AAPG AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, AN INTERNATIONAL ORGANIZATION

EXPLORER

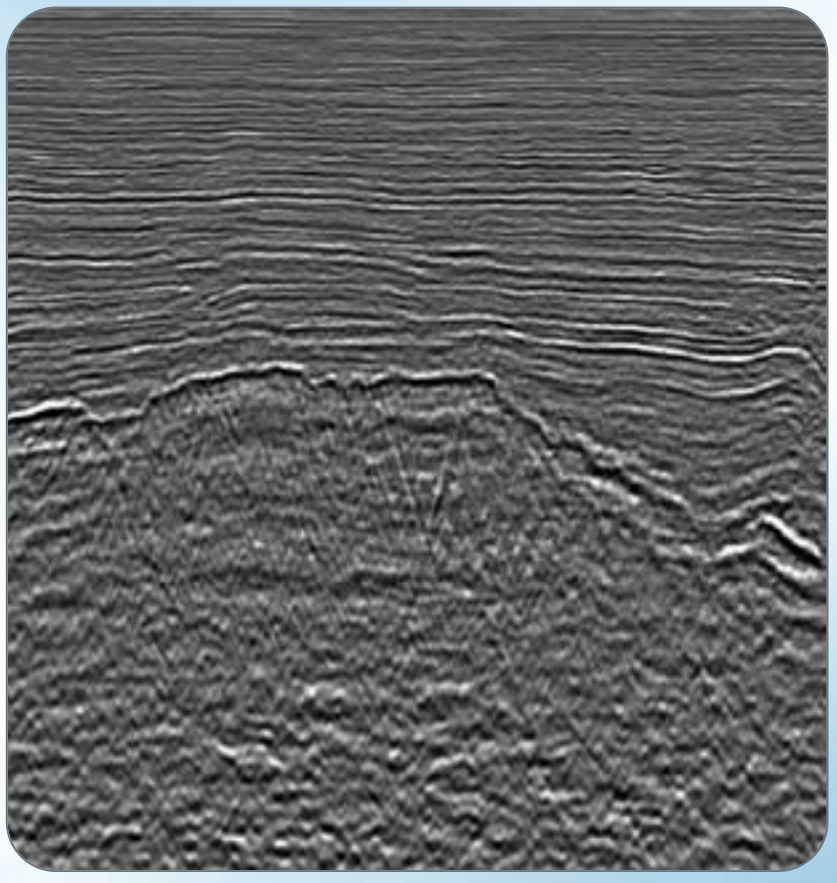
MAY 2009

Magnificent
Canada's Burgess Shale

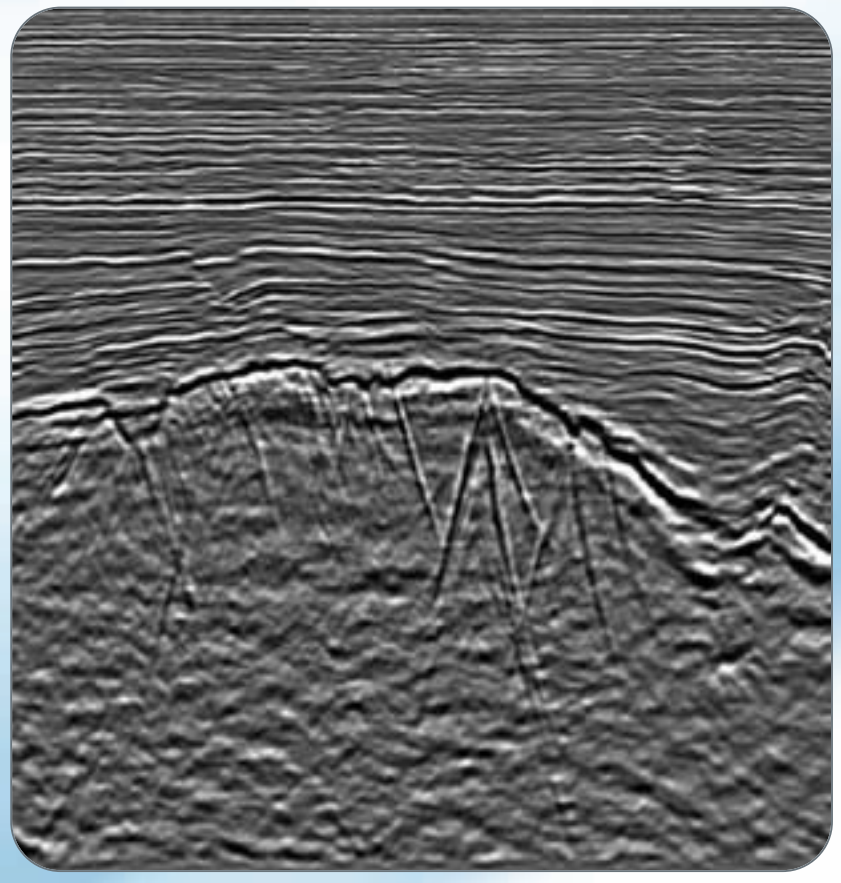
Vol. 30, No. 5
May 2009

AAPG EXPLORER

Commitment to the Very Core



Kirchhoff PSDM section.



Controlled Beam PSDM section.

CHALLENGE

- To image the oil-bearing fracture zones in a complex granite basement reservoir offshore Vietnam where conventional methods fail to produce convincing results.

SOLUTION

- The data was reprocessed using the CGGVeritas Controlled Beam Migration algorithm for the velocity model building and the final migration.

RESULTS

- Based on the new CBM images, the operator was able to confidently carry out a successful drilling campaign to develop the reservoir.

CGGVERITAS

cggveritas.com

On the cover: Geologists have known about it for decades, but now the rest of the world is being invited to the party – the year-long celebration of the 100th anniversary of the discovery of the Burgess Shale is about to begin. Shown here are geologists at the Burgess Shale's Walcott Quarry, a site that has been called "Mecca for paleontologists" because of its treasure trove of fossils. It's located in Yoho National Park in British Columbia – a park that is itself a cathedral to geologic splendor. See story on page 20; photo courtesy of Jon Dudley.

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Vol. 30, No. 5
The AAPG EXPLORER (ISSN 0195-2986) is published monthly for members. Published at AAPG headquarters, 1444 S. Boulder Ave., P.O. Box 979, Tulsa, Okla. 74101, (918) 584-2555. e-mail address: postmaster@aapg.org
Periodicals postage paid at Tulsa, Okla., and at additional mailing offices. Printed in the U.S.A.
Note to members: $6 of annual dues pays for one year's subscription to the EXPLORER. Airmail service for members: $55. Subscription rates for non-members: $75 for 12 issues; add $72 for airmail service. Advertising rates: Contact Brenda Merideth, AAPG headquarters. Subscriptions: Contact Veta McCoy, AAPG headquarters. Unsolicited manuscripts, photographs and videos must be accompanied by a stamped, self-addressed envelope to ensure return.

POSTMASTER: Please send address changes to AAPG EXPLORER, P.O. Box 979, Tulsa, Okla. 74101.
Canada Publication Number 40046336.
Return undeliverable Canadian address to:
P.O. Box 503 • RPO West Beaver Creek • Richmond Hill, ON L4B 4R6

Photo courtesy of Denver Visitor and Convention Bureau

A chance to hike in the Gore Range near Denver is just one of the reasons to attend this year's AAPG Annual Convention and Exhibition. Need more reasons? Check out the Director's Corner on page 50 – and start making your plans now to head to Denver.

PRESIDENT'Scolumn

Lesson Learned? We Are Needed

By SCOTT W. TINKER

I often learn the most important lessons when I am least prepared and from those most unexpected.

* * *

On March 23, students and faculty advisers representing the AAPG student chapter at Khon Kaen (KK) University in northeast Thailand rode five hours on a bus to meet our small AAPG presidential delegation in the offices of PTTEP, a major national oil company headquartered in Bangkok, Thailand.

The KK students, many of them female, presented with pride a short video about their university and geology department. We then engaged in conversation about their experiences and perceptions.

I made a presentation later that evening to about 100 folks comprising staff from PTTEP, Chevron, a few smaller companies and independents, and the KK students. The talk ended around 7:30 p.m., and the students then got on the bus for the five-hour drive home. I was a bit awed by their dedication.

At the end of the session, the president of the Khon Kaen AAPG student chapter, a young woman, said, "Dr. Tinker, we seek your help."

What help was the student leader looking for?

Not money, equipment or other "stuff."

Tinker

Instead, she was in search of access to AAPG geoscientists for her university, as in Distinguished Lecturers or speakers in our Visiting Geoscientist Program, and training such as workshops, short courses and field schools.

Essentially, she was asking the largest professional association of geoscientists in the world to help Khon Kaen University, in remote northern Thailand, become globally relevant.

Khon Kaen University is not unique. I have been fortunate during the past year to visit with faculty and/or students from universities in Malaysia, Scotland, England, Russia, Poland, Germany, China, Nigeria, Oman, Saudi Arabia, Kuwait, U.A.E. and South Africa. Although culture, language, facilities and instruction vary, the sentiment is consistent:

"Dr. Tinker, we are striving to learn, grow, expand and globalize. We want to matter."

* * *

The world is changing. Change does not always happen quickly, but the pace of change can be accelerated by crisis. The

See **President**, next page

AAPG Voting Deadline is May 15

Time is running out for those who have yet to vote for AAPG officer candidates.

Balloting for the 2009-10 term will continues to be available online until the voting deadline May 15, at 11:59 p.m. CDT.

Election winners will be announced in the June EXPLORER.

While electronic balloting is available to all members a paper ballot also will be sent.

Survey and Ballot Systems, which handles the AAPG election, has a coded system where only one ballot per person is counted, with the paper ballot taking precedent if both are submitted.

Candidate biographies and individual information continue to be available online at www.aapg.org.

The president-elect winner will serve as AAPG president in 2010-11. The terms for both vice president-Regions and secretary are two years.

The slate is:

President-Elect

❒ **Donald D. Clarke**, geological consultant, Lakewood, Calif.

❒ **David G. Rensink**, Apache Corp., Houston.

Vice President-Regions

❒ **Adekunle A. Adesida**, Shell Petroleum Development, Nigeria.

❒ **Alfredo E. Guzman**, consultant, Veracruz, Mexico.

Secretary

❒ **William S. Houston**, Samson, Denver.

❒ **Peter MacKenzie**, MacKenzie Land & Exploration, Worthington, Ohio. ❑

Career Choices: Making Geology Fun

Can a student's life be changed in seven minutes? AAPG has a creative way to find out, thanks to a new PowerPoint show – complete with musical soundtrack – called "Why Geosciences?" created by Joanne Billingsley (wife of past AAPG president Lee Billingsley) specifically for junior high and high school students, to encourage and promote careers in the geosciences. The presentation is available free of charge, and can be found online at www.aapg.org/k12resources/GeoscienceExplained.cfm.

President

from previous page

world is in a global recession; some call it a crisis. There is a new leader in the United States, a leader who has ignited hope in the world. President Obama, in a very short time, has become larger than life on the global stage. I know; I have seen the reaction personally on several continents.

Do the times make the person or does the person make the times? Perhaps some of each. Regardless, in these energy "times" the political dialogue is about non-fossil energy – "green energy" and "green jobs." Substantial investments are being considered, to attempt to accelerate the pace of energy change.

Those in the fossil fuel industry could feel threatened, hunker down, retrench and resist. Many would understand such a reaction. In fact, when I go to Washington, D.C., I often have to convince my "fossil-fuel" self to get off the airplane!

But these feelings are fleeting, because I have seen a world that remains massively engaged in fossil fuels. I see young geologists in universities around the globe beginning to recognize that applied geosciences matter now more than ever. I see "national" oil companies – those owned in large majority by the state – fast becoming "international" oil companies, and international oil companies – struggling under the weight of misguided Western policies that reflect an under-informed energy public.

* * *

I have never met a petroleum geoscientist who believes that the supply of oil is infinite. To most geoscientists, it is not a question of *whether* there will come a day when fossil fuels will no longer be combusted as a source of heat energy. Instead, the question is *when* that day will come – and which form(s) of energy have the capacity to replace fossil fuels.

Most geologists also recognize that day may not be soon, because oil resources far exceed proven reserves, conventional and unconventional natural gas resources could exceed 30,000 TcF (not including hydrates!) and then there is coal.

Resource geoscientists and engineers understand that fossil fuel reserves increase with technology, price and understanding. We also understand the time, cost, technology and new invention required to transition to energy alternatives that have the capacity to meet the required scale of global energy demand.

So instead of hunkering down, we must square our shoulders, get off the metaphorical airplane and become part of the solution.

* * *

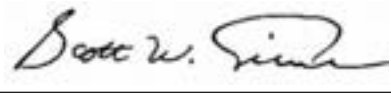
What lesson did I learn from the student in Thailand?

