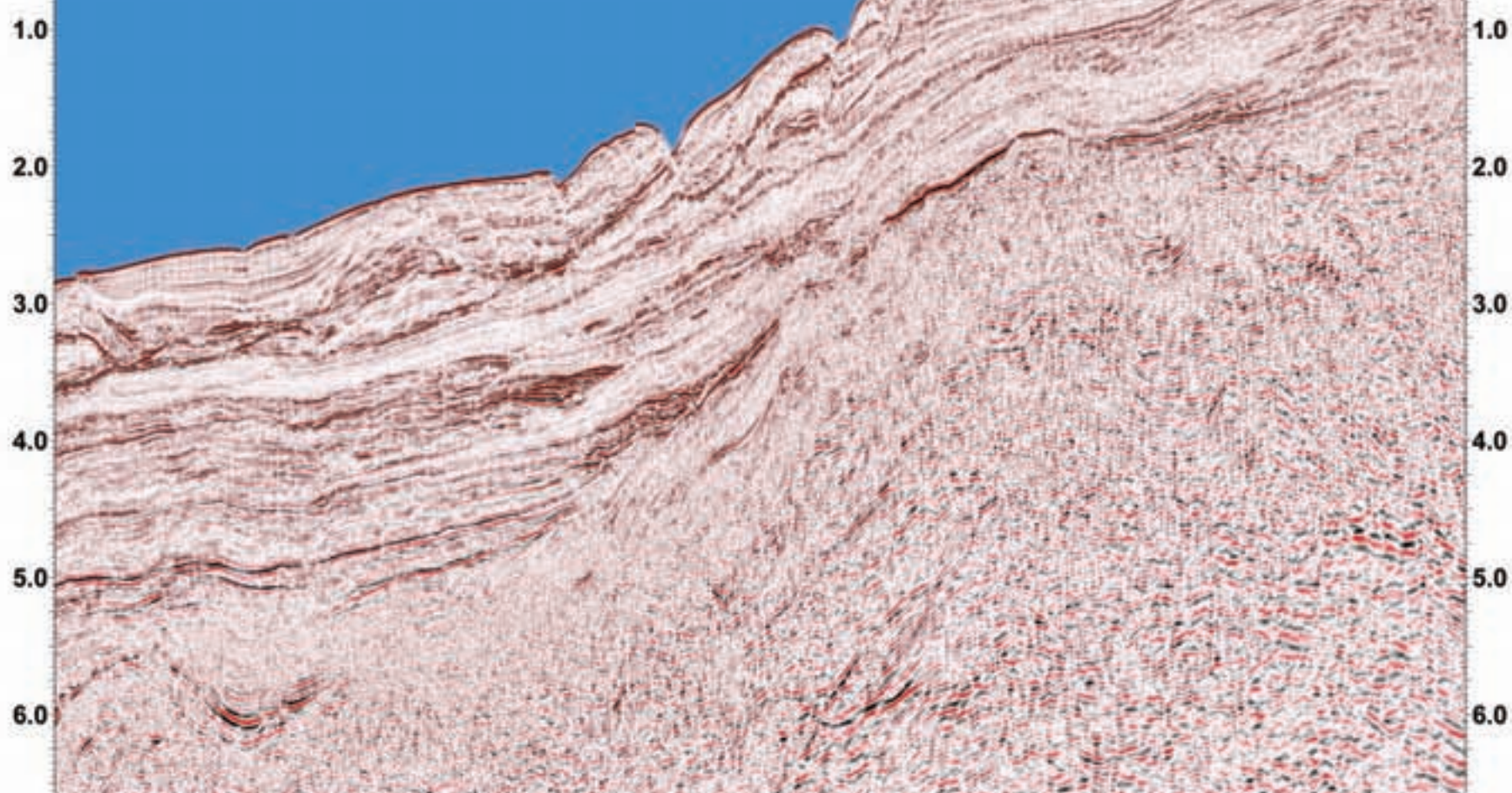


Figure 4 – (a) Synthetic seismic section when the wedge model is illuminated with the minimum-phase Ormsby wavelet. The top and base of the wedge were picked by snapping to the leading zero amplitude (solid yellow horizon) and also to the leading trough and leading peak (solid green horizon). Manual picking was used for the base of the wedge (dashed horizon) where snap picking became erratic due to tuning effect. The lateral dimension of the wedge in units of the wavelength (λ) of the Ormsby wavelet is marked on the top of the section; (b) Tuning curve for bed thickness and (c) for amplitude. The tuning thickness from the leading zero crossing (dashed blue line) and the trough/peak picking (green line) are both about 21 m, but the errors in the tuning vicinity for the trough/peak picking are larger than those from the zero-phase Ormsby wavelet. There are no tuning amplitude maxima.

Rediscover West Africa!



Given recent discoveries in Ghana, it is timely to consider the potential of shelf, slope and deep water areas in this region using modern geophysical data. TGS has 5,500 km of seismic data currently available and has acquired surveys, offshore Ghana, Togo and Benin, which will feature:

- 2D seismic for a total of 20,000 km in the region:
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 - **New!** West Africa Regional Ghana 2D 9,800 km acquired
 - **New!** Benin Ultra Deep 3,300 km in progress
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 - **New!** West Africa Regional Benin 650 km in progress
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WASHINGTONwatch

Rare Elements Policy Offers a Lesson

By DAVID CURTISS
GEO-DC Director

Let's face it, most geology news in the popular press is event driven. Soaring oil prices was last year's headline. Earthquakes and volcanic eruptions grabbed media attention this year.

Rarely, however, do the media talk about the role geosciences play in everyday life, delivering such necessary things as fuel, raw materials and clean water. These are taken for granted.

But this summer the *New York Times* and *U.S. News and World Report* both published stories about rare earth elements and the increasingly tough competition for a limited supply of these elements.

Rare earth elements are not something I think about regularly. In fact, I had to pull my freshman chemistry textbook for a quick refresher.

Rare earth elements are not rare at all in terms of being scarce. They are the Lanthanides, and are usually separated from a standard periodic table right after lanthanum and placed below the chart. They begin with cerium (atomic number 58) and include neodymium, gadolinium, dysprosium and others, ending with lutetium (atomic number 71).

Maybe it's just me, but terbium (atomic number 65) rarely rises into my consciousness. Why then am I reading articles about it in the *New York Times*?

* * *

It turns out these rare earth elements are needed for, among other things,



Curtiss

green energy and military technologies. They are essential components of magnets used in wind turbines and electric motors, such as those found in the Toyota Prius.

Increases in alternative energy production and more efficient use of fossil fuels through hybrid and plug-in hybrid technologies are driving significant demand for these elements. Yet today the majority of these elements are produced by only one nation: China.

One day after the August Leadership Conference in Tulsa, the *New York Times* published an article titled, "China Tightens Grip on Rare Minerals." Author Keith Bradsher reported that China currently produces 93 percent of the world's rare earth minerals and 99 percent of the world's dysprosium and terbium.

China is now reducing export quotas for these elements, both to ensure it has sufficient supply for its own needs but also to attract foreign direct investment. When manufacturers move their

It also is due to policy makers lacking a framework for thinking about these issues.

production facilities close to the raw material source it brings technology, investment and jobs to China.

Predictably, most articles about this issue discuss it within the geopolitical context of China, an economic powerhouse, ensuring that its resource needs are met – the implication being that other economies will not be able to secure the resources they need. A July 2009 *U.S. News and World Report* article titled, "America's New Energy Dependency: China's Metals," by Kent Garber, presents the current situation and how we got here.

Notwithstanding the title of the article, what emerges from Garber's analysis is less a story of the haves and have-nots – recall that rare earth minerals are not scarce – but rather one of strategic intent in China and no strategy elsewhere.

According to Garber, the United States was the principal producer of these minerals in the 1970s and 1980s. But China's fabled leader Deng Xiaoping recognized his country's potential and

articulated strategic intent: "The Middle East has oil; we have rare earths," he said. "We must develop these rare earths."

That is what they did, eclipsing the U.S. producers and forcing many of them to close or to move.

Fundamentally, this is a story of policy makers in the United States and elsewhere not understanding the long-term and collective impacts of individual policy decisions (or lack thereof). This is, in part, due to the nature of our two-party system. But it also is due to policy-makers lacking a framework for thinking about these issues.

The U.S. National Research Council recognized this deficiency. In 2008 its Committee on Earth Resources issued a report titled "Minerals, Critical Minerals and the U.S. Economy," that seeks to present a framework for policy makers to use in evaluating minerals and their relationship to the U.S. economy.

The study urges policy-makers to begin assessing the criticality of all minerals, enhance the data collected and analyzed by U.S. agencies and fund research to improve our understanding of global mineral resources.