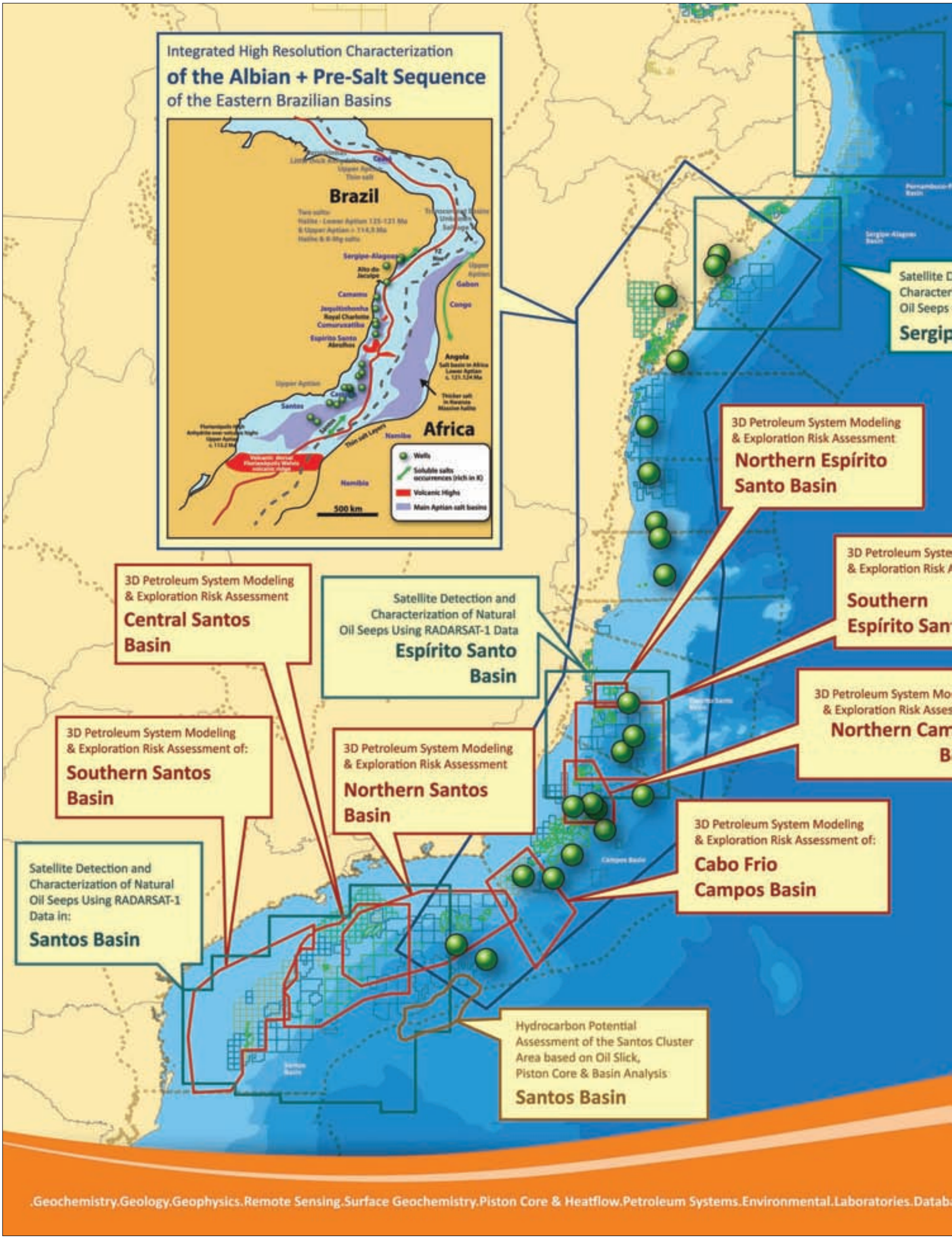
I learned that young people around the world are desperate to do something that matters. They need me, they need us, to share our experience and to impart our collective knowledge.

They need us to educate the world to the reality that energy transitions take time, efficiency is vital and a stable supply of fossil fuels is the bridge to an alternative energy future.

They need us to embrace change and lead them into the future. Their future.

That is a powerful lesson indeed.




Integrated High Resolution Characterization
of the Albian + Pre-Salt Sequence
of the Eastern Brazilian Basins
Brazil
Africa
Sergipe-Alagoas
Alto do Jacuipe
Camamu
Jequitinhonha
Royal Charlotte
Cumuruxatiba
Espírito Santo
Abrolhos
Gabon
Congo
Angola
Santos
Namibe
Namibia
Wells
Soluble salts occurrences (rich in K)
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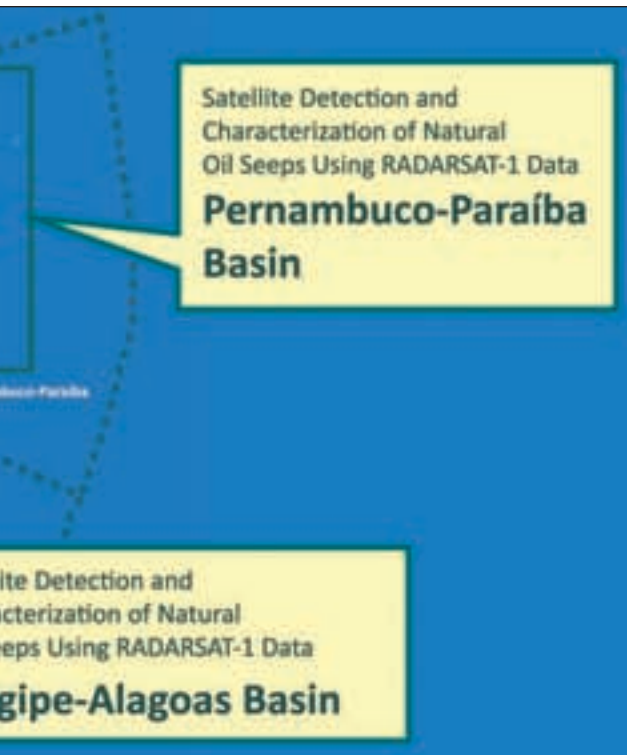

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NEW STUDIES FOR 2009!!!

Multiclient Heat Flow Study of Santos, Campos & Espírito Santo Basins.

Integrated High Resolution Characterizations of the Albian+Pre-Salt Sequence of the Eastern Brazilian Basins

Studies Available:

Petroleum System Summary of Brazilian Offshore Basins.

Petroleum System Summary of Brazilian Onshore Basins.

Temperature of Petroleum Formation from Kinetic Properties of Oils from Santos, Campos and Espírito Santo Basins, Brazil.

Piston Core Geochemical Assessment (Block BM-S-31) Santos Basin Offshore Brazil.

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Integrated data aid decisions

Shale Calls for the Unconventional

By LOUISE S. DURHAM
EXPLORER Correspondent

Natural gas prices in the $3/Mcf-and-under range understandably are causing many operators to scale back on budgets, production and new drilling projects.

Just don't expect this to be a permanent scenario.

The consensus is that once the economy turns around, hydrocarbon demand will make an about-face as well.

The waiting game doesn't necessarily imply wasted time as it offers continued opportunity to delve deeper into potential techniques to better evaluate some of the more challenging and often perplexing plays being explored/produced.

High on this list are the numerous shale gas plays that have sprung to life over the past couple of years in various regions of the country.

Gas shales differ from conventional reservoirs in that they function not just as reservoir rock but also source rock and seal. Economical production from this complex rock demands extensive hydraulic fracturing and often requires horizontal wells.

Successful wells depend on an in-depth understanding of the geology, petrophysics and geomechanics of the particular shale formation. In fact, an integrated approach to shale gas evaluation can be key to conquering the complexities of these rocks to optimize production of the natural gas they hold.

"It's fairly obvious to anyone who works in these plays that conventional methods just don't work," said Duane Sommer, senior petrophysical engineer at Baker Hughes.

> Not all shales are created equal, so there are differing factors that must be taken into account.

Photo courtesy of Range Resources

Marcellus Shale production in the Appalachian Basin: Integrated evaluation can help.

"Our integrated interpretation methodology designed specifically to evaluate shale gas reservoirs focuses on conventional resistivity, neutron, density, advanced acoustic logs," Sommer said, "and we add magnetic resonance, geochemical, geomechanics and borehole image logs to determine an array of information."

That array includes lithology, mineralogy, rock mechanical properties, total organic carbon and gas-in-place in the formation, he added.

Specific Challenges

However, not all shales are created equal, so there are differing factors that must be taken into account.

For instance, borehole imaging is not that important in the high-profile Haynesville shale play because there's no significant fracturing in the Haynesville, Sommer said. In contrast, it's quite important in the Barnett play and some others.

He noted also that in the Haynesville the actual presence of gas is a given, but it presents other challenges:

✓ How to optimize getting that gas out of the ground.

✓ Selecting the best intervals for the completion.

✓ How to implement the frac job to get the best production possible.

✓ Where to place the horizontal leg if going lateral.

The goal with all the shales is to gather all the data possible.

"One of the things we found in the Haynesville, especially, is the intervals

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Shale Gas

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that seem to produce the best and have the most silicious material," Sommer said. "They have more quartz than limestone.

"Part of that is the geomechanics," he explained. "That rock breaks easier – making it easier to frac – so we look at the geochemical logs in combination with the advanced acoustics which we do rock mechanical properties with and look at what intervals will frac easiest."

Identifying the Interval

The next step is to look at some of the standard logs or magnetic resonance to try to get a better idea of porosity. This can vary significantly in different plays, e.g., porosity is quite low in the Barnett but ranges from 8 to 10 percent in the Haynesville, according to Sommer.

"When we put all our information together, first we find which intervals in the well will fracture easiest," he said. "Of those we identify which have the best porosity, which has total organic carbon in or near that interval to supply the gas itself.

"We're trying to pick the interval we think will be most successful for completion," Sommer noted. "If you're going lateral instead of just perfing and fracing, you still want to drill the lateral in that same interval."

The acquired data are presented to the client in a large, wide plot that Sommer likens to a facies curve that shows crucial information such as:

✓ The target type of rock.

✓ A piece of rock that would be a barrier to a fracture.

✓ Rock to stay away from.

"We're trying to make it as simple as possible for someone to look at the well," Sommer said, "and even if they don't understand all the pieces, to be able to say OK, this is where we need to be, where we need to frac, where we need to perf or where to drill our lateral.

"In a nutshell, that's our approach," said Sommer, who noted the overall presentation remains the same even though the individual pieces change from basin to basin.

"The general process," he said, "usually works for all." ❑

Shale Gas Presentations Will Have High Profile in Denver

Photo courtesy of Terry Engelder

Duane Sommer and AAPG member Mitch Pavlovic will present the poster "An Integrated Approach to Shale Gas Evaluation" at the upcoming AAPG Annual Convention and Exhibition in Denver.

The poster presentation will be Tuesday morning, June 9, as part of the EMD session on "Gas Shales Reservoirs – Updates and New Insights II."

Other titles in the session include:

✓ The Middle Devonian Marcellus Shale – A Record of Eustacy and Basin Dynamics.

✓ Marcellus Shale Log Calibration and Mapping With Legacy Logs.

✓ Shale Gas and Shale Oil Resources of the Paradox Basin, Colorado and Utah.

✓ Gas Shale Reservoir Characteristics from the Pennsylvanian of Southeastern Utah.

For more information on the several EMD technical sessions – oral and poster – and other events set for Denver involving shale gas see the EMD column on page 50. ❑

Shale Gas Primer U.S. Data

A primer on U.S. shale gas production, recently released by the U.S. Department of Energy, notes that unconventional production now accounts for 46 percent of total U.S. production.

The 116-page technical summary document, which includes geologic information on the shale gas basins in the United States and the methods of shale gas development, is aimed for a public audience.

The EXPLORER is among the publications cited.

The primer also provides an overview of the regulatory framework and the environmental considerations associated with shale gas development.

It is available via the DOE Web site at www.fossil.energy.gov. ❑

Mentoring in the digital age

Remote Collaboration via Technology

Darrel Fanguy, will present the paper "The Future of Collaboration in the Oil and Gas Industry" at the upcoming AAPG Annual Convention and Exhibition in Denver.

Fanguy's talk is slated for 8:25 a.m. on Monday, June 8, as part of the session on "Discovery Thinking," chaired by Charles Sternbach and Ed Dolly.

> "If you bring a (young geologist) into a big company and put them in an open cubical environment they'll freak out."

By LOUISE S. DURHAM
EXPLORER Correspondent

Remember those big, expensive immersive visualization facilities that became increasingly commonplace beginning in the late 1990s?

They were considered to be the ultimate cool venue for collaborative teams of geoscientists and others to assemble to interact with one another and the data and to share knowledge.

Today, many oil and gas companies continue to use advanced collaborative environments (CEs) of varying types to support multidisciplinary work sessions, make decisions in real time and gain access to external expertise.

A recent industry survey on the future of collaboration in the oil and gas industry documented that people not only want to collaborate, many companies want to know how to make it happen, according to Darrel Fanguy, Houston CTC manager and global practice manager of oil and gas at survey-sponsor Cyviz.

Fanguy emphasized that collaboration is even more advantageous during tough times owing to increased cutbacks on travel in addition to the usual restrictions on visiting certain locales in the world.