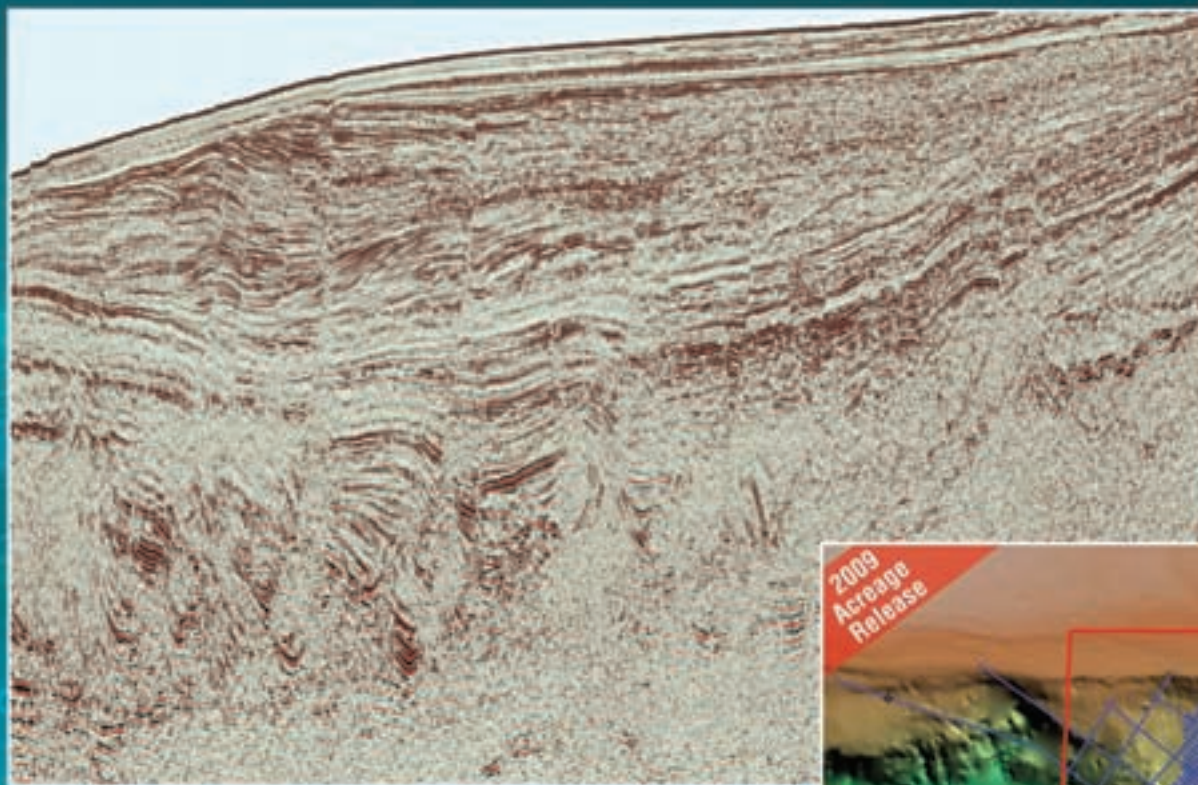
* * *

In my mind, the rare earth minerals story has strong parallels with issues confronting the oil and gas community.

As Congress considers opening or restricting access to public lands for

See [Washington](#), page 36

Great Australian Bight Project - Ceduna Sub-Basin



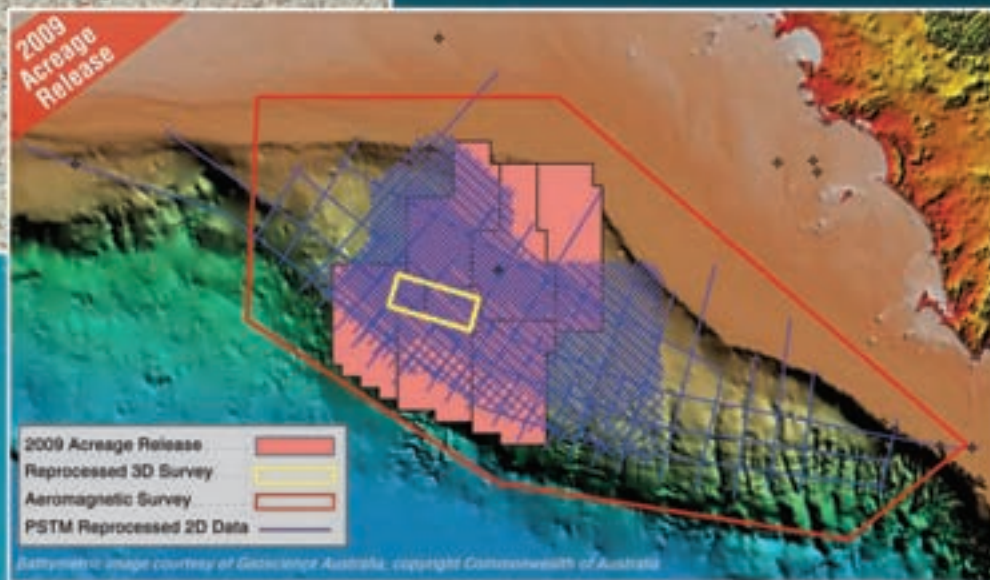
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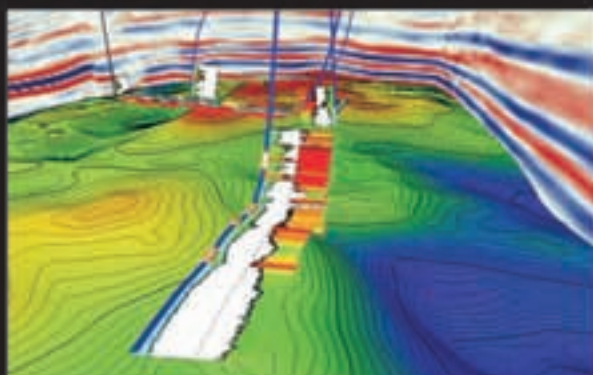


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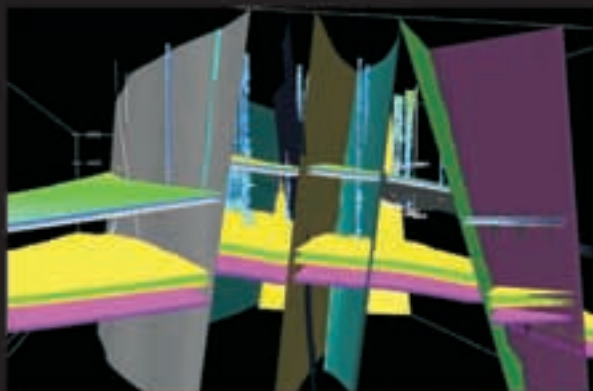
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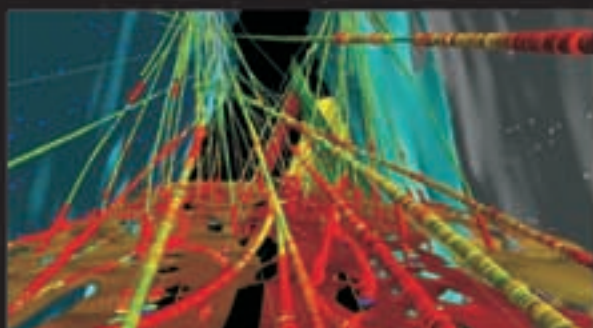
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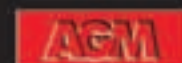
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Washington

from page 34

exploration and development, restrictions on well stimulation techniques like hydraulic fracturing, or tax policies that discourage rather than encourage production, are they considering the long-term effect these decisions will have?

Please join me on the GEO-DC blog to discuss this further. Look for the October Washington Watch post and share your ideas in the comment section of what these long-term effects for rare earth minerals, energy technologies, the economy and oil and gas might be.

As a scientific and professional association this is an area where members can provide valuable

information and expertise. Come join the conversation.

URLs for referenced links:

✓ N.Y. Times – www.nytimes.com/2009/09/01/business/global/01minerals.html.

✓ U.S. News and World Report – www.usnews.com/articles/news/national/2009/07/01/americas-new-energy-dependency-chinas-metals.html.

✓ National Research Council – www.nap.edu/catalog.php?record_id=12034.

✓ GEO-DC blog – blog.aapg.org/geodc.

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

PROFESSIONALnewsbriefs

Scott Balke, to geoscience supervisor-Africa, Noble Energy, Houston. Previously geomodeling director, ConocoPhillips, Houston.

Bobby H. Bammel, to geologist, Saudi Aramco, Dhahran, Saudi Arabia. Previously geosteering consulting geologist, BHL Consulting, Granbury, Texas.

Timothy Berg, to senior geophysicist, BP, Houston. Previously senior geophysicist, BP Exploration, Aberdeen, Scotland.

Bill Elliott, to chair of the geology and physics department, University of Southern Indiana, Evansville, Ind. Previously geology coordinator and associate professor, Southern Oregon University, Ashland, Ore.

Ben J. Francka, to owner, BJF Environmental Consulting, Springfield, Mo. Previously senior project manager/geologist, Environmental Works, Springfield, Mo.

Eldar Hasanov, to regional manager, Era Energy, Ankara, Turkey. Previously regional geology manager, Nations Petroleum, Bakersfield, Calif.

Wilbert L. Mathews, to business development manager-South and East Africa, Welltec A/S, Cape Town, South Africa. He also is general manager, Mathews Consultores de Petroleo, Luanda, Angola.

Barry Ringer, to Far East regional manager, Fugro Robertson, Kuala Lumpur, Malaysia. Previously Middle East regional manager and director-business development, Fugro Robertson, Abu Dhabi, UAE.

Kweku-Mensah Sagoe, to technical director, Zobeten Petroleum Nigeria. Sagoe remains CEO, Eogas Petroleum and Geosciences, Lagos, Nigeria.

Brian Scott, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, University of Kentucky, Fayette, Ky.

Michael Strickler, to Gulf of Mexico Paleogene exploration manager, Hess Corp., Houston. Previously senior geological adviser, Hess Corp., Houston.

Thomas E. Voytovich, to vice president and general manager, Apache Egypt, Cairo, Egypt. Previously region vice president, Apache Corp., Tulsa.

Michael Webb, to manager-geology and geophysics, in situ-Mackay River asset team, Suncor Energy, Calgary, Canada. Previously senior geologist, Petro-Canada, Calgary, Canada.

(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, smoore@AAPG.org; or submit directly from the AAPG Web site, www.aapg.org/explorer/pnb_forms.cfm.)

Inmemory

Julius Babisak, 90
Dallas, May 31, 2009
John William "Bill" Bedford, 82
Evergreen, Colo., Aug. 8, 2009
Edward C. Dapples, 102
Peoria, Ariz., May 10, 2009
Jay R. Endicott Jr., 88
Corpus Christi, Texas, July 4, 2009
Harold D. Fox, 87
East Orleans, Mass., July 9, 2009
Louis Martin Martinez, 77
Houston, July 29, 2009
James Durwood Pate, 86
Oklahoma City, June 18, 2009
John L. Watson, 62
Calgary, Canada, Nov. 13, 2008
Roland F. Wright (EM '59)
New Port Richey, Fla.

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

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AAPG FOUNDATION



Inspiring Future Geologists

Outreach to students from kindergarten through high school is one of the top areas of interest for AAPG members. The AAPG Foundation has been a strong proponent of K-12 activities and recognizes the importance of addressing the issues related to youth science education while influencing young students' knowledge of earth sciences and energy issues.