"A collaborative environment allows you to conduct meetings at a desk or sitting in a conference room in Houston talking to one of the collaboration rooms wherever they are," Fanguy said. "The CE kind of addresses some of those issues that popped up with the way the economy is.

"Collaboration is a tool that's always been there," he said, "and the collaborative environment could be a definition of what you want to make it do.

"It could be a conference room with video cameras, one of the big visualization environments and everything in between," Fanguy noted. "So when I talk about collaboration, I talk about getting people connected using technology and technical tools available today that are easy to use – even for those who have to learn it on their own."

The Price Is Right

In contrast to the early days of CEs, advances in technology are enabling folks to indulge in this activity on the cheap – relatively speaking – without the need for oversized upscale real estate with a hefty price tag.

In fact, technology has improved to the point that a collaborative environment with furniture, servers, clusters and more can be put together for as little as $80,000, according to Fanguy. This differs markedly from the few million bucks often shelled out for the somewhat grandiose facilities that kicked off this trend.

Today, the CE offers an added benefit for the oil industry that is losing vast amounts of knowledge when its experienced professionals opt to retire.

New recruits are coming in with

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'Discovery' Forum Set for Denver

This year's Discovery Thinking Forum – not to be confused with the "Discovery Thinking" technical session – will once again feature seven speakers who have been recognized as giants of the profession.

The forum, chaired by Charles Sternbach and Ed Dolly, will be held at the AAPG Annual Convention and Exhibition from 1:15-5 p.m. on Monday, June 8.

This will be the second presentation of the AAPG 100th Anniversary Committee's program recognizing "100 Who Made a Difference."

This year's speakers – all renowned for their success in exploring and finding hydrocarbon reserves – are:

- ✓ Bill Barrett.
- ✓ Richard Findley.
- ✓ Steve Kneller.
- ✓ Doug Strickland.
- ✓ M. Ray Thomasson.
- ✓ Bob Weimer.
- ✓ Marv Brittenham.

Each speaker will discuss how they overcame huge challenges to succeed in both business and geological aspects of the profession.

Topics to be discussed include philosophies of exploration; lessons learned; professional insights; and personal stories and anecdotes.

The Discovery Thinking technical session, also chaired by Sternbach and Dolly and featuring nine oral presentations, will be held from 8-11:40 a.m. on Monday, June 8. ❑

Networking Spurs Student Expo Success

By MIKE MLYNEK
AAPG Asst. Manager – Student Focus

Representatives from 22 companies plus 205 students – including some from non-U.S. locales – attended the recent AAPG-SEG Spring Break Student Expo in Norman, Okla.

Students from as far away as Mexico and Minnesota made the trip to the University of Oklahoma campus, where they experienced networking, company interviews, poster sessions, short courses and various entertainment activities.

Making contacts was an especially high priority at the Expo, and students were kept busy just by getting to know as many people – company and otherwise – as possible.

"I think the student Expo is a great opportunity and a good learning experience for any graduate student," said Shannon LeBlanc, a senior at the University of Louisiana, Lafayette, who will do graduate work at the University of Houston.

"Most students, including myself, noticed things were pretty fierce this year, but I think we can take that as some of the best experience," she said. "We all have to learn how to be competitive and how to market ourselves (especially right now) and the student Expo definitely gives us the opportunity to do so."

The Expo ended with an awards ceremony to honor the winners of the best poster contest. They were:

Geology

❒ **Christopher D. Althoff**, University of Oklahoma (first place, $500).

❒ **Lois E. Yoksoulian**, University of Kentucky (second place, $250).

❒ **Ryan D. Lindsay**, Baylor University (third place, $100).

Geophysics

❒ **Victor Pena**, University of Oklahoma (first place, $500).

❒ **Jesus Eduardo Mar Hernandez**, CICESE (Mexico) (second place, $250).

❒ **Charles B. Inyang**, University of Houston (third place, $100).

The Spring Break Student Expo was the first of several similar AAPG Student events planned for the coming year. For information on the program and events go to students.aapg.org.

Upcoming events include:

✓ Student Job Quest, Sept. 20-21 (with Eastern Section meeting), Evansville, Ind. (www.esaapg2009.org/).

✓ Fall Student Expo, Sept. 21-22, Houston (www.studentexpo.info).

✓ Rocky Mountain Rendezvous, Sept. 25-28 (tentative), Laramie, Wyo. (aapg.gg.uwyo.edu/RockyMtnRendezvous/home.html).

✓ West Coast Student Expo, Oct. 1-3, California State University, Northridge, Calif. ❑

Collaboration

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exceptional technical expertise but little knowledge of the industry overall, not to mention where the reserves are, what the Gulf of Mexico is all about, etc.

There's a need to transfer knowledge quickly, and a CE can serve as the ideal vehicle. After all, if people are going to retire, they're not going to want to go to Angola or offshore or wherever.

"The student can sit in the collaborative environment, and the experts can be at home and Skype their way into a room," Fanguy said. "A lot of tools can be downloaded from the Web, and you can buy one of those little $39.95 cameras and the experts can talk to the students in the CE.

"You can connect both the students and the experts to the rig," he said. "You have cameras on the rig, sensors coming from the rig – you've got real time drilling going on, real time monitoring, and now you have all three locations connected."

Seeing Is Believing?

Today's young people don't have the practical knowledge on the oil and gas side, Fanguy said, "but they expect the technology because they *get* it. They think something like video-conferencing is the norm.

"If you bring them into a big company and put them in an open cubicle environment they'll freak out," Fanguy asserted. "They'll expect something like a collaboration room with a lot of technology."

This could go a long way to attract those potential job candidates who harbor the idea that working in the oil and gas industry means they'll spend many of their days in grimy overalls and hard hats.

"It's all so high tech today," Fanguy noted. "The drilling foreman is in the office in Houston talking to the rig every morning, and the guy doing the geosteering is in the office or on the rig but in a control room.

"How you find oil is basically to bring people into a room environment and do interpretations and all on 3-D graphics," he said. "It blows these kids' minds when they see it.

"It all comes down to collaboration and communication," Fanguy emphasized. "The only way to get them up-to-date on our technology is to get them in front of it." ❑

An idea that could spread

Colorado 'Hot Rocks' Enticing

By LOUISE S. DURHAM
EXPLORER Correspondent

There's been much ado about oil and gas drilling and production in the Rocky Mountain region.

Today, there's also another energy source in the region that's receiving some close scrutiny: geothermal energy for electricity generation.

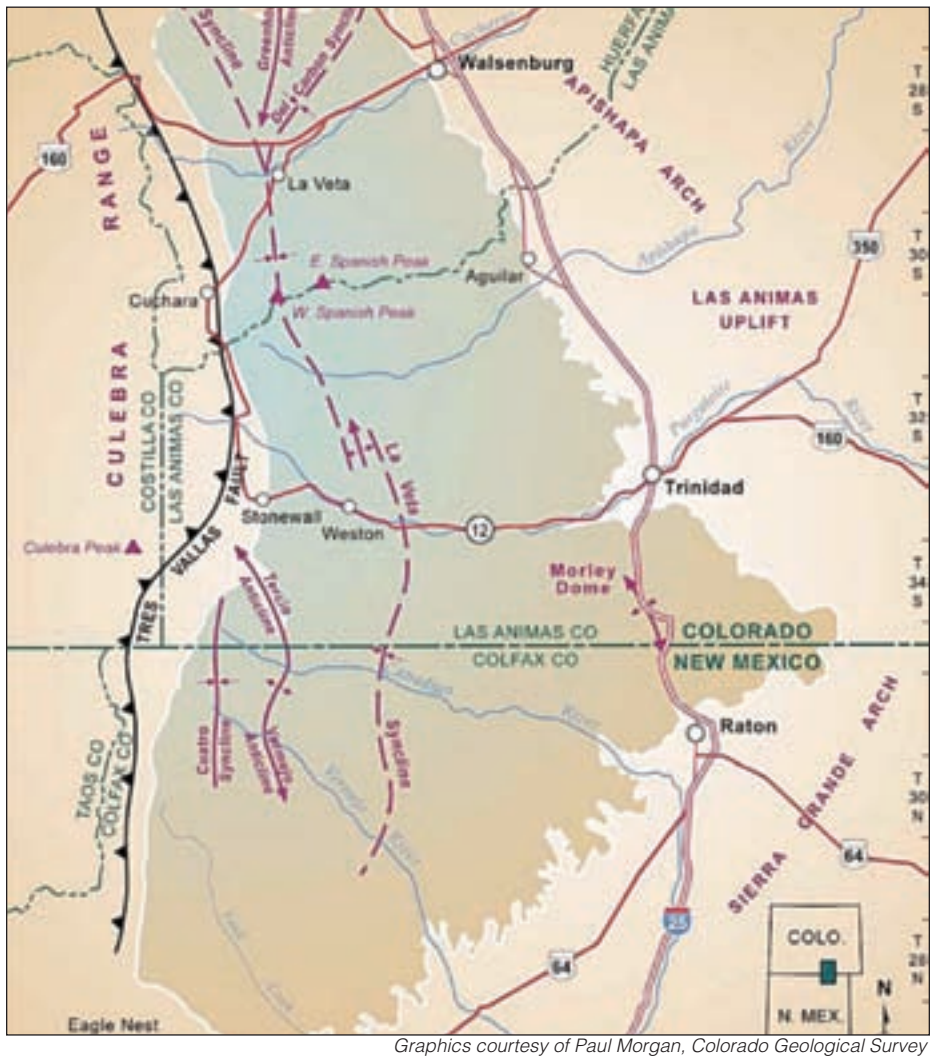
The research effort on the potential for geothermal in this area has focused on the Raton Basin, which is the southernmost classical Laramide Basin in the Rocky Mountain region and straddles the New Mexico-Colorado state line.

The central part of this sedimentary basin, just west of the town of Trinidad in southern Colorado, has been determined to be a region of high heat flow and an area of interest as a potential geothermal resource.

This discovery was made by piggybacking on existing old information without any need to acquire new data, according to AAPG member Paul Morgan, geothermal geophysicist at the Colorado Geological Survey, which sponsored the effort.

"There's been extensive drilling for coalbed methane since 1998," Morgan said, "and I went through 2,000 well logs, read the header and collected the (subsurface) temperature data.

"These data have been compiled, reduced and interpreted," Morgan said, "and the results confirm there is a significant potential geothermal resource in the basin, concentrated on the eastern side of the basin."



Graphics courtesy of Paul Morgan, Colorado Geological Survey

Hot Stuff

He noted that temperatures exceeding 150 degrees C, or 300 degrees F, are conservatively estimated at depths less than 8,200 feet, and they are sufficient to generate electricity using binary power plant technology. Temperatures close to these predicted temperatures have actually been measured at depths as shallow as 500 feet.

"No one has developed anything like that in the United States yet," Morgan said, "mainly because they've been looking in crystalline rocks versus sedimentary rocks, so far."

The sedimentary rock units at the depths where the temperatures are hot enough to generate electricity likely are not permeable enough to allow geothermal fluids to circulate at a rate necessary to generate electricity economically, according to Morgan.