Currently, the AAPG Foundation provides support to successfully established programs, such as Earth Science Week, More! Rocks in your Head workshops, the Bookout Initiative and National Science Bowl.

NOW is the time to expand the K-12 Education programs! Your involvement is *essential* to increase outreach and awaken young students' appreciation of geosciences and energy.

How can YOU help?

You may direct your **tax-deductible** contribution toward the AAPG Foundation "K-12 Education Fund."

Should you wish to make a gift to the K-12 Education Fund or to receive a five-year pledge commitment form, please contact Rebecca Griffin, 918-560-2644, rgriffin@aapg.org or Alison Robbins, 918-560-2674, arobbins@aapg.org



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3. SUPPORT the AAPG Foundation programs.



This extended opportunity will allow you to select the program or endowment of your choice. For a description of funds, see the Foundation's website page: <http://foundation.aapg.org/fundsdescription.cfm>

If you are interested, please consult your tax advisor. Should this be deemed a beneficial option for you, we hope the AAPG Foundation programs will be considered. Provision ends December 31, 2009!

Additional questions?

Contact Rebecca Griffin, Foundation Manager at 918-560-2644 or rgriffin@aapg.org or Alison Robbins, Development Coordinator at 918-560-2674 or arobbins@aapg.org

FOUNDATIONupdate

Fund Started to Assist IBA Program

By REBECCA GRIFFIN
AAPG Foundation Manager

A new fund has been established by the AAPG Foundation to accept corporate and individual donations to AAPG's successful Imperial Barrel Award program.

The IBA is an annual prospect/exploration evaluation competition/presentation between university student teams competing to win scholarship funds dedicated to petroleum geoscience education created for geoscience graduate students. The rigorous program contributes to AAPG's mission of promoting petroleum geoscience

training and advancing the careers of geoscience students.

In it, university teams around the world compete in regional contests to win the right to advance to the final competition held at the start of AAPG annual conventions.

IBA finals teams analyze a complete dataset (geology, geophysics, land, economics, production infrastructure and other relevant materials) for six to eight weeks prior to the competition. Each team then delivers its results in a 30-minute presentation to a panel of industry experts.

Students gain experience using real

technology on a real dataset.

Additionally, students benefit from industry panel feedback, the opportunity to impress potential employers in the audience and the chance to win cash prizes for their schools.

The 2009 IBA was won by the team from Moscow (Russia) State University, which earned \$20,000 for their petroleum geoscience department. Finishing second was the team from the University of Nebraska (\$10,000 prize), and taking the \$5,000 third place prize was the team from Memorial University (Newfoundland, Canada) (See July EXPLORER).

* * *

In other Foundation news, chairman William Fisher announced approval of:

✓ \$10,000 funding to support AAPG's Student Focus Committee for a GSA Booth in Portland, Ore.

✓ \$5,600 in support of the 2009-10 Professorial Grants.

✓ \$30,000 to support the AAPG education department's new "Opencourseware" online courses.

✓ \$10,000 to the AAPG Astrogeology Committee to support its publication of "Energy Resources for Human Settlement in the Solar System and Earth's Future in Space."

* * *

A contribution of \$100,000 from BP was designated to the Bridge Fund, in support of the feature length documentary film – currently in production – intended to create a culture of energy education and to help ensure a secure energy future.

* * *

Two AAPG members wanted to continue to support the Foundation's mission by including the Foundation in their estate plans. They are:

☐ **Henry Francis Nelson**, of Cumming, Ga.

☐ **Robert Maby Jr.**, of Houston.

For more information on this or other Foundation programs contact Rebecca Griffin at (918) 560-2644, or e-mail to rgriffin@aapg.org. ☐

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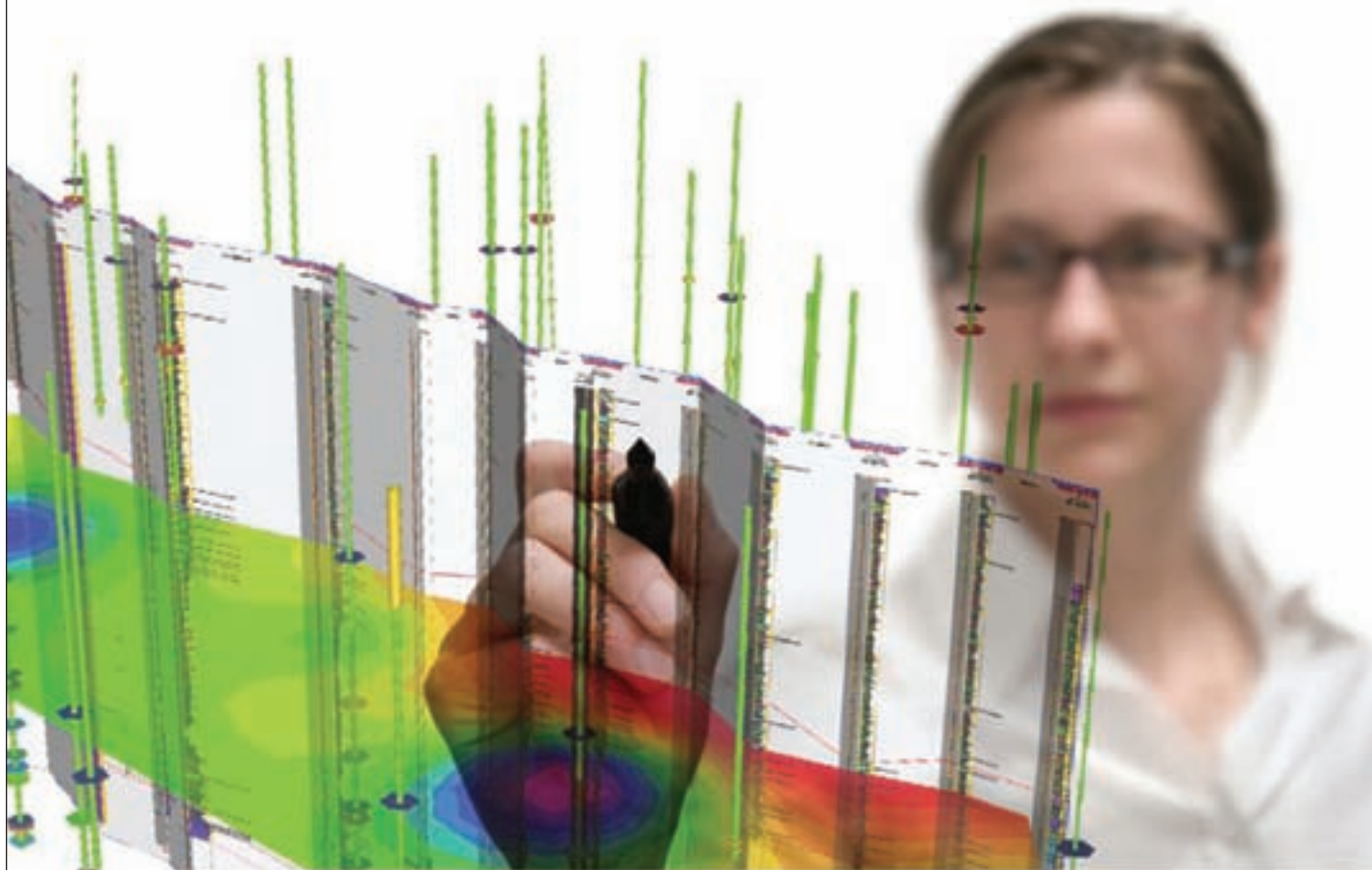
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Brazil may be the career-making opportunity you've been waiting for — and the meeting's fantastic technical program and historic ICE exhibition is the perfect way to get engaged in the century's top play. Your full-conference registration gives you access to:

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www.AAPG.org/Rio



REGIONS&sections

Positive Steps Fuel Global Growth

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

By PETER LLOYD
and MARTY HEWITT

A great deal of thought and hard work has gone into thinking through the AAPG's globalization strategy (and putting in place all the financial and legal protection to do it effectively). But when the AAPG's proposed Global Corporate Structure (GCS) was recently unveiled in Denver, some members were worried – very worried.

Most concerns centered around the suggested "North American Region" and an "Overseas Holding Company." These concepts represented uncomfortable new territory.

There also was the spectre of extensive bylaws changes, and the GCS committee's caveat – "One certainty in a major change such as this is that few things are created and perfected at the same moment in time" – was little cause for comfort.

It all sounded like a tough field to plough.

However, the last few weeks of detailed deliberations by the AAPG Constitution and Bylaws Committee (C&BLC) reveal a very different reality. Significantly, Executive Director Rick Fritz (with AAPG legal counsel's advice and informed by SPE's experience) advised that the holding company concept is premature if not completely unnecessary.



Lloyd



Hewitt

Further legal counsel advice has stated: "Region offices, as incorporated now, are adequately protected in both the legal and financial sense. As to contract disputes, tort protection poses a more difficult challenge. But, in reality, no corporate structure gives complete protection, and such risk is probably nowhere more acute than in the United States."

Take this – and the C&BLC's recent opinion that the governance of the organization can currently support healthy international growth, without any need for

radically restructuring the organization – and the future is bright indeed.

* * *

The global future of the AAPG will be in the hands of regional AAPG-HQ offices and the increasingly empowered and vibrant overseas Regions. To achieve success, the Regions will have to work closely with their local affiliates to offer cost-effective and tailored services, including cross-discipline collaboration with sister associations.

Back in the mid-1990s the AAPG was ahead of most other overseas geoscience organizations in how it managed big international conferences and mid-sized but more focused Hedberg research symposia, along with both its Distinguished Lecturer and education programs. The Association's flagship Memoir publications – in Sequence Stratigraphy, Petroleum Systems and New Frontiers for Exploration and technical mastery in so many domains – made membership a very sound investment.

AAPG's leadership reached out to the members in the Regions, opening positions in the HoD, the Advisory Council and the Executive Committee. Our international Active membership category increased, despite the difficult business environment of low oil prices, and we managed some exceptional international conferences and exhibitions. Active membership for internationals reached an all time high in 2001.

But then that growth in Active membership stalled. Cited reasons are that we missed opportunities to set up regional offices, lost ground with our overseas outreach education programs and we did not sustain close enough links with all our international affiliates. Competition from regional societies in our traditional overseas heartlands became significant as they set up regional support teams. Additionally, there was a withdrawal of personnel working on North Sea projects.

As a result, since that peak in 2001 our international Active membership has dropped 17 percent.

This decline in international "Actives" is clearly greater than the 14 percent experienced domestically in "Actives" in the same timeframe.

We have seen impressive growth in student membership, which is the main reason why total overall international AAPG membership has increased over the same period – but while our student initiatives in this period were a real highlight, only a modest percentage of those students could be expected to find employment, and thereby move on

See **R&S**, page 49

Cairo GTW Report Available Online

A comprehensive look at the use of cutting-edge technology in Egypt's Western Desert – including the application of new seismic, drilling and stimulation operations – helped make AAPG's first international Geoscience Technical Workshop a big success.

The GTW, held in late April near Cairo, Egypt, was a specialized workshop on a petroleum province that has been the site of extensive oil and

gas exploration for more than 50 years – but one that has experienced revitalization due to technological advances and the resulting improvements in discovery rates and increased production.

For a report on the Cairo GTW by co-convenors David Blanchard, of El Paso Egypt, and Mostafa el Bahr, of Egyptian General Petroleum, see the AAPG EXPLORER Web site.

Online offerings include:

E-Symposium Series

Each symposium includes one hour of professional instruction and one day of independent study, with value pricing for members (\$75) and optional CEU credits (\$100). Missed an earlier symposium? Archived materials and presentations also available.

Upcoming symposia:

- Fluvial Stratigraphy (Oct. 22)
- Thermal Maturation (Oct. 29)
- GIS in the Field: Office to Mobile Workforce Integration (Nov. 5)
- Carbon Sequestration (Nov. 19)

Materials also available for past symposia:

- Wind Farm Operations: Current Practices & Future Trends
- 3-D Seismic Profiles of Shale Plays
- The Many Faces of GIS: Oil and Gas Applications, New Directions, Careers
- How Tight Is Your Gas? Thermal Profiling for Unconventional Oil & Gas
- Geothermal Energy in the Oil Field: Development & Opportunities

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- Solar Energy Basics
- Geothermal Energy Basics
- Biomass Energy Basics
- Integrating Renewable & Non-Renewable Energy

Classes begin in September 2009, so sign up today! www.aapg.org/education/online

Many of our other AAPG professional development courses are now also available online.


Visit our website: www.aapg.org/education/online/index.cfm for a complete list of course offerings.

- Reservoir Characterization
- Technical Writing
- More coming soon!

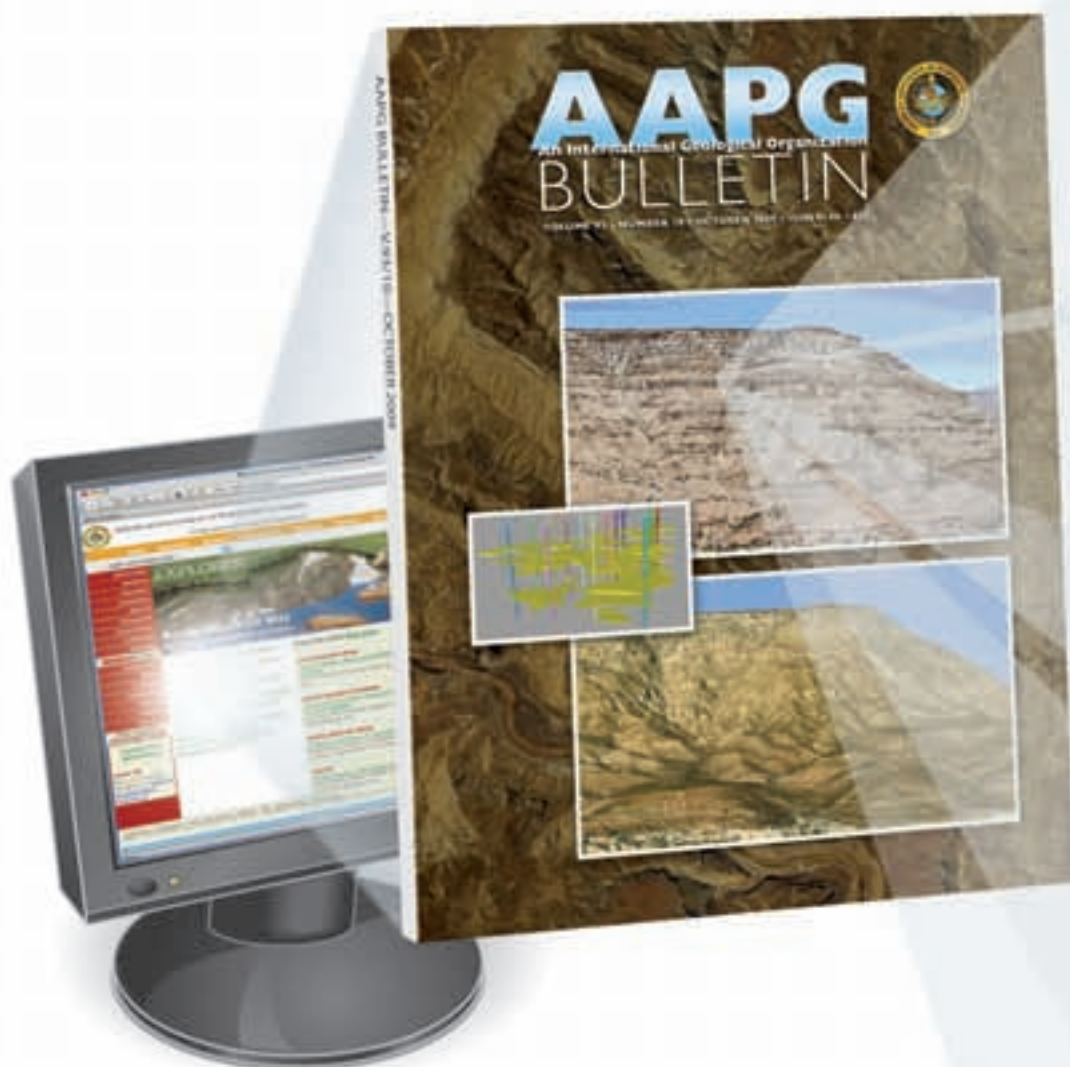
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The AAPG Bulletin is a technical journal that is recognized in the industry as the leading peer-reviewed publication for information on geoscience and the associated technology of the energy industry.

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



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



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

Article highlights include:

Leakage in a faulted anticline

Linji Y. An

ESP Note



Depositional sequences, original oil-water contacts, and compartmentalization by faults were investigated in the Tar zone, a lower Pliocene turbidite deposit. A paleochannel within this deposit was found to leak through several faults, causing reduction and depletion of hydrocarbons.

Digital Image Analysis

Ralf J. Weger, Gregor P. Eberli,
 Gregor T. Boechle,
 Jose L. Massaferra, and Yue-Feng Sun

Geochron



Digital image analysis quantifies the influence of pore types on velocity and permeability. Carbonates with a large amount of microporosity, a complex pore structure, and small pores generally show low acoustic velocity, and carbonates with simple pore structure and large pores show high acoustic velocity at a given porosity.

Reservoir Connectivity And Compositional Variation

Paul J. Mankiewicz, Robert J. Pottorf,
 Michael G. Kozar, and Peter Vrolijk



Resource exploitation in the Mobile Bay gas field, offshore Alabama, is challenged by reservoir quality, presence of H₂S, and preservation of hydrocarbons. This paper addresses the complex thermal and redox processes as they affect gas composition and reservoir connectivity.

Studying Sediment Distribution Patterns

Tor O. Sømme, Ole J. Martinsen,
 and John B. Thurmond



A submodern depositional environment is investigated in order to predict morphological characteristics and sediment transport in ancient source-to-sink systems where data are missing or where more detailed insight into the morphology and the sediment transportation systems is desired.

Attention Deepwater Explorers

Global Turbidite Field & Reservoir Database

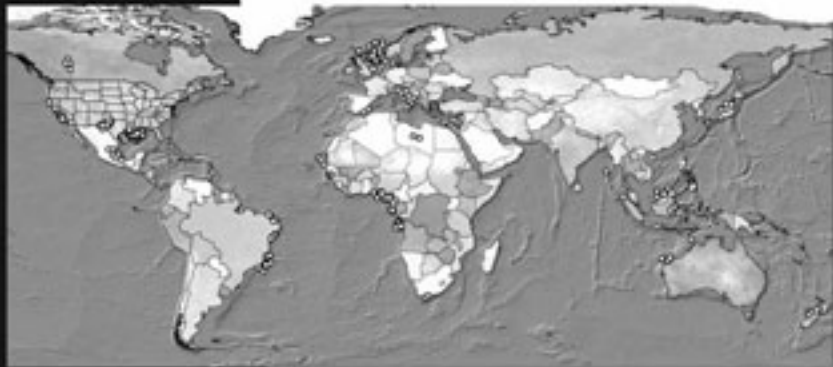
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turbidite.egi.utah.edu



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IPTC Registration, Program Online

Only a few weeks remain to save US \$100 on registration for the International Petroleum Technology Conference (IPTC), set Dec. 7-9 in Doha, Qatar.

Online registration is now available, as is the 72-page conference preview.

IPTC offers an interactive, multidisciplinary technical program addressing all oil and gas disciplines and relevant industry issues, based on the theme "World Energy Challenges: Endurance and Commitment."

In addition to its 50-plus technical sessions, IPTC offers an opening ceremony presented by renowned speakers, a plenary session and four

panel sessions:

✓ Session 1 – Environmental Solutions and Sustainability (Flaring Reduction, CCS, Drilling Technology, Efficiency Improvement).

✓ Session 2 – Global Work Force Capability and Capacity.

✓ Session 3 – Global Gas Outlook: New Gas Chains.