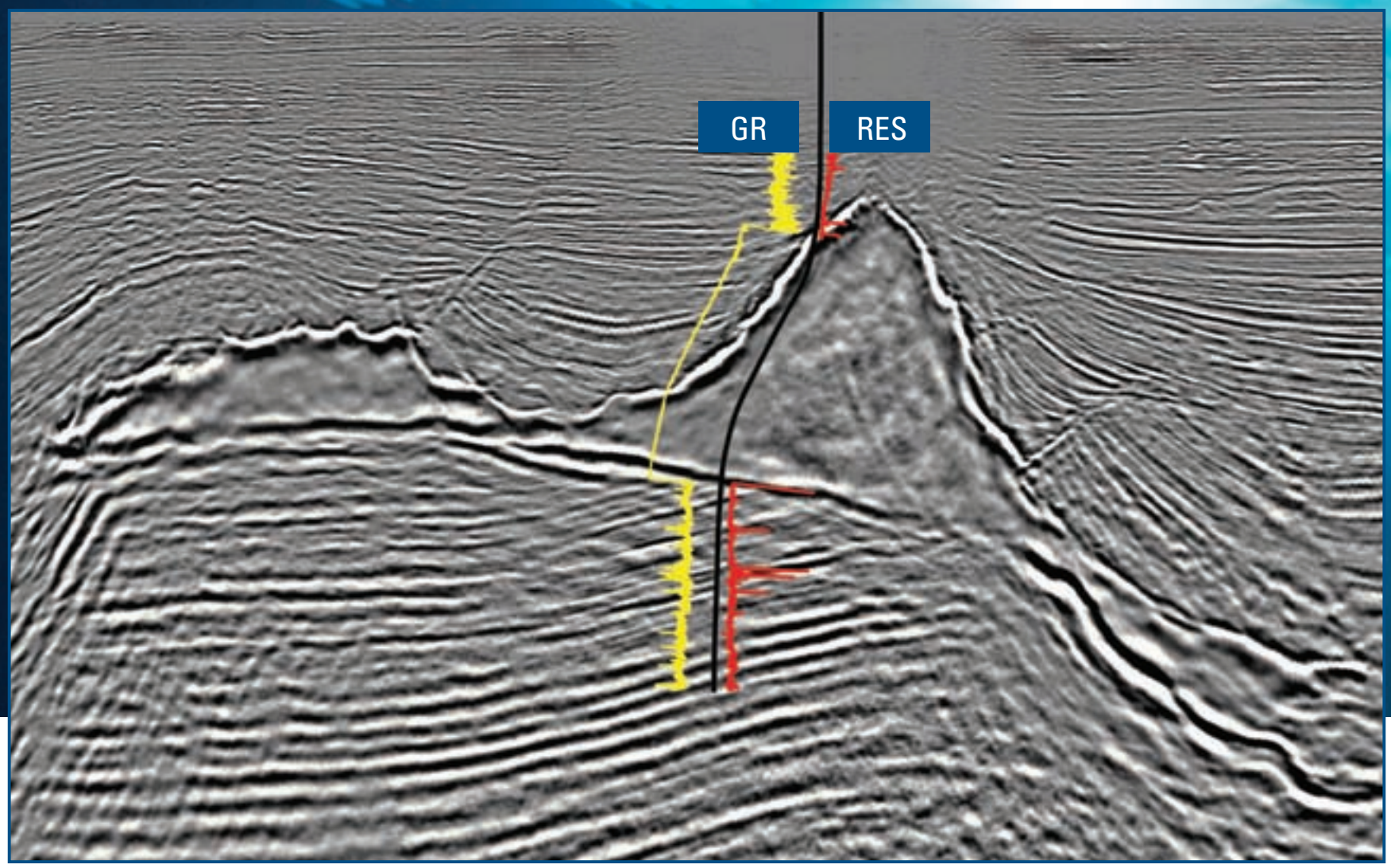
However, the permeability in the rocks can be increased via hydrofracing to create artificial fractures. This would result in an enhanced geothermal system that would be new in practice, even though the technology to produce this kind of system in sedimentary rocks is mature.

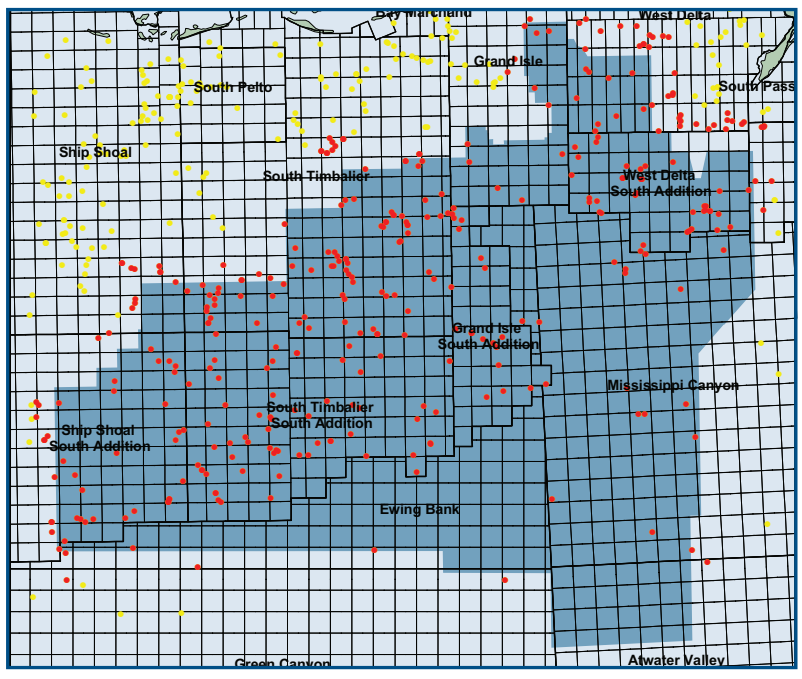
Dependability?

Morgan said the Survey intends to seek project funding from the U.S.

See **Geothermal**, page 18

Clarity at Depth





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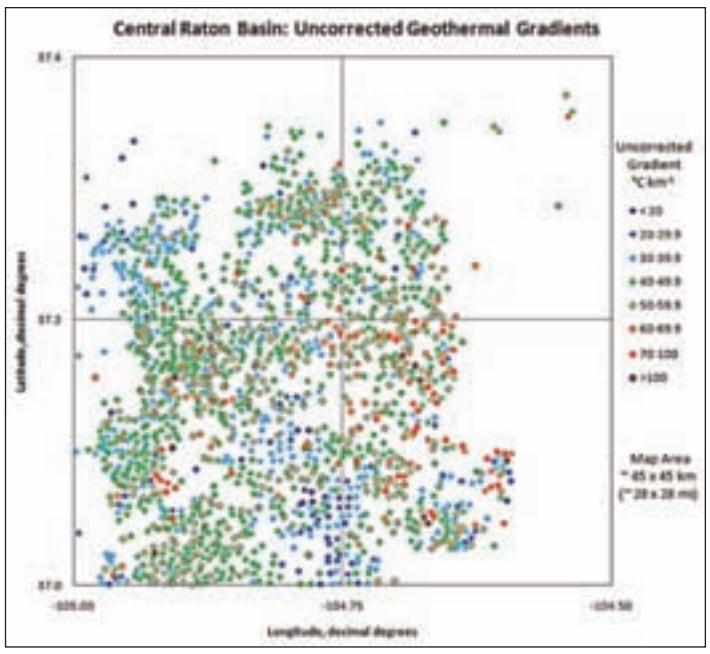
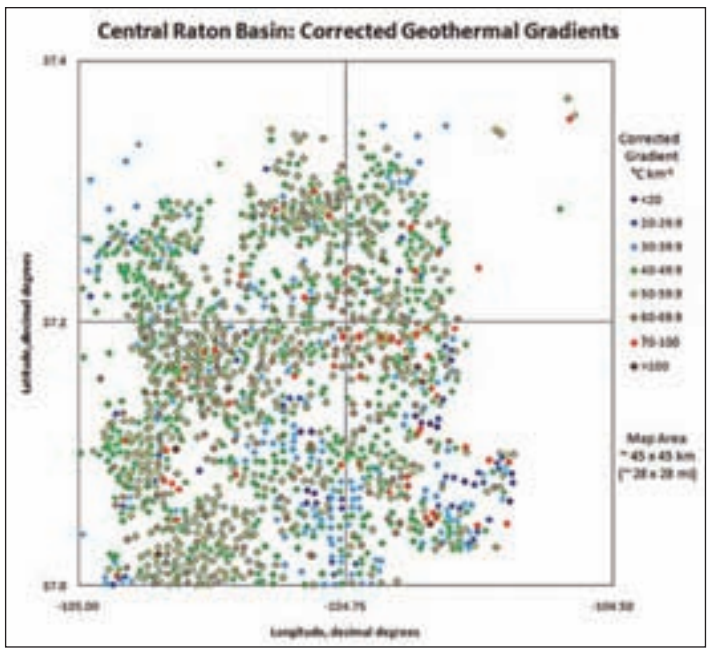




Geothermal

from page 16

Department of Energy, probably in collaboration with Colorado School of Mines and Pioneer Natural Resources. Pioneer holds all the coalbed methane resource in the Basin where it has drilled extensively, generating the information about subsurface temperatures used in the research.

"If we can get the funding to go ahead, we would try to drill a deep hole to confirm the temperatures and test the fracturing and could be on line with a test facility in as little as three years," Morgan said. "That will be just a couple of megawatts."

Ultimately, the plant could top out at 10-20 megawatts. This would be adequate to power Trinidad, which is within 10 miles of the resource.

Morgan emphasized there's no intention to solve the nation's energy crisis with such a system, but to make a contribution.

He noted also that it's a shallow resource, so if it can be proved this would provide incentive to go down to the 10,000 to 12,000-foot range. This means there would be many more basins throughout the Midwest that will be open to geothermal expectation.

The proposed binary power plant likely would be cost effective after seven to 10 years, depending on the price of oil. Once the plant is built, the fuel is cost-free – and always available.

"Geothermal is a base load system that runs 24 hours a day, seven days a week, 365 days a year," Morgan said, "so it's there when you need it, all the time.

"You don't have to wait for the wind to blow or the sun to come out," he emphasized. "Wind and solar make great contributions, but aren't necessarily there at peak demand time whereas something meeting the base load is always there when it's needed.

"Also, geothermal facilities have fewer working parts than most other plants," Morgan noted. "You have a working load up around 97 percent, so it's online longer than just about any other type of power plant – you have less downtime."

A Few Concerns

Lest it sound too good to be true, there is a downside of sorts.

One must go to the resource rather than where it's wanted. In other words, it has to be used where it's generated.

"There's no point in generating electricity and transporting it hundreds of miles, as you lose power," Morgan said. "If a town uses electricity, let them use it there – it's still a contribution and less demand on the national grid, especially if it's a very reliable source."

If you're pondering the environmental blight of the binary power plant, not to worry.

"Most of them don't use water cooling towers anymore," Morgan said. "It will use air-cooled cooling, so it's not much of a visual impact – probably no more than 40 feet high.

"It will be much smaller than a normal power plant with no effluents coming out," he said. "It will look pretty benign, and Trinidad may build a wall to cut down on noise."

Next on Morgan's agenda is a similar project for Southern Methodist University to update some AAPG studies from a couple of decades ago.

"I'm going through material from the Midwest and the eastern states to do the same kind of thing," he said, "harvesting data already there – it's kind of picking the low hanging fruit." ❑

Burgess Shale Has Stories to Tell

Formation has 'fan club,' 100 years of discoveries

By SUSAN R. EATON
EXPLORER Correspondent

In July, the Burgess Shale Geoscience Foundation (BSGF), a not-for-profit Canadian organization focused on geoscience education and public outreach, kicks off the 100th anniversary of the discovery of the Burgess Shale, a formation containing a unique fossil assemblage of diverse, soft-bodied life forms that developed during the evolutionary "big-bang" called the Cambrian Explosion.

With only one full-time staff member, this small but vital organization relies heavily upon volunteers – oil and gas geologists, structural geologists, research paleontologists and climate change scientists – who are passionate about hiking in the Canadian Rockies, and who delight in bringing the lessons of the Burgess Shale to the general public, science teachers and school children.

During the past 14 years, the BSGF has guided more than 45,000 clients from all over the world to the two protected fossil locales in British Columbia's Yoho National Park: the Walcott Quarry and the Mount Stephen Trilobite Beds.

Serendipity played a role in the exquisite preservation of these animals' soft body parts, and in their subsequent uplift and exposure during the Rocky Mountain Orogeny.

Serendipity played a further role in the discovery of the Burgess Shale: During the final days of the 1909 summer field season, Charles Doolittle Walcott, former head of the Smithsonian Institute and the U.S. Geological Survey, was navigating Burgess Pass on horseback when he discovered these 505-million-year-old fossils, famous for their amazing diversity, bizarre life forms and out-of-this-world appendages and proboscises. Walcott had come to Yoho National Park, in search of "stone bugs" excavated during the construction of the Canadian Pacific Railway.

The fossil discovery – and its significance to the understanding of the evolution of life – led to the protection of the Burgess Shale in 1981 as a UNESCO World Heritage Site. In 1984, the Burgess Shale was integrated into the Canadian Rocky Mountain Parks UNESCO World Heritage Site.

"The 2009 Centennial Program that's been laid out is simply amazing – it reaches all stakeholders," said AAPG member G. Warfield "Skip" Hobbs, a member of the BSGF's board of directors and managing partner of Connecticut-based Ammonite Resources. "The programs are spread from Alberta to British Columbia, from one side of the Canadian Rockies to the other.

Hobbs

"The Burgess Shale is an outstanding natural field laboratory," Hobbs continued. "The Burgess Shale appeals to everyone, whether you're a six-year-old child interested in trilobites, or a renowned professor of paleontology."

According to Hobbs, the BSGF's three educational themes – the origin of life on Earth, mountain building and climate change – can all be observed during a single field trip in Yoho National Park.