✓ Session 4 – Renewal of Reserves: Exploration, Improved Recovery and Unconventional.

Early-bird registration pricing ends Oct. 19. To register or for more information go online to www.iptcnet.org.

wwwUpdate

E-Conversations Add Career-Aiding Value

By JANET BRISTER
Web Site Editor

Embrace the insanity!

At the recent AAPG Leadership Conference in Tulsa a student told me how they held a meeting electronically "using AOL IM and Robert's Rules of Order." Now, those were two phrases I never would have expected to hear in the same sentence.

"IM" is AOL's instant message tool. For some college and high school students this tool is as critical to their lifestyle as sun tan oil is for beachgoers – they may not really need it but they aren't sure they can survive without it.

Contrast this statement to the reaction I received when I encouraged the "more veteran" members to begin investigating Twitter and Facebook.

"Just sign up and see what it's all about."

The response was defensive. "I can't capture the data sent me daily! Why would I want to add more?" sums up the reaction.

Ah-Ha!

What caught my attention was "the data!"

This was an "Ah-ha!" moment for me. This tweeting, texting, chatting generation that is beginning to show up in the professional world is not perceived by some as "data." It is simply casual conversation. Capturing, storing or recording is inconsequential.

Actually, the Twitter explanation page notes that you have the choice to totally ignore any messages sent by people you are following.

So why bother?

AAPG member Pete MacKenzie made a comment in a recent blog posting that really opened up my mind as to one way I could leverage Twitter as a useful resource.

He noted that it isn't so much for telling people about what you are doing as much as it is for learning what people are talking about.

As a consultant or independent, or someone who is looking to recruit new members for AAPG, this is a very important resource for joining in a conversation.

With a Twitter or Facebook account you can stay completely private and just read what others post. You never have to tell anyone about yourself and should you choose to no longer follow or be their friend they never know you left.

(Ever experience *that* in a conversation?) Here's an option: Sign up for a Twitter account and leave it private. Then select whom to follow.

This can be overwhelming, so I suggest you find AAPG's Twitter feed and look at three things: who we are following, who is following us and what our saved searches are.

From this you may find people you'd like to follow – then do so.

But take a minute to put in some search terms and see what you find. It is pretty amazing what people are talking about and how recent their post was on that topic.

You can save those searches for frequent references and to shorten your time spent during each session.

Next month: How independents might leverage their Twitter and Facebook accounts to help build their client base.

Good browsing!

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- Risk and Uncertainty Analysis for Unconventional Resource Plays
- "Old" (Pre-1958) E-Logs: A Quick Review
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**WEST TEXAS GEOLOGICAL SOCIETY
2009 FALL SYMPOSIUM
October 28-30, 2009**

***Elusive Hydrocarbons are Still to be Found in the
Permian Basin***

Please plan to attend the 21st West Texas Geological Society Fall Symposium during the final week of October. The two and one-half days of technical sessions will feature oral and poster sessions presented by outstanding authors showcasing current research, field studies and other aspects of the Permian Basin and analogous areas. The symposium provides attendees with a chance to network with their peers in a technical setting that also provides opportunities for social interaction.

Keynote: Dr. Mike Gardner, "The Value of a Complete Picture: How Geologic Research from the Permian Basin Impacts Local and Global Deep-Water Resource Development"

Discovery Forum: Highlights of some Permian Basin fields and how they were found as recounted by some top explorers (Moderators: Mike Party and Steve Shaw)

A sampler of topics being presented:

- Sequence stratigraphy, mineralogy and rock properties in the Woodford Shale, Permian Basin
- Petrophysical applications ranging from old E-logs to Nuclear Magnetic Resonance
- Gas Shale petrophysical evaluation methods including "The lost gas problem"
- Canyon Group carbonate-clastic transition, Eastern Shelf of Midland Basin
- Spraberry/Dean sedimentologic and diagenetic controls on reservoir quality
- Bone Spring synthesis, Delaware Basin
- Outcrop-based reservoir architecture of the mixed carbonate siliciclastic Grayburg Formation (Guadalupe Mountains) including specific Reservoir Applications
- Yates Formation stratigraphy in northern Midland Basin
- Suite of talks on diverse "alternative energies" ranging from biofuels, to nuclear, to ultra-shallow gas, gas hydrates, and CBM

The Fall Symposium will be held at the Midland Center in downtown Midland, Texas, with technical sessions and poster sessions taking place on October 28-30, 2009. The symposium will begin at 8:30 am on Wednesday, October 28 with registration beginning at 7:30 a.m. For more information, contact Executive Director Paula Mitchell at the WTGS office at (432) 683-1573, [wtgs@wtgs.org] or General Chairman David J. Entzminger at [Entzminger@whiting.com] (432) 686-6741. For information on technical sessions, contact Mark Sonnenfeld at [Sonnenfeld@whiting.com] (303) 390-4107 or Lyn Carter at [lyn.carter@whiting.com] (303) 357-1453. An Ethics Luncheon Presentation will take place on Thursday at the Midland Petroleum Club. The presentation will be given by Judge Lynn N. Hughes, United States District Judge, Houston, Texas. This presentation meets the Texas Registration requirement for Professional Development Hours for Geologists and Engineers.

To register, please send the completed form below with payment to: WTGS P.O. Box 1595, Midland, Texas 79702. Credit card payment may be faxed to (432) 686-7827. **Pre-registration and cancellation deadline is October 23, 2009.** A block of rooms has been reserved at the Midland Hilton. The hotel phone number is (432) 683-6131. Remember to ask for the special WTGS Symposium rate.

____ Symposium Pre-Registration \$125.00 ____ Symposium on Site Registration \$150.00 ____ "Ethics Luncheon Presentation" \$25.00

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I cannot attend but wish to order ____ photocopies of the symposium CD. Cost (thru 10/23/09) is \$30.00 per set plus \$7.40 tax, shipping and handling.

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**UPCOMING
REGIONAL WORKSHOPS**

October 2009

10/15 Rocky Mountain: Water/Gas Shutoff and Conformance Control - Knowing What To Do/Where - Casper, WY.

10/20 Texas/SE New Mexico: What Is Your Bottom Line (Midland College PPDC) - Midland, TX.

10/20 West Coast: Property Taxes - Long Beach, CA.

10/21 West Coast: Property Taxes - Bakersfield, CA.

10/27 Rocky Mountain: Chemical Enhanced Oil Recovery - Golden, CO.

10/27 Midcontinent: Fundamentals of Waterflood Design - Wichita, KS.

10/28 Midcontinent: Waterflood Systems and Operations - Wichita, KS.

November 2009

11/10 Texas/SE New Mexico core workshop: Sequence Stratigraphy, Depositional Systems, and Production Trends in the Atoka Series and Mid-Pennsylvanian Cleveland and Marmaton Formations, Western Anadarko Basin (Ellison Miles Geotechnology Institute, Texas Bureau of Economic Geology) - Farmers Branch, TX.

11/10 Rocky Mountain: PETRA, Intermediate Mapping - Golden, CO.

11/12 Rocky Mountain: GeoGraphix Training, Overview and Refresher - Golden, CO.

11/19-20 Rocky Mountain: Applied Hydrodynamics in Petroleum Exploration & Production - Golden, CO.

For further information, view PTTC's online calendar at www.pttc.org/national_calendar.htm

Time to upgrade?

Active Membership Has Its Privileges

By AMY MOSS-RUSSELL
and WILLIAM DRAKE

AAPG Young Professionals Committee

Did you know that if you have Student or Associate status in AAPG, then you aren't technically a "full member" of AAPG?

Most young professionals in AAPG fall within the Associate category, although they likely qualify for Active membership as a practicing geoscientist. In fact, there are currently over 5,000 Associates who qualify to become full-fledged Active members!

Unfortunately, many students transition to Associate status but, for one reason or another, do not follow through to Active membership.

One of the commitments of the AAPG Young Professionals Committee is to guide our Student members to Associate status upon entry to the professional world – and ultimately on to Active membership. As a growing number of students and young professionals make their way into Associate status in AAPG, it is timely to clarify the path to Active membership and its benefits.

AAPG currently has five membership classes: Active, Associate and Student members, plus awarded Honorary and Emeritus memberships.

Of note for students and young professionals:

✓ **Active** members must be vetted according to the Code of Ethics and Bylaws. All applicants must meet the following qualifications: hold a degree in geological science; have one year of experience in the practice or teaching of geological science; the support of three sponsors; your name in print as a candidate for Active membership in the EXPLORER; and final approval by the AAPG Executive Committee.

✓ **Associate** status was originally created for those who do not qualify for Active membership. However, it is now the classification for all non-degreed industry professionals, those who work in related fields and those who do not have the required one year of experience.

Applicants must be a university graduate or have adequate professional experience/professional standing. Dues are the same as Active membership.

✓ **Students** are offered a reduced-rate dues program that is available to all students majoring in geology or a related field. This status ends after termination of academic enrollment.

Moving On Up

The transition from Student to Active membership is becoming easier to navigate and is worth pursuing.

Until this June, the experience requirement for Active membership applicants was three years of professional experience as a practicing geoscientist – but the AAPG House of Delegates, at the Denver annual convention, voted to change the AAPG Bylaws to require only one year of professional experience.

This update streamlines the timing for the application process and is a milestone all new professionals can work toward and look forward to when entering their career.

The path to Active membership starts with Students moving to Associate status as they become young professionals.

After the year of professional experience, new professionals are eligible to apply for Active membership. This requires an evaluation process based on adherence to AAPG's strong Code of Ethics as outlined in the AAPG Bylaws and Constitution.

For example, any Active member has 60 days to object to the admission of an applicant once the applicant's name and sponsors are published in the AAPG EXPLORER.

Ultimately the Executive Committee has final say on acceptance of all new Active members.

It Matters

Why should you care if you're an Active or Associate member?

Here's what you stand to gain from becoming an Active member of AAPG:

- ✓ Recognition from your peers as an ethical, practicing geoscientist.
- ✓ Voting rights to participate in AAPG elections – democracy in action.
- ✓ The opportunity to serve within AAPG and give back to your profession.
- ✓ Full involvement – with your own voice – in Association matters.
- ✓ The potential to better open doors in your career.
- ✓ Shaping the present and future face of AAPG – on many levels.

Progressing students and young professionals to Active membership also is undoubtedly beneficial to the AAPG community:

- ✓ We gain the voice of an increasing demographic of young professionals.
- ✓ We increase participation from less-experienced professionals and, therefore, more opportunities for interaction across a range of experience levels.
- ✓ We gain earlier personal investment in AAPG by future decision makers.
- ✓ We reduce the numbers in the "in-between" category of Associate.

The difference between Active and Associate status does not involve dues – and since the Bylaws have changed to a graduated dues system, becoming an Active member is easy and equitable.

The process of vetting candidates to Active membership takes time to complete – up to five months in some cases – but there has been effective steps taken to streamline the process. For starters, the Active membership application is now available online, at www.aapg.org/member/application_active.cfm.

As Scott Tinker often said during his AAPG presidency, the young professionals are not just the future face of our industry – they are the present face of the industry as well. Student and Associate status should be considered transitional stages on the path to Active membership and the opportunity to influence the present face of our industry.

The time to make the jump to fully vested Active membership is now!

(Editor's note: Amy Moss-Russell is a graduate student at the Colorado School of Mines and a new hire at Chevron North America in Houston. William Drake is a geologist with Pioneer Natural Resources in Denver.) □

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, or by contacting headquarters in Tulsa.

For Active Membership

California

Gaudet, Marieke, Occidental Oil and Gas, Long Beach (S.W. Prior, D.D. Clarke, C.P. Henderson); **McMahan, Justin Chance**, Occidental Oil and Gas/Vintage Production California, Bakersfield (W.M. Satterfield, S.A. Reid, S.A. Gordon)

Colorado

Drake, William R., Pioneer Natural Resources, Denver (H.H. Macartney, D.E. Sanders, J.J. Krneck); **James, Charles Pritchard**, Positive Exploration Solutions, Highlands Ranch (G.S. Hinds, D.G. Neese, N.M. Houghton)

Indiana

Allison, Dennis Alan, Energy Investment Partners, Lynnvill (reinstatement); **Phillips, Erika Michelle**, Brookston Resources, Newburgh (J.E. Williams, J.B. AmRhein, J. Coffroth)

Montana

Bush, Debbie A., D.A. Bush Geologic Consulting, Stevensville (D.L. Brimberry, W.B. Freisatz, C.J. Murray)

Pennsylvania

Bowman, Douglas Craig, Range Resources-Appalachia, Canonsburg (W.A. Zagorski, C.C. Moyer, B.T. Hina)

Texas

Erich, Jennifer M., ExxonMobil, Houston (W.L. Merz, D.W. Blaisdell, J.S. Campbell); **Gifford, Graham**, GETECH, Houston (G.L. Thompson, M.A. Kidwai, O. Geisler); **Johnston, Paul J.**, BP America, Houston (D.G. Derbecker, B. Wagner, M. Albertin); **Kiester, Jeffrey Allen**, Devon Energy, Tomball (reinstatement); **Ondrus, Amy**, Marathon Oil, Houston (D.L. Brimberry, W.D. Zogg, S.W. Rushworth); **Oyebode, Olaniyi**, Terrasond, Houston (J.L. Weller, T.A. Cloud, N. Omorodion); **Taylor, W. Lansing**, IGEOSS, The Woodlands (B.R. Frost, W.K. Camp, L.C. Meibos); **Zamfes, Konstandinos**, Prospectors Services International, Katy (D.A. Walker, C.J. Donofrio, E. Hasanoff)

Australia

Healy, David, University of Aberdeen, Perth (R.R. Hillis, N. Kuszniir, S.G. Archer)

Brazil

da Silva, Roberto Rosa, Petrobras, Rio de Janeiro (F.J. Feijo, A.B. Franca, L.P. Magnavita); **Gilaberte Bezerra**, Sabrina Helena Diniz,

Petroleo Brasileiro S.A., Rio de Janeiro (M.R. De Castro, A.B. Franca, F.J. Feijo)

Canada

Weyer, Klaus Udo, self-employed, Calgary (J.R. Unterschultz, R.V. Scheerhorn, R.J. Finley)

Colombia

Laverde, Fabio Enrique, Schlumberger, Bogota (V.O. Ramirez, F.H. Audemard, M.A. Cortes)

England

Freeman, Stephen Robert, Rock Deformation Research, Leeds (R. Knipe, A. Li, R.K. Davies); **Grimmer, Joerg O.W.**, BG Group, Reading (J. McQuilken, J. Pironon, J.D. Argent); **Harris, Simon David**, Rock Deformation Research, Leeds (R. Knipe, R.K. Davies, A. Li); **Turner, Jonathan Paul**, BG Group, Birmingham (reinstatement)

India

Choudhuri, Mainak, Reliance Industries, Navi Mumbai (N. Sinha, S.P. Sharma, M. Nemcok)

Sinha, Sudipta Tapan, Reliance Industries, Navi Mumbai (N. Sinha, S.P. Sharma, M. Nemcok)

Nigeria

Amu, Marcel Ogbonna, NNPC-NAPIMS, Lagos (M.D. Bako, E.O. Olopade, C.P. Okoro); **Iwuoha, Sochi Chiuwike**, Total (EPNL Port Harcourt), Port Harcourt (H.D. Johnson, G.J. Hampson, G.O. Oboh); **Ukachukwu, James Chijioke**, Chevron Nigeria, Lagos (G.O. Agunwoke, A.F. Soetan, A.R. Ojelabi)

Norway

Sunde, Kjell, Statoil-Hydro, Oslo (J.C. Rui, O.J. Martinsen, F. Hadler-Jacobsen)

Pakistan

Adhami, Asad Mumtaz, Pakistan Petroleum, Karachi (M.Z. Khan, S.M. Raza, A. Kamran)

Peru

Bocanegra, Jorge Fernando, Interoil Peru S.A., Comas-Lima (H. Valdivia-Ampuero, V.R. Sanz, H. Cornejo)

Republic of Singapore

Oliver, Grahame John Henderson, National University of Singapore, Singapore (I.D. Collins, P. F. Worthington, J.J. Lambiase)

Saudi Arabia

Abdel Kader Hassan, Khaled, Saudi Aramco, Dhahran (A.M. Afifi, R.M. Bridle, J.W. Tucker)

Scotland

Currie, Alan Thomas, Melrose Resources, Edinburgh (R. McKeen, J.B. Blanche, J.R. Underhill); **Rohrman, Suba D.**, Schlumberger SIS, Aberdeen (J. Basche, R. Chambers, J. Yarus)

Spain

Gomez-Rivas, Enrique, Universitat Autònoma de Barcelona, Bellaterra, Barcelona (A. Teixell, S.M. Agar, A. Permanyer)

United Arab Emirates

Al-Harthy, Mohamed Salim, Shell EP International, Dubai (S.W. Tinker, A.M. Afifi, P.O. Yilmaz)

Certification

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

Petroleum Geologist

Kentucky

Lawrence D. Wells (R.F. Vogt, J.M. Kincheloe, J.A. Drahovzal)

Texas

Angel F. Curet (S. Rector, F. Corona, T. Frantes); **Matthew D. Gentry** (D. Sacrey, J. Aubrey, H.C. Ferguson); **Loren M. Toohey** (J.M. Party, J. Adams, A. Carleton, G.P. Bolden); **Chandler T. Wilhelm** (D.J. Tearpock, D.N. Malouta, A.R. Bay); **Yanqing Yu** (C. Griffith, J. Yu, M. Cisar)



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READERS' forum

Gas Yes, Barriers No

I read "Gas has a big future ..." in the August EXPLORER with great interest. My question however, is whether the natural gas potential of the areas and plays discussed will be sufficient for our need.

If the "right" decisions are made in Washington, D.C., and elsewhere, the United States will depend primarily on domestic gas for the next few (or several) decades. I use the term "right," because natural gas is the obvious domestic fuel that will carry us into the promised age of alternative energies – and which will do so while helping to cure the country's economic ills. I see natural gas as a tremendous opportunity for America.

I am getting to be an old-timer, and I recall that two informational wells were drilled into the continental shelf off the U.S. East Coast in the early 1970s. Technology of the time demonstrated that the area is a gas province. Today, oil and gas are being produced at the Hibernia field off the coast of Newfoundland, Canada.

There can be little doubt that this country needs to overcome political blockage, and to explore and develop this potentially prolific natural gas province. I understand that the outer continental shelf has been opened to exploration, but it is a no-brainer that the near-shore region must be explored and developed first in order to better understand the area beyond it.

Furthermore, the eastern Gulf of Mexico is an extension of a known oil and gas province that has provided energy to this country since early in the 20th century. Most of province's offshore area is under a moratorium to leasing until 2012.

It is imperative that the region's petroleum and natural gas potential be realized ASAP. The significance is not only energy. Domestic energy is an essential element of national economics, to say

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.

nothing of national security.

I have laughed at politicians who expounded about "energy independence" for the last 35 years; however, I believe that we can now decrease our consumption of imported oil – and LNG as well. Domestic natural gas and new technologies can make that possible:

- ✓ Use more natural gas for motor transportation ("the Pickens Plan").
- ✓ Build refineries to produce diesel from natural gas (GTL).
- ✓ Develop wind generation (onshore and offshore) to the maximum extent possible.

This is not to ignore energy conservation or any of the promising new technologies. If we do not take advantage of all of these opportunities, I fear that the country will sink into economic oblivion.

But we must overcome the political barriers to progress!

The advantages to the citizens of the eastern and southeastern states also are clear: The development of natural gas could mean less traffic of supertankers (the major cause of oil spills), as well as eliminating the fuss about where to place import facilities for LNG.

I hope that all of you – especially those of you on or near the East Coast – will contact your senators and congressmen as well.

Jock A. Campbell
Norman, Okla.

A correction for the story in the September EXPLORER on public distribution of an earth science pamphlet (page 12) arrived after deadlines and was unable to be made in the print version.