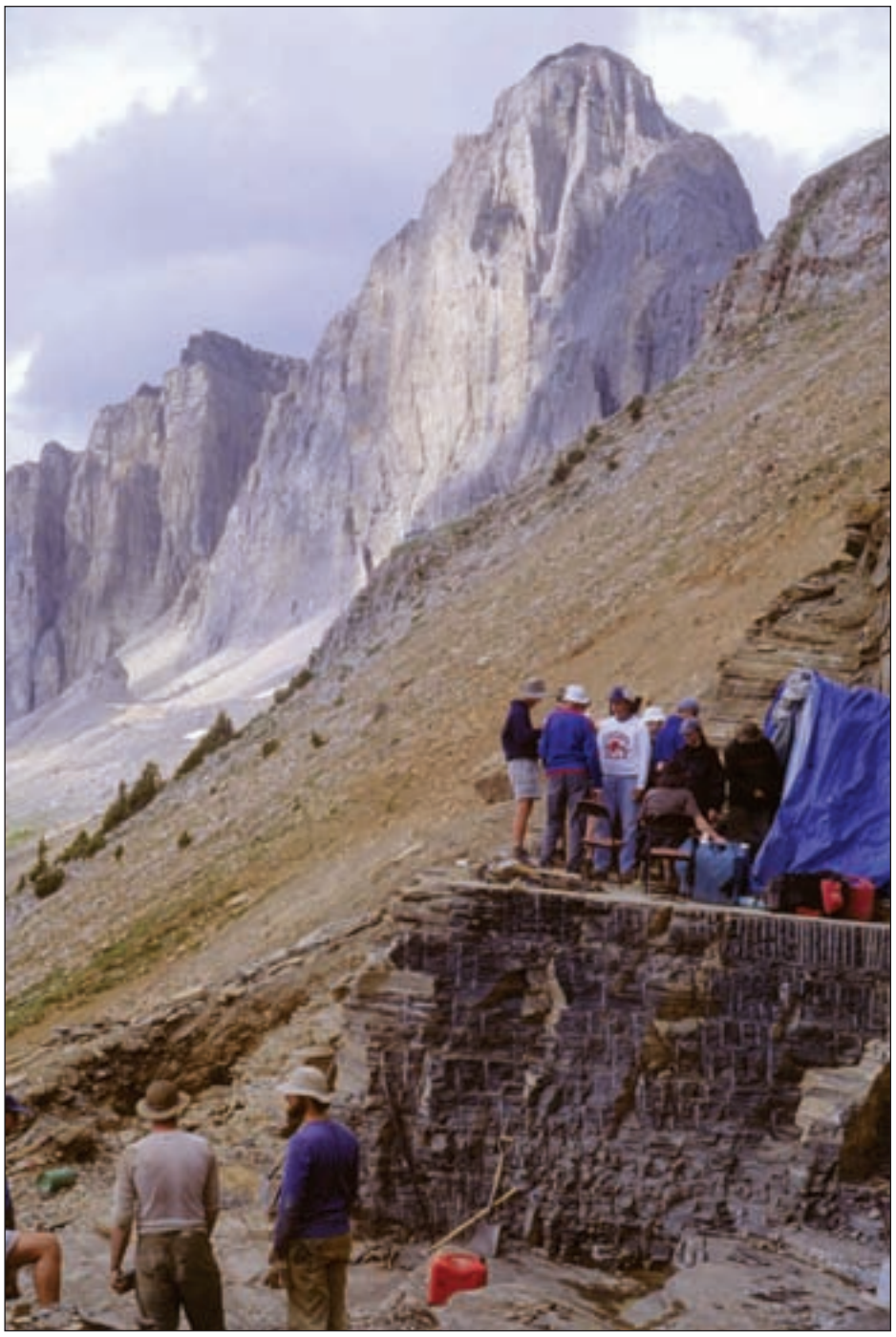


Photo courtesy of Jon Dudley

Classroom in the sky: Geologists at the Burgess Shale-Walcott Quarry, at 7,600 feet elevation, in Canada's Yoho National Park.

"This is a place where one can observe the impact of climate change, first-hand," he explained, describing hanging valleys, lateral moraines and the rapidly disappearing glaciers of the Canadian Rockies.

"The general public can see these features very easily – they're readily accessible."

The BSGF's summer-long Centennial Celebrations are extensive – for hikers and non-hikers alike – and are designed to engage stakeholders from all over the world, introducing them to the wonders of geology.

Activities will include geo/paleo art for kids, guided hikes for kids (led by kids), hikes for the general public, a series of public Chautauqua gatherings featuring international and local lecturers, presentations by Walcott's descendents and an historical re-enactment – on horseback and in period costume – of Walcott's famous discovery of the Burgess Shale.

Making It Matter

The BSGF's mandate is to increase science literacy, and its over-arching theme, "Putting Earth Back Into the Sciences," is accomplished through education and public outreach.

"We know that most students who are interested in science will not be exposed to Earth sciences in the school system," explained Jon Dudley, exploration manager of thermal oil sands for Calgary-based Canadian Natural Resources Limited. Dudley has been a BSGF volunteer for a decade, guiding to the Walcott Quarry and the Mount Stephen Trilobite Beds, and instructing the science teachers' workshop held in Yoho National Park every August.

This summer Dudley will deliver a Chautauqua lecture, "Of Mountains, Soda Pop and Carbon Dioxide." The lecture's title, he said, originated from his application of geological concepts to the high school chemistry curriculum.

"We've tried to take geological examples that kids can relate to," he said, "and apply them to the pure sciences."

"Everyone drives through the 'blue' Canadian Rockies," Dudley continued, "so let's talk about the chemical equilibrium, thermodynamics and reactions involving these mountains of rocks – let's view the rocks as composed of minerals which are chemical compounds."

During the years, Dudley has developed a tool kit of simple, geologically-based experiments and real-life exercises – focusing on carbon dioxide – for high school chemistry teachers to incorporate into their lesson plans:

✓ Understanding that soda pop is fizzy, due to carbonic acid.

✓ Dipping white paper into vinegar, to determine how much calcium carbonate is in the whitening compound in the paper.

✓ Dipping fossils containing limestone into hydrochloric acid and observing the fizz.

✓ Investigating the chemical reactions that occur at a cement plant located in the front ranges of the Rocky Mountains.

See **Burgess**, page 22

Photos courtesy of Murray Coppold, Burgess Shale Geoscience Foundation and Alex Mowat

Out of their element? Aysheaia (left) and trilobites that have gone from the sea floor to the mountain top are found at the Burgess Shale-Walcott Quarry in Yoho National Park. The Burgess has been called "Mecca for paleontologists."

Happy Birthday, Burgess Shale

Free Centennial Chautauqua lectures are scheduled from July to September, in Alberta and British Columbia. They include:

✓ 100 Years of Scientific Exploration and Discovery in Yoho National Park: The First Century.

✓ Great Canadian Fossils and the History of Life on Earth.

✓ Aliens in Rocks.

✓ A Geological Odyssey: Bicycling around Iceland.

✓ Climate and the Geological Record of Climate Change.

✓ Around the Permian World in 80 Slides.

✓ From Galapagos Finches to the Burgess Shale: How Modern Biology Resolves Darwin's Dilemma and the Evolution of Complexity.

✓ Circle of Life: The Influence of Continental Drift on Evolution.

✓ Fluid Geochemistry in the Western Canada Foreland Basin and Paleoclimate Influence.

✓ Of Mountains, Soda Pop and Carbon Dioxide.

✓ Polar Climate Crisis: Climate Change with particular focus on how the polar regions already have changed, and how they will continue to change.

Walcott

✓ From Oceans to Mountains … to Oceans.

✓ The Geological History of the Burgess Shale Area: The History of the Planet from Creation Present with an Emphasis on the Burgess Shale and Rocky Mountains.

For a complete listing of the 2009 Centennial Celebration activities, including venues, dates and times, to burgess-shale.bc.ca/.

– SUSAN R. EATON

Burgess

from page 20

✓ Calculating how many moles of carbon dioxide are stored (or sequestered) in Mount Field in Yoho National Park – and measuring the equivalent volume of greenhouse gas that could be released from the mountain.

In its tenth year of operation, the three-day science teachers' workshop attracts junior and high school teachers from Canada, the United States and globally. Classes range in size from 16 to 24 students.

AAPG member Clint Tippett, a principal regional geologist with Calgary-based Shell Canada Energy, volunteers as an instructor for the science teachers' workshop. Tippett is part of a five-person team of professional geologists who spend their summer vacations running teachers through a crash course on geology 101 – lectures include mineral and rock identification, paleontology, glaciology, climate change, the use of topographic maps and the principles of coal, oil and gas extraction.

All of these lessons are reinforced during geological field trips that begin in the front ranges of the Rocky Mountains and end west of the Continental Divide in Yoho National Park.

Philip Benham, a staff geologist at Shell Canada Energy, also assists in the science teachers' workshop. "I enjoy the field trips the most, because the teachers ask some basic questions which really force me to think," he said, "because geology is full of technical jargon."

As part of the centennial celebrations, Benham will deliver a Chautauqua lecture titled "Circle of Life: The Influence of Continental Drift on Evolution." The following day he'll guide participants to the Walcott Quarry.

Benham gets excited when he can demonstrate oil and gas principles in the field. At Grassy Lakes, Alberta, he said, "the teachers can actually climb inside a pore in outcropping Devonian carbonates." And at Mount Yamnuska, in the front ranges of the Canadian Rockies, teachers can observe blue Cambrian carbonates thrusted over red Cretaceous shales.

"The teachers start looking at the mountains in a different way," Tippett said. "They learn the concept of geological time – how long it takes to deposit rocks, and how long it actually took for the mountains to form."

Tippett uses a time analogy for mountain building – which blows the teachers away – suggesting that the orogeny occurred at the same speed as human fingernails grow.

"It's good to see the teachers' enthusiasm, and to know that it's going to be passed along to the students," he said.

Convinced more than ever that the BSGF's geoscience education program is addressing a need in today's society, Tippett asks, rhetorically: "How knowledgeable are legislators and the general public about issues that are impacted by Earth sciences?"

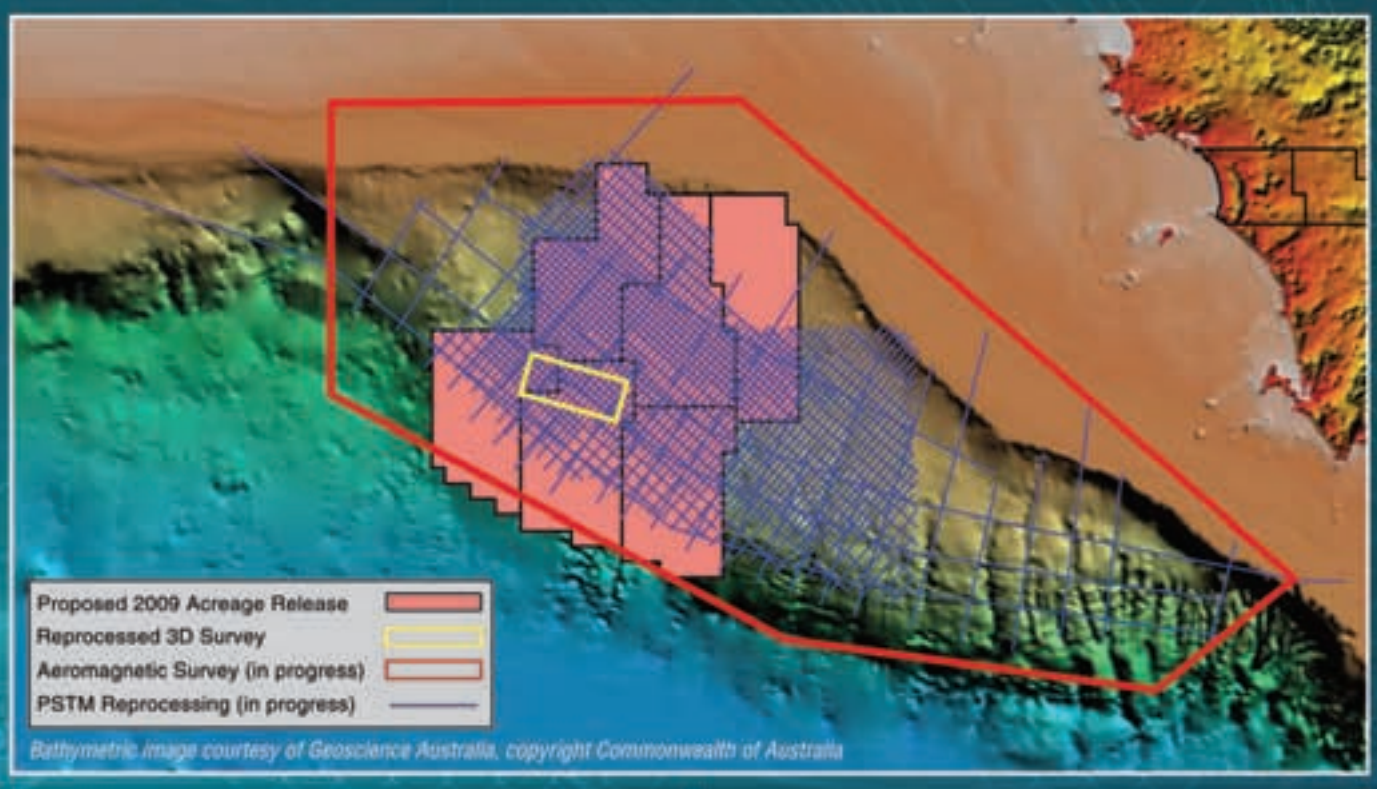
Hobbs echoes Tippett's comments: "If we hope to influence the political debate, we have to educate the general public. By promoting the BSGF, the resource sector (oil and gas, and mining) sees the returns come back, in spades."