The phrase "ESLI has produced ..." should have read, "the NSF has sponsored ..."

(Editor's note: Campbell is geologist emeritus with the Oklahoma Geological Survey.)

Fossil Fuels Still the Best

Fossil fuels (oil, gas and coal) constituted the prime source of energy used in building our great nation – AND fossil fuels should and will provide the energy necessary to recover from our current economic mess now ravaging our nation. Why?

No other energy source (alternatives) can compete cost-wise; plus the infrastructure is in place to deliver fossil fuel energy to the consumer, thus voiding the high cost of new infrastructure required to deliver energy from alternatives.

While alternatives (wind, solar, nuclear, etc.) will some day supply needed energy, that day may be two or three generations from now, as the world has enormous amounts of fossil fuel remaining to be discovered.

Our current fragile economy does not have the financial capital necessary to research and develop sensible alternatives at this time. The current energy debate is considering a myriad of energy alternatives, many of which ignore reality of the situation. Myths abound in this area, and if left unchallenged they may well result in adoption of a flawed and economically damaging energy policy.

The scientific community is widely divided on cause-and-effect of several energy related issues; i.e. climate change, CO₂ generation (man or nature), ethanol, etc. Until resolution of these differences is achieved it would seem wise to continue with dependence on fossil fuels for our primary source of energy.

The solution to our nation's current energy problems must mitigate dependence on sources outside North America and avoid foolish and expensive alternatives. Free our strong oil and gas industry from punitive taxation and allow them access to explore for and produce oil and gas in areas heretofore banned, i.e. east and west U.S. offshore, federal lands and ANWR.

Congress, without further delay, should open these areas for exploration and development. Time is of the essence.

Dick Baile
Houston

Curtailed, or 'Curtailed'?

I know that being an editor is not easy, but I have concerns about one phrase from the article "No Recession for the Haynesville" (July EXPLORER). In paragraph seven the reporter writes, "The company has curtailed its production for now."

I am not a Chesapeake share holder or employee, but I really have doubts that they are curtailing production by any means other than natural decline of the existing producing wells. I expect such misuse of language from the press in general but not from a professional journal.

If I had a dollar for every time I have had to explain the principle of production decline to friends and neighbors I would be a rich man!

Ted Winzeler
Houston

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R&S

from page 42

to become "Actives."

The experience of these latter years tells us that the way to achieve more industry involvement and membership growth is to recapture all the positives we enjoyed as the AAPG went international at the turn of the millennium:

✓ We must expand our overseas office infrastructure and differentiate AAPG regional offices from the many excellent local and regional society offices that also have come into being in the last 10 years.

✓ We must leverage off the greater experience the AAPG has domestically with certification, environmental geoscience, non-conventionals and renewables – and export this experience to the Regions. The Visiting Geoscientist

Program, Distinguished Lecture, education, Hedberg and Geoscience Technology Workshop programs all are tried and trusted offerings where the AAPG gives value added to our members.

✓ We must continue to empower the joint HQ-volunteer teams who work our overseas offices to tailor AAPG products and services to meet the local setting.

✓ We must reconnect and partner with all our international affiliates; they are just as important to the Regions as they are to the Sections domestically.

✓ Most importantly, we must appreciate that successful globalization requires each of us to be sensitive, sympathetic and appreciative of the wide range of overseas cultures, by striving to complement, not control, when working in such settings. □

(Editor's note: Peter Lloyd and Marty Hewitt are co-chairs of the International Regions Committee, and members of the HoD Constitution and Bylaws Committee.)

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SEDIMENTARY GEOLOGIST and ENERGY GEOCHEMIST

The Department of Geology and Geography at West Virginia University seeks to appoint two new faculty positions addressing expanded energy research efforts associated with the WVU Advanced Energy Initiative (ruby.geo.wvu.edu/~tcarr/AEI_page.html). Specialty in sedimentary geology is open and may include, but is not limited to: physical stratigraphy; sedimentary deposits, processes and systems; and basin studies on outcrop and in subsurface, plus we value a willingness to help teach Geology Field Camp. The geochemical specialty is open and may include, but is not limited to: geomicrobiology, isotope, organic, and trace element geochemistry. For both positions a focus on energy resources is expected. The successful applicants will contribute to teaching at the undergraduate and graduate levels. Teaching excellence and development of a vigorous externally-funded research program are required. The Department is located in an outstanding newly renovated building. Visit www.geo.wvu.edu/files/sedgeolchem.pdf for a full description of the positions and how to apply. Review of applications will begin November 1, 2009 and will continue until the positions are filled. The anticipated start date is August 16, 2010. Please see www.geo.wvu.edu, www.wvu.edu, and www.morgantown.com for additional information. West Virginia University is an Equal Opportunity/Affirmative Action employer. Women and minority candidates are encouraged to apply.

ASSISTANT PROFESSOR STRUCTURAL GEOLOGY

The Boone Pickens School of Geology at Oklahoma State University (OSU) seeks applications for a tenure-track faculty position in the broad area of structural geology. We are particularly interested in someone with interest in one or more of the following research areas: structural analysis of petroleum reservoirs, basin evolution, continental tectonics, neotectonics. The appointment will be at the assistant professor level and effective August 2010. The applicant is required to have a Ph.D. degree in geology or related field at the time of appointment. The applicant must show promise of an outstanding research program and be committed to excellence in teaching. The successful candidate will be expected to supervise M.S. and Ph.D. level graduate students and develop courses in her or his specialty. In addition she/he will participate in teaching introductory geology courses and teach a core geology curriculum course in structural geology. The successful candidate will join a faculty of eleven geoscientists and will be part of the sedimentary geology, petroleum geology, and tectonics research groups that include six other faculty and has close ties to the petroleum industry. In addition to other research facilities the School of Geology has the Devon Teaching and Research Laboratory, which contains state-of-the-art 3-D image processing facilities.

Candidates should submit a letter of application, including a discussion of research interests and approach to teaching, along with a curriculum vitae and the names, addresses, e-mail addresses, and phone numbers of three references to: Assistant

Professor Position Search, Boone Pickens School of Geology, 105 Noble Research Center, Oklahoma State University, Stillwater, Oklahoma 74078-3031, Phone: (405) 744-6358, Fax: (405) 744-7841. Inquires about this position may be directed to Dr. Todd Halihan (todd.halihan@okstate.edu) or Dr. Jay Gregg (jay.gregg@okstate.edu) at the above address. Screening of candidates will begin December 31, 2009 and continue until the position is filled. Filling of this position will be dependant on the availability of funding.

More information on OSU and the Boone Pickens School of Geology can be found on the web <http://osu.okstate.edu> and <http://geology.okstate.edu> respectively. Committed to health and safety Oklahoma State University maintains a tobacco free work environment. Oklahoma State University is an Affirmative Action/Equal Opportunity/E-Verify employer committed to diversity.

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THE PETROLEUM INSTITUTE ABU DHABI, UNITED ARAB EMIRATES

Institution: The Petroleum Institute (PI) in Abu Dhabi, United Arab Emirates was created in 2001 with the goal of establishing itself as a recognized institution in education and research in areas of significance to the oil and gas and the broader energy industries. The PI's sponsors include the Abu Dhabi National Oil Company and four major other international oil companies, namely BP, Shell, Jodco, and Total. The Institute is affiliated with and has collaborative programs in place with the Colorado School of Mines, the University of Maryland at College Park, the University of Minnesota, and Leoben and Linz Universities (Austria). For more information, please refer to the PI website: www.pi.ac.ae.

FACULTY POSITIONS - PETROLEUM GEOSCIENCES

The Petroleum Geosciences Department at the PI is seeking applications for the following positions:

Chaired Professor, Distinguished Professor Professor, Associate Professor, Assistant Professor Research Associate

Program faculty will be expected to teach undergraduate and graduate courses, develop an active research program, and to engage in professional and institutional service activities. Opportunities to interact with PI industrial stakeholders and other local industries will be a key feature in the development of a research program.

Interested candidates should submit all materials online:

www.pi.ac.ae/jobs

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DIRECTOR'S corner

Books Continue Legacy of AAPG

By RICK FRITZ

While checking on potential quotes for my column I was amazed at how many quotes were made about books. For example, Martin Luther said, "Every great book is an action and every great action is a book."

Then there is a Chinese proverb that says, "A book is like a garden carried in your pocket." I am not sure exactly what that means but I like it.

My favorite quote on books was by Lord Byron, who said, "A drop of ink will make a million think!"

That fits exactly with AAPG's goal to disseminate science.

This year you will have a tremendous opportunity to examine a portion of the treasury of knowledge provided by some of the top geoscientists in the world. The following is a list with a brief description of four key special publications that will soon be available:

✓ **Advances in the Petroleum Geology of Mexico** – Editors: Claudio Bartolini and J.R.R. Ramos (co-published with Repsol YPF and PEMEX).

This special publication contains 20 chapters covering onshore and offshore Mexican basins of the circum-Gulf of Mexico. Most of the chapters have a multidisciplinary approach, with special emphasis on hydrocarbon exploration



Fritz

and petroleum geology.

It is an incredible new look at the geology and petroleum potential of Mexico.

✓ **Natural Gas Hydrates – Energy Resource Potential and Associated Geologic Hazards** – Editors: Tim Collette and Art Johnson, C. Knapp and R. Boswell (co-published with the U.S. Department of Energy, EMD and AAPG Foundation).

This title evolved from the results of an AAPG Hedberg conference. It is a comprehensive treatise containing 39 printed extended abstracts and 39 full papers on CD on the geology of gas hydrates, focusing on resource assessment along with other significant papers on gas hydrate related geologic hazards.

✓ **Oil Field Production Geology** – Mike Shepherd.

This special publication is written for students, new professionals in oil companies and for anyone with an interest in reservoir geology.

Forty chapters explain the background to production geology in the context of oil field subsurface operations. It also gives practical guidelines as to how a production geologist can analyze the reservoir geology and fluid flow characteristics of an oil field with the aim of improving hydrocarbon recovery.

✓ **CO₂ Sequestration in Geological Media – State of the Science** – Editors:

Matt Grobe, J.C. Pashin and R.L. Dodge (co-published with EMD, DEG, the Bureau of Economic Geology and the AAPG Foundation).

This is a comprehensive geological analysis of carbon sequestration. Its 43 chapters present a compilation of state of the science contributions from the international research community on the topic of carbon dioxide sequestration in geological media, also called geosequestration.

* * *

AAPG has a rich history of developing special publications. On the bookshelves in my office is a set of every AAPG special publication. The very first special pub is titled "Geology of Salt Dome Oil Fields," by E. DeGolyer and "Others." The second is titled "The Theory of Continental Drift," by W.A.J.M. van Waterschoot van der Gracht, published in 1928! It is the results of an early AAPG "workshop." Even in our early history our members were thinking outside the box.

The first publication on salt domes has some classic papers and a great forward by Wallace Pratt, who writes:

"Much of the speculation as to the origin of salt domes especially in America, appears to be unsound, and the error results from an inaccurate of distorted conception of the true form and character of our salt domes. It is hoped that with a more accurate, more detailed picture of American salt domes, such as this volume attempts to present, students

of salt-dome origin may clarify and bring into accord their several theories."

In his forward Pratt describes the goal of AAPG in developing special publications: We want to publish more so we ask all members to consider this opportunity to "clarify and bring into accord your several theories."

Terri Olson is the chair of the Publications Committee, and they are constantly looking for new proposals for special pubs. You can send inquiries to Beverly Molyneux at Molyneux@aapg.org.

I am even getting into the act. Ten years ago the late Dr. James Lee Wilson, a Sidney Powers medalist, and I conspired to develop a comprehensive special publication on the Cambro-Ordovician carbonates of North America. As a memorial to Jim, his many friends, colleagues and students plan to have "The Great American Bank: The Geology and Petroleum Potential of the Cambro-Ordovician Sauk Sequence of Laurentia" to print this fall.

* * *

Sir Francis Bacon said, "Some books are to be tasted, others to be swallowed and some few to be chewed and digested."

Now is the time to take a new look at AAPG special publications – at least for a taste.

AAPG materials distributed

Legislator Confab Is Educational

By PAUL W. BRITT
DPA President

The National Conference of State Legislatures (www.ncsl.org) was held in July this year in Philadelphia, and as DPA president I had the opportunity, along with GEO-DC Director David Curtiss and Don Juckett, to represent the AAPG.

It was a fascinating experience. The exhibit hall was smaller than the AAPG annual convention's exhibits, but about the size of the larger AAPG Section meeting exhibits.

That's where the similarity ended.

The booths were filled with organizations, associations, companies and groups representing a reasonably large cross-section of American industry, professions, vocations, interests and hobbies. Next to our booth was the Federation of State Boards of Physical Therapy, and throughout the hall were groups representing toy manufacturers, car manufacturers, food and beer makers and distributors, auto repair associations, humane and animal protection groups, health providers, health insurers, pharmaceuticals, women's groups, travel groups, massage therapists, gun manufacturers, gun control advocates, the NRA, PITA, Red Cross and even the American Association for Nude Recreation.

The talks featured a similar cross-section of topics, and when the attendees were not in talks, they visited the exhibits hall.



Britt

It gave me an appreciation of the cacophony of issues that legislators at all levels are subjected to. And their staffs are expected to sort out and rank the importance of issues from the inundation of information – from

literally hundreds of groups with different interests and agendas, sometimes in direct opposition to one another. Trade/labor versus industry, industry versus consumers, and so on.

We had a number of state legislators stop in the booth, and all who stopped were supportive – some from states that had oil and gas production, and some that wanted more oil and gas production in their state. A notable number of foreign legislators also were at the conference, from Africa, India, Southeast Asia and elsewhere, and many of those stopped by as well.

We distributed AAPG materials, and showed AAPG and other publications that could be useful to them.

Probably because the conference is held in the summer, a surprising (at least to me) number of educators and teachers also attended. This presented a great opportunity to put the AAPG in front of educators

from all over the country.

This conference is the only concentration of state legislators where the AAPG has an opportunity to get in front many lawmakers in one place. The alternative is to visit many of the state capitals, which is a prospect well beyond the scope and budget of the AAPG – unless the AAPG membership was to get involved.

We are working on possible plans to enable AAPG and DPA members to contact their state legislators to get education of earth science and geology to them, so that the lawmakers can have better access to scientific knowledge in the law-making process.

And this is not limited to U.S. legislators. Non-U.S. AAPG members also could get involved, bringing education of earth science into the law making process wherever AAPG has a presence.

If you have any interest or ideas in this issue, please feel free to contact me.

* * *

As an update to the July 2009 EXPLORER column regarding the DPA Town Hall meeting in Midland, Texas, the DPA is currently processing 19 new applications for membership.

And a correction to that issue is in order: A Gulf Coast councilor, Chacko John in Baton Rouge,

La., was left off the list of officers, and Al Baker, New Orleans, is an alternate councilor.

* * *

The Joint Committee On Petroleum Reserves Evaluator Training (JCRET) is a four-society committee (AAPG, SPE, SPEE and WPC). Each society must appoint three members to JCRET. They serve two-year terms.

The DPA is looking for members interested in serving on this committee.

For more information, please contact DPA President-elect Dan Tearpock.

DPA Web Site News

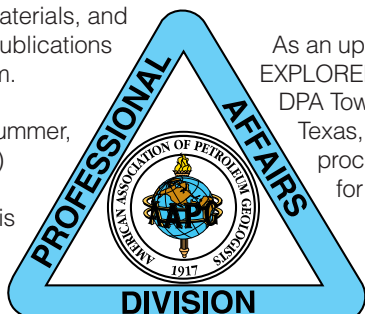
The first in a series of the ethics courses and examinations is now online.

"The Ethics Storybooks with Tales from the Oil Patch," by John Gibson, is a video that takes about an hour to complete, including questions that follow.

Watch the video as many times as you like. Successfully completing the questions qualifies each person for one Professional Development Hour that can be applied to a state license requirement for ethics.

The course is available to anyone.

Also available on the DPA page on the AAPG Web site is a new AAPG position statement on geologic carbon storage that "urges the expansion of funding for scientific research on permanent carbon storage and for the scientific research related to reservoir performance." □



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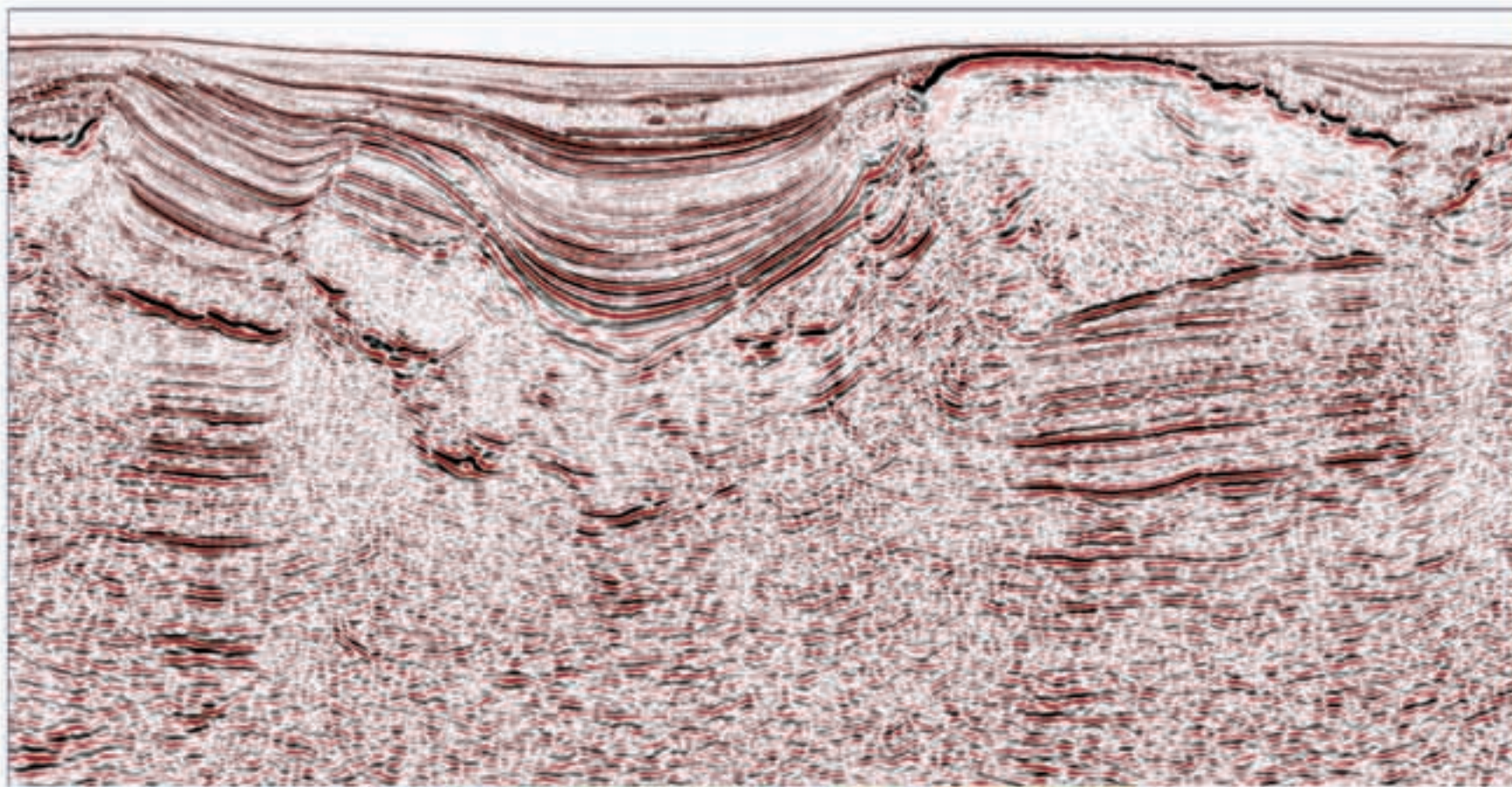


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