See **100 Years**, page 24

Great Australian Bight Project

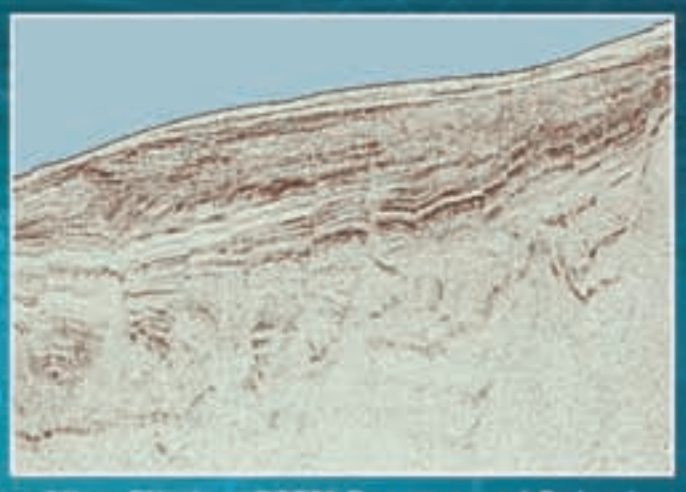
Ceduna Sub-Basin

- Joint project between Fugro Multi Client Services and MultiClient Geophysical
- PSTM reprocessing 21,290 km of 2D seismic data with gathers, angle stacks and AVO
- 1,250 km^2 of reprocessed 3D seismic
- Approximately 60,000 line km of new aeromagnetic data in progress
- Existing satellite and marine gravity data
- Satellite seep data
- Integrated interpretation report



Bathymetric image courtesy of Geoscience Australia, copyright Commonwealth of Australia

Before: Flinders Open File Seismic



After: Flinders PSTM Reprocessed Seismic

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

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FUGRO

100 Years

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Benham helped develop one of the BSGF's innovative teaching tools, "Geopardy," a board game fashioned after the TV-game-show "Jeopardy," which features questions about basic science, geology and the oil and gas industry.

"The teachers get extremely competitive," he said. "It's a lot of fun."

But science teachers aren't the only ones playing "Geopardy" – 2009 marks the second anniversary of the BSGF's Kids in Science Program (KISP), this year funded by Imperial Oil, the Canadian Society of Exploration Geophysicists and the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

In May, 35 KISP volunteer mentors will run 160 school children (grades 7-9) through a spirited game of "Geopardy," and will squire them around the exhibit floor at the Canadian Society of Petroleum Geologists' annual convention, held jointly with other geoscience groups.

Fifteen years ago, David Moore, an aspiring young geologist at the University of Calgary, landed his dream summer job – he couldn't believe that someone would actually pay him to guide groups to the Burgess Shale.

"I got into geology because I liked paleontology," he recalled. "The Burgess Shale is 'Mecca' for paleontologists – it was like being asked to work on King Tut's tomb, for an Egyptologist."

Today Moore is team lead for Calgary-based Enerplus Resources Fund's unconventional gas team and business development. As a BSGF volunteer for the centennial celebrations, Moore will give two Chautauqua lectures, guide two hikes to the Walcott Quarry and conduct several "Lunch & Learns" in Calgary.

"It's a tremendous opportunity to reach out, to get people interested in the Burgess Shale and science in general," Moore said, adding that, for geologists, "hiking in the Rockies and connecting with the fossils reminds people about why they were interested in geology and science in the first place."

Moore described the marathon, round-trip hike to the Walcott Quarry – it's 14 miles long and includes a 2,500-foot vertical elevation gain – as "a team-building exercise."

"People are excited; there's a sense of discovery, awe and wonder," he said. "They see gill branches on the undersides of arthropods that don't survive 15 minutes, post-mortem, yet are preserved in the Burgess Shale – it's like you're touching part of the past." ❑

She Wears Two Hats for Burgess Shale

For the past year AAPG member and Explorer correspondent Susan R. Eaton has volunteered for the Burgess Shale Geoscience Foundation – specifically, Eaton has assisted with fundraising and media activities for the BSGF's 2009 Centennial Program.

"Yoho National Park is one of the crown jewels of the Canadian Rockies," Eaton said, "and it contains the most significant fossil find of the century."

Since first encountering the Burgess Shale some 15 years ago, Eaton has made the arduous trek to the Walcott Quarry on four occasions.

She also has hiked, twice, to the Mount Stephen Trilobite Beds, where she introduced renowned geologist and best-selling author Simon Winchester to the natural wonders of the Burgess Shale.

"Imagine, traversing a mountain, chock-a-block full of trilobites of all shapes and sizes," Eaton said. "Geologists and non-geologists alike must experience, first-hand, the excitement and wonder of the Burgess Shale."

Oil and gas corporations and individuals alike can visit the BSGF's Web site (burgess-shale.bc.ca) for information or to make a donation in support of the activities. ❑

Photo courtesy of Alex Mowat

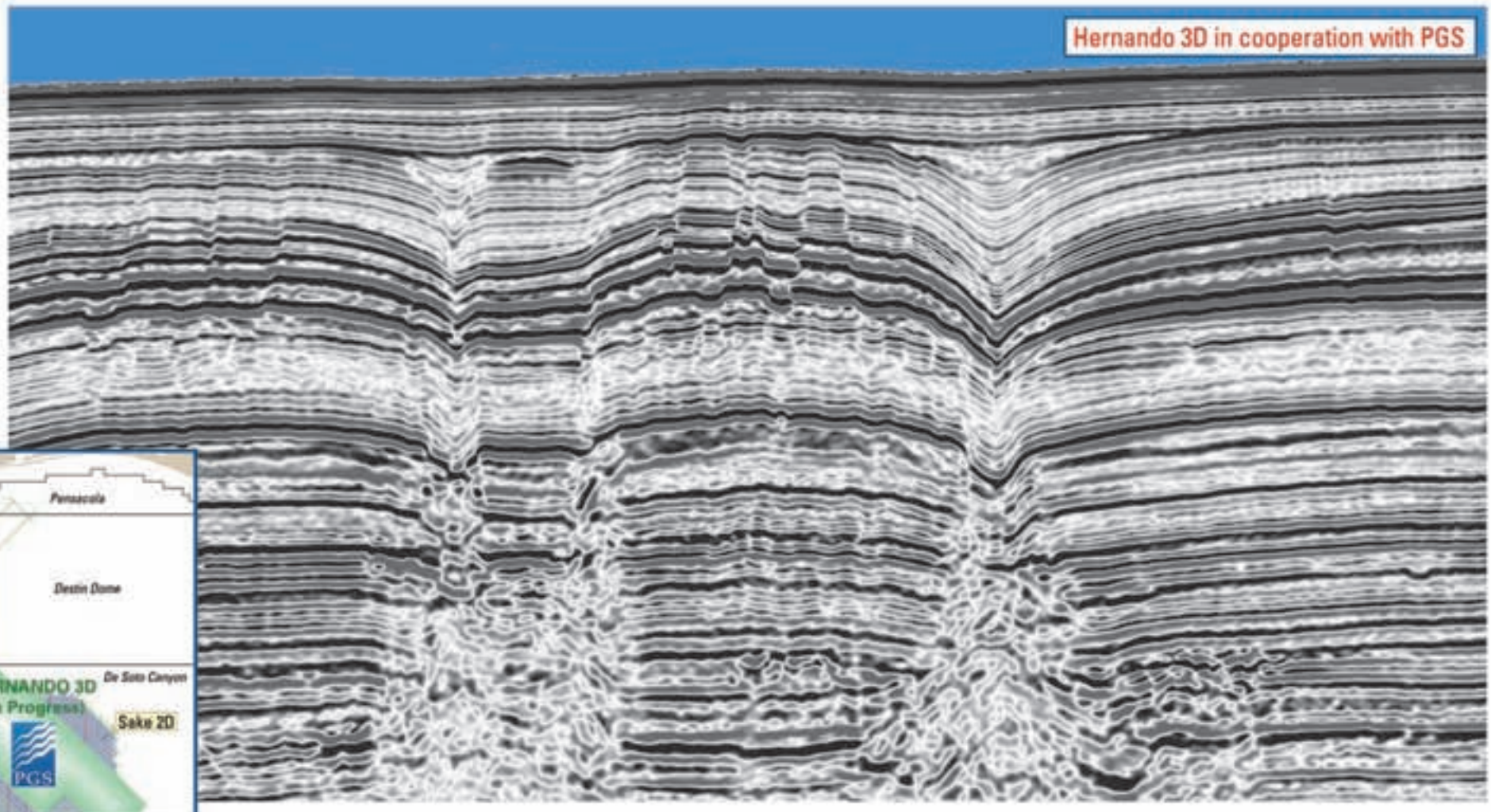
Rocky Mountain naturalist Alex Mowat with EXPLORER correspondent and BSGF volunteer Susan Eaton, at the Burgess Shale's Walcott Quarry.

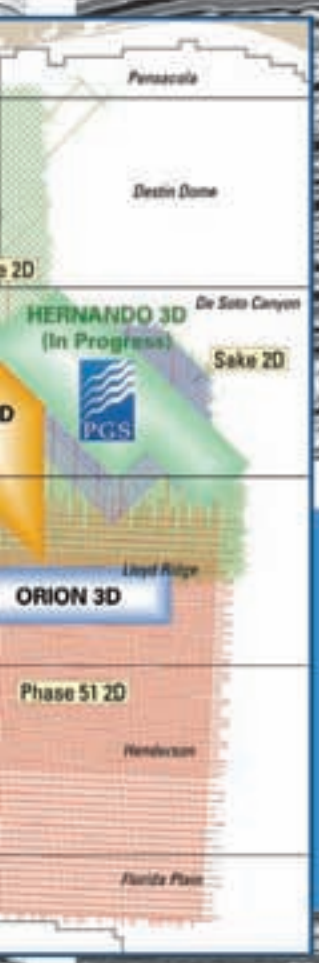
Photo courtesy of Burgess Shale Geoscience Foundation

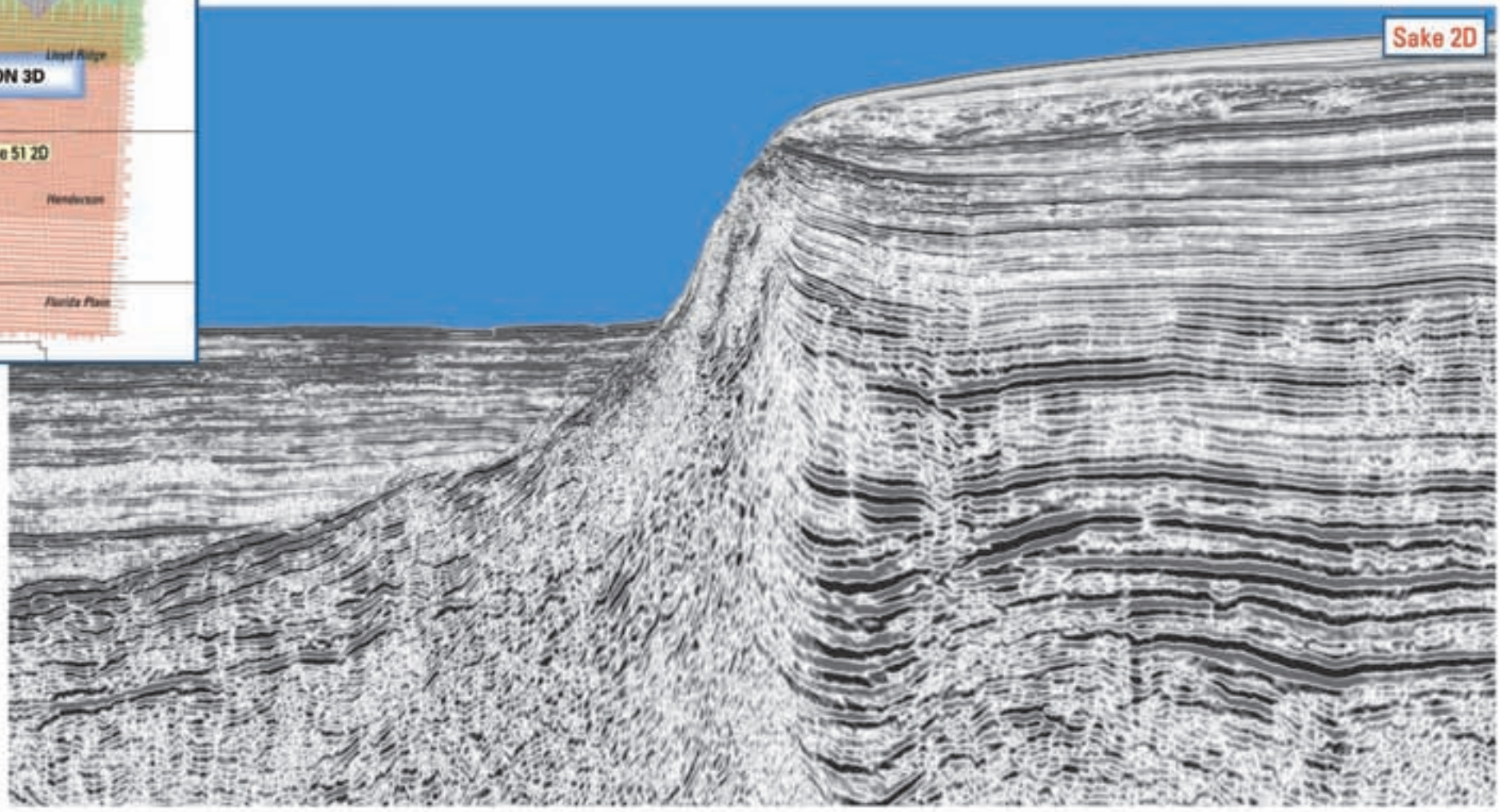
A Burgess Shale guide and his pupils, with Emerald Lake in the background: "People are excited; there's a sense of discovery, awe and wonder."

D

TGS







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An uplifting story

Rocky Mountains Get Deep Study

By BARRY FRIEDMAN
EXPLORER Correspondent

Everyone knows that Colorado is a scenic, beautiful locale.

Scientists using state-of-the-art 3-D seismic technology are trying to explain in detail how it got to be that way.

The Colorado Rockies Experiment and Seismic Transects – perhaps better recalled by its acronym, CREST – is a project that will provide near 3-D teleseismic images of the geometry of the mantle anomaly in the central part of the state.

More specifically, CREST will investigate time-space correlation between Cenozoic rock uplift and denudation patterns, magmatism and the modern day mantle anomaly using a host of integrated geological and geophysical techniques.

The purpose is to understand when and why changes in lithospheric buoyancy occurred in the Rockies, how these changes have been expressed in terms of Cenozoic magmatism and the topographic evolution of the highest elevation region of the Rocky Mountains.

In other words, why those beautiful mountains are so beautiful.

"We hope to gain increased understanding on how intra-plate mountain building and continental lithosphere evolve under a wide variety of tectonic influences relevant to western North America, and generally on Earth, including compression, extension, magmatism and small-scale mantle convection," said CREST principal investigator Rick Aster.

Looking for Answers

CREST's focus on deep Earth imaging is intended to augment pre-existing data already gained in imaging projects, specifically since 2008, which included recorded earthquakes from around the world.

Aster, a professor of geophysics who is a department chair at the Geophysical Research Center and Department of Earth and Environmental Science, New Mexico Institute of Mining and Technology, said the CREST recorders started earlier this year and will remain in place for approximately another year, collecting seismic data to help explain how mantle processes beneath the Colorado Rocky Mountains have influenced their tectonic history.

Dating, geomorphology and other efforts, Aster said, will continue for several years after that.

"We also are surveying the gravity, geochemistry, pluton ages, geodynamics, exposure dates, stream incision and other geomorphic data, and other data from the region to assess the tectonic evolution of the region in consort with what we learn from the deep seismic imaging," he said.

Photo courtesy of Jack Olson

The Colorado Rockies Experiment and Seismic Transects project – CREST, for short – is trying to find data on the state's geologic foundations. Above, the dramatic Black Canyon of the Gunnison River.

So what is it about Colorado that made researchers deduce the Rockies were at the climax of an enigma?

"The lithosphere in the Rocky Mountain region occupies an important transition between ancient lithosphere to the east and recently altered lithosphere to the west," Aster said.

"The Rocky Mountains occupy one of the broadest plate boundary regions on Earth," he added, "where we can see lots of mantle/lithosphere dynamic processes being played out that fundamentally help us learn how continents grow, evolve and erode, both from the top and bottom, throughout Earth history."

Curtain Going Up

In theatrical terms, researchers view the history of Colorado's Rockies as something of a three-act play: The initial uplift that began as a low-angle subduction of the Farrallon plate during the Laramide Orogeny; when the strike-slip San Andreas Fault did a version of the geologic merengue and started to form; finally, the post-Laramide "ignimbrite flare-up" in the San Juan Mountains.

The hope is that CREST will now be able to review the entire show. Aster hopes the project will be at the vanguard of a new set of multidisciplinary earth investigations in the region where geologists, geophysicists, geomorphologists and geochronologists can work in larger teams to more fully characterize and understand the history of this often baffling region.

Specifically, the imaging methods employed by CREST will be:

✓ Seismic layering that shows up as velocity discontinuities (for example, Moho, at the base of the continental crust, a zone of complexity in the Rockies).

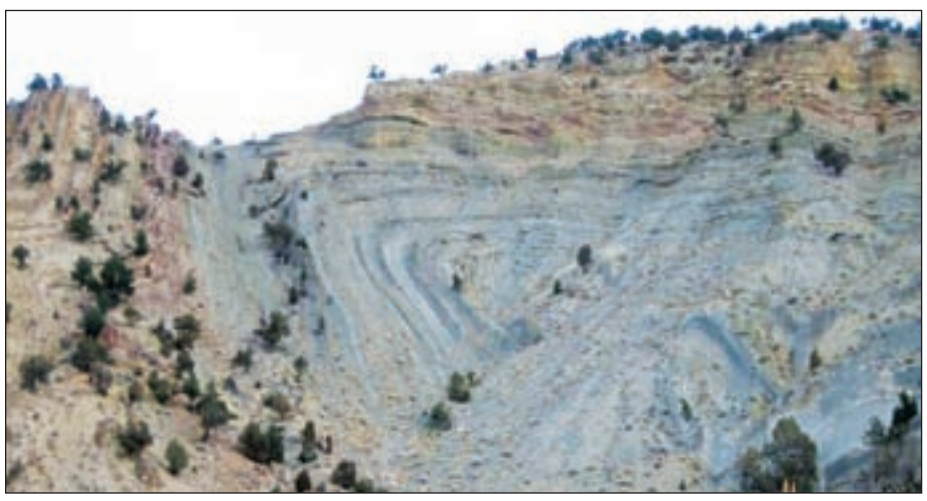
✓ Tomograms that can reveal bulk mantle seismic velocity structure (for example, in the region of Aspen).

Work like CREST has been going on elsewhere internationally for years; North America is now a player of such investigations because of EarthScope, a National Science Foundation mega-project in which CREST is imbedded, and the IRIS PASSCAL instrument pool (managed at the Instrument Center on the NMT campus).

EarthScope will probe the deep structure of the entire conterminous United States with a 2,000-station moving network of seismographic stations called USArray. CREST will add an additional 59 stations, specifically in and around the Aspen anomaly.

In a sense, they're both part of the same enigma – both hoping to unlock the same climax.

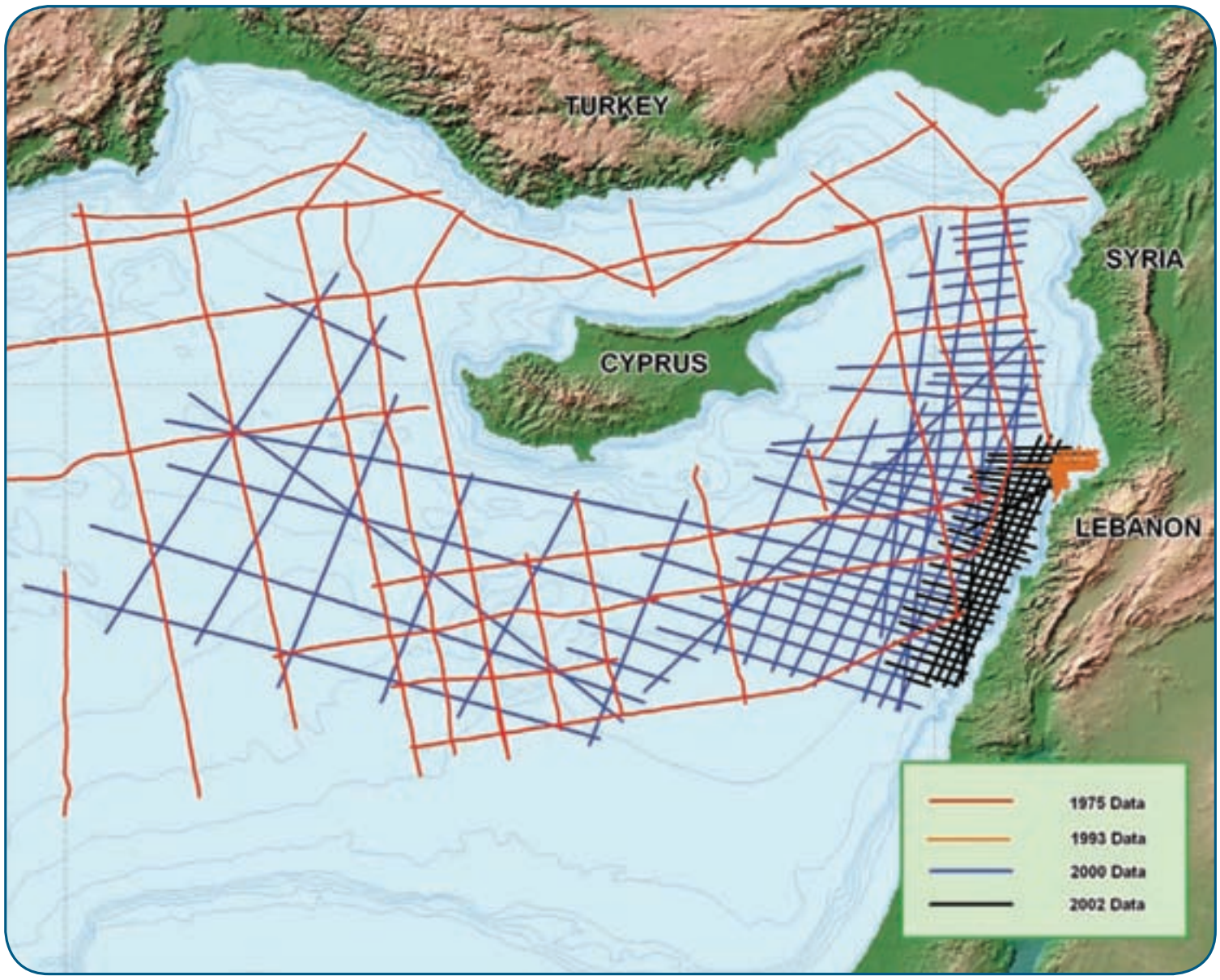
The partnership between CREST and USArray, however, constitutes one of the largest and densest seismic arrays currently deployed on earth – and represents an unprecedented scientific search for the meaning of one's state's beauty. ❑



Photos courtesy of Ken Dueker

Members of the CREST team usually work alone in the field – unless the locals show some interest, of course, as one did near Carbondale, Colo., when a CRESTer was checking the seismic data logger. The team is trying to unlock data that could help explain the state's complex geology, like this folded rock site near Glenwood Springs (right).

East Mediterranean...



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AAPG author pulls data together

Cuba Needs Big Scale Exploration

By LARRY NATION
AAPG Communications Director

Caribbean geology has always held a charm for Georges Pardo.

For the past 60 or so years, the area has been his professional focus, or at least in the periphery of his attentions.

His interest has resulted in the publication of AAPG Studies 58 *Geology of Cuba*, due to be hot off the press in time for the AAPG Annual Convention and Exhibition in Denver.

"The Caribbean always has been of great interest to me," Pardo said. "Throughout my career I have been personally involved with the geology of Barbados, Venezuela, Northwestern Colombia, the Gulf of Mexico and several geophysical transects across the Caribbean."

Born in Paris to a Venezuela father and a French mother, Pardo's family moved to Caracas when he was a teenager. Studying toward a geology degree at the Venezuelan Instituto de Geologia, he was encouraged by professor E. Mencher (later of Massachusetts Institure of Technology) to join AAPG as a student member.

"I became an (Active) member in 1945, after joining Mene Grande (the Venezuelan subsidiary of Gulf Oil Corp)," Pardo said. "I had graduated in 1943, and worked in the San Tome stratigraphic laboratory."

The highly influencial Hollis Hedberg (in whose honor AAPG Hedberg Conferences are named) was the chief geologist there – and was one of Pardo's sponsors for Active membership and later a close friend and mentor.

Photo courtesy of Georges Pardo

Georges Pardo, left, with Harry Wassall in Nuevitas in Cuba's Camaguey Province, in 1952.

Hedberg was responsible for Pardo going to Cuba.

"While Hedburg was Gulf's chief geologist for foreign exploration in New York he came to my office with a stack of reports," Pardo said, "and said "'Georges, try to make sense of this. It's a mess.'

"A few days later I went to his office and suggested to forget about everything and start studying the island all over again," he continued. "He said 'Good idea!' and a week later I was on my way to Cuba."

Pardo

The Lost Years

Pardo was in Cuba a couple of times prior to 1952, and then resided and worked there as chief geologist of Cuban Gulf Oil from 1952 to 1955.

"I never returned to the island after that," he said. "I also kept contacts with Harry Wassall (founder and CEO of Petroconsultants) and established a good friendship with Manuel Iturralde-Vinent, from the Museum of Natural History in Havana.

"The work we did in Cuba (with P. Bronnimann, Wassall and Truitt) in the 1950s was truly pioneering, but for one reason or another was never published in its entirety," he said. "Then Castro came, and communications were lost for many years."

With his interest kindled, Pardo gave several oral presentations on Cuba at AAPG and Geological Society of America meetings in New York, New Orleans, Caracas and other venues. He also wrote the paper "Geology of Cuba" for the series "The Ocean Basins and Margins" (Vol. 3, 1975), edited by Nairn and Stehli.

Pardo also contributed to "The Geology and Tectonic Evolution of the

See **Cuba**, page 32

SPOTLIGHTon...

Zagorski = Marcellus

AAPG member William A. Zagorski, Range Resources vice president of geology, has been given the title "Father of the Marcellus" by the Pittsburgh Association of Petroleum Geologists.

The award is in recognition of Zagorski's "outstanding accomplishments in the initiation and early development of the modern era of natural gas production from the Marcellus Shale in the Appalachian Basin," according to PAPG.

"This is a humbling honor, but I truly share this recognition with so many others at Range Resources," Zagorski said. "So much of the credit goes to the others at Range who believed and supported our work in the Marcellus."

Zagorski

The honor was presented at a recent ceremony by PAPG president Jim Pancake and Ray Walke with Range Resources.

"A discovery such as the Marcellus is a once-in-a-lifetime achievement," Pancake said. "This represents a tremendous opportunity to significantly boost our local economy and transform our nation's energy future."

Cuba

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Northern Caribbean Margin," by Lewis and Draper, 1990 GSA, and DNAG "The Geology of North America, The Caribbean Region," edited by Dengo and Case. He also wrote a report on Cuba for Wassall's Petroconsultants.

"Having been involved in the geology of Cuba for quite a few years, I decided that it would be a shame not to try to put all this information – much of it never published – in one volume, and also incorporate the older information into new, very good data coming out of new generations of students of Cuban geology," he said.

Big Potential – Or Big Talk?

Pardo explained that Cuba is part of an orogenic belt that forms the southern boundary of the North American continent, and though it is the southern boundary of the Gulf of Mexico it has never been much written about in the U.S. literature.

There has been a lot of buzz lately about Cuba's petroleum potential. Brazil signed an exploration agreement in November 2008, and in March Russia expressed interest in Cuban blocks and formed an exploration unit with Venezuela's PDVSA for possible exploration there.

What does Pardo think of the huge estimates of potential being tossed about?

"I do not believe any of the published estimates," Pardo said.

"On land, although source rocks and potential reservoirs are common (Cuba produced 52,000 Bod in 2007), the structural picture is incredibly complicated.

"There are very few 'conventional structures,'" he continued, "and those are faulted, fractured, thrusted to an unbelievable intensity. In most cases, the thrust plane is the only seal.

"Most of the zone where oil has been found consists of relatively thin-bedded carbonates crushed between a slab of oceanic crust overriding the Bahamas carbonates and the southern Gulf of Mexico," he said.

"To make matters worse," he continued, "the seismic response of Cretaceous and older rocks is very poor – including high velocity, poor reflection coefficients and high dips. Nearly nothing has been published about the deep offshore except articles of a promotional nature.

"The few seismic profiles I have seen do not show anything coherent below the Tertiary cover."

Already a number of fairly deep wells have been drilled along the north and northwest coast, and some of the wells bottom in sediments younger than at the surface.

"There is no indication that the extent of thrusting is known," Pardo said. "To the south of the island there is no reason to believe that anything but volcanics, metamorphics and igneous rocks are present under a thin Tertiary cover."

Wanted: A Complete Picture

If big success is to be had in Cuba, Pardo advises a comprehensive exploration program – including the Bahamas.

"Deep transects to clarify once and for all the deep structure under the island, and how it fits with North America will be needed," he said. "I am afraid that the "lease-by-lease" approach will not do it."

With Gulf, Pardo also worked at the Gulf Research Laboratory, was regional geologist in the Latin American operations-domestic exploration and served as exploration vice president for Gulf Global Exploration. When Gulf and Chevron merged in 1984, Pardo retired as general manager of Gulf's Central Exploration Group and Houston Technical Service Center.

But the geology of Cuba was still on his mind.

Studies 58 includes 88 printed pages and 360 total pages on CD-ROM (the 360 pages include the 88 printed pages plus additional data). ❑

PROFESSIONALnewsbriefs

Howard Barousse, to senior geologist, Texas Petroleum Investment Co., Houston. Previously vice president-geosciences, Centurion Exploration, Houston.

Alan P. Byrnes, to senior petrophysicist, Chesapeake Energy, Oklahoma City. Previously research geologist, Kansas Geological Survey, Lawrence, Kan.

Jhonny E. Casas, to senior geologist/sedimentologist, Gazprom Latin America, Caracas, Venezuela. Previously senior geologist/sedimentologist, SINCOR, Venezuela.

Reino F. Clark, to senior geologist, Chesapeake Energy, Oklahoma City. Previously geologist, Minerals Management Service, New Orleans, La.

Eric Cummins, to district exploration manager-Permian Basin, Kirkpatrick Oil, Midland, Texas. Previously senior exploration geologist, David H. Arrington Oil & Gas, Midland, Texas.

Mark A. Earley, to Knotty Head team lead, Nexen Petroleum USA, Plano, Texas. Previously geophysical adviser, EOG Resources, Corpus Christi, Texas.

Tom W. Harrold, to senior staff geoscientist, Laredo Petroleum, Tulsa. Previously with Zenergy, Tulsa.

Alexandra "Alex" Herger, to director-international exploration and conventional new ventures, Marathon Oil, Houston. Previously director-worldwide conventional new ventures, Marathon Oil, Houston.

Nigel Hicks, to geophysicist, Chesapeake Energy, Oklahoma City. Previously geophysicist, BP America, Houston.

Mike Kisucky, to geologic adviser-new opportunities, Chevron Asia Pacific E&P, Rumbai, Indonesia. Previously senior staff petroleum geologist, Chevron North America E&P, Houston.

Tom Levy, to exploration adviser, integrated services for exploration, Schlumberger, Houston. Previously consultant, Houston.

David J. May, to senior geologist-unconventional resources, Chesapeake Energy, Oklahoma City. Previously vice president exploration, Torrent Energy, Portland, Ore.

Joe McShane, associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Stephen F. Austin State University, Nacogdoches, Texas.

Doug Melton, to Arkoma asset manager, Southwestern Energy, Fayetteville, Ark. Previously manager-Desoto geological operations, Southwestern Energy, Fayetteville, Ark.

R.I. "Bob" Moore, to president, Force 10 Resources, Calgary, Canada. Previously vice president-exploration and development, Crown Point Ventures, Buenos Aires, Argentina, and Vancouver, Canada.

Chris Persellin, to associate geologist, Chesapeake Energy, Oklahoma City. Previously student, Oklahoma State University, Stillwater, Okla.

James Pol, to senior staff geologist, Southwestern Energy, Houston. Previously senior geologist, Sanchez Oil & Gas, Houston.

Heather N. Ramsey, to geologist, Chesapeake Energy, Charleston, W.Va. Previously geologist, Anadarko Petroleum, The Woodlands, Texas.

Trent Rehill, to manager geology, Kulczyk Oil Ventures, Calgary, Canada. Previously senior staff geologist, Artumas Group, Calgary, Canada.

Robert Rieser, to senior geologist, Chesapeake Energy, Oklahoma City. Previously senior geologist, Schlumberger, Oklahoma City.

Allan Scardina, to chief geologist-new ventures, Shell, Rijswijk, Netherlands. Previously senior new ventures adviser, Shell, Rijswijk, Netherlands.

Robert "Bob" Tehan, to geological adviser, Linn Energy, Oklahoma City. Previously chief geologist and consulting geologist, Highmount E&P, Oklahoma City.

John Tintera, to executive director, Railroad Commission of Texas, Austin. Previously interim executive director, Railroad Commission of Texas, Austin.

Jim Wilson, to geoscience manager, Chesapeake Energy, Charleston, W.Va. Previously senior staff geologist, Cabot Oil & Gas, Charleston, W.Va.

(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

Clarence F. Balay Jr., 58
Houston, Feb. 18, 2009
Frederick D. Bingham, 80
Clarksville, Va., Feb. 7, 2009
Dean L. Cummins, 86
Colorado Springs, Colo.
March 1, 2009
Robert L. Maby Jr., 87
Houston, Feb. 3, 2009
Gene P. Morrell, 75
New Braunfels, Texas
March 3, 2008
Russell R. Simonson, 96
Carlsbad, Calif., Feb. 27, 2009
William T. Smith (AC '63)
Fort Worth
Oscar D. Weaver Jr., 85
Houston, Feb. 15, 2009
Louis R. Wilson, 94
Oklahoma City, Dec. 25, 2007
Leonard A. Wood, 86
Oakton, Va., Nov. 10, 2008

(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.)

A A P G F O U N D A T I O N

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WASHINGTONwatch

‘Energy Policy’ Process is Under Way

By DAVID CURTISS
GEO-DC Director

The plane was buffeted by gusty winds as it banked to line up with the runway, but with a steady hand the pilot guided our craft to a safe landing at Midland International Airport. It was my first trip to the heart of the Permian Basin.

The purpose of my visit was to speak at a Division of Professional Affairs (DPA) town hall meeting, providing an overview of GEO-DC activities and addressing specific policy issues that affect AAPG and DPA members.

Nearly 80 people gathered for drinks and hors d’oeuvres at the Midland Petroleum Club, hosted by DPA past-president Mike Party. DPA president-elect Paul Britt led off the evening with an overview of the division and its role within the Association and the profession. I followed with my talk on “The Shifting Sands of U.S. Energy Policy.”

I began with the history of GEO-DC and what AAPG is trying to accomplish in Washington, D.C.

I stressed that AAPG is a scientific and professional association, not a trade association. GEO-DC does not represent the petroleum industry. There are plenty of trade groups, such as the American Petroleum Institute and Independent Petroleum Association of America, to fill that role.

Instead, AAPG represents the science and profession of energy geology, with primary emphasis on petroleum. Our members include scientists and professionals working in industry, government and academia.


Curtiss

AAPG represents the science and profession of energy geology, with primary emphasis on petroleum.

As a result, our principal mission at GEO-DC is to bring our members’ collective scientific expertise and professional experience into the policy-making process to (we hope) result in better public policy.

* * *

The second part of the talk focused on the policy actions under way and proposed by the Obama administration and the 111th Congress, beginning with public land access.

Secretary of Interior Ken Salazar currently is undertaking a comprehensive assessment of the outer continental shelf (OCS) – with an extended public comment period until Sept. 21 – asking the Minerals Management Service and U.S. Geological Survey for an assessment of OCS energy sources, and holding a series of regional meetings in coastal areas to solicit stakeholder input.

Shortly after arriving at Interior, Salazar rolled back the oil shale research, development and deployment leases that the Bush administration had awarded in its “eleventh hour.” He opened a comment period on a new round of oil shale R&D leases, seeking stakeholder input.

The president’s budget for fiscal year 2010 proposed the repeal of the ultra-deepwater and unconventional research and development program, which, combined with the persistently inadequate funding of the Department of Energy’s oil and natural gas research programs, will result in insufficient investment in oil and natural gas R&D to meet future demand.

The FY2010 budget also included provisions seeking to impose a fee on non-producing acreage – a “use it or lose it” fee. It also proposed changes to the tax code, designed to raise $31.5 billion over 10 years. The changes include:

✓ Excise tax on Gulf of Mexico oil and gas production.

See **Washington**, page 39

✓ Repeal enhanced oil recovery credit.

✓ Repeal marginal well tax credit.

✓ Repeal expensing of tangible drilling costs.

✓ Repeal deduction for tertiary injectants.

✓ Repeal passive loss exception for working interests in oil and gas properties.

✓ Repeal manufacturing tax deduction for oil and gas companies.

✓ Increase geological and geophysical amortization period for independent producers to seven years.

✓ Repeal percentage depletion for oil and natural gas.

Commenting in written testimony presented to the House Energy and Water Appropriations Subcommittee on the policies proposed in the president’s budget, AAPG President Scott Tinker wrote:

“… Compounded by a weak economy and limited access to capital, these proposed policies on top of an already heavily taxed industry would have a chilling effect on oil and natural gas drilling, production and energy investment in this country, cost many jobs and directly undermine U.S. energy security.

“The U.S. tried this experiment from 1980-88 with the windfall profits tax which, compounded with the drop in

GEOPHYSICALcorner

Seismic Steps Aid Sequestration

(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 seismic reflectivity of CO_2 sequestration targets.)

By BOB HARDAGE
and DIANA SAVA

Sequestration of CO_2 in sealed brine reservoirs is an important issue in industrialized countries that are concerned about the impact of excessive atmospheric CO_2 on the environment.

Hardage

A general consensus is that long-term seismic monitoring of injected CO_2 will be essential for successful CO_2 sequestration programs.

In this column we consider the P-wave reflectivity associated with tracking a CO_2 plume in one reservoir considered for CO_2 sequestration.

* * *

Sava

The physical properties of injected CO_2 that affect seismic imaging are its density and acoustic propagation velocity at the pressure and temperature of its host medium.

Because CO_2 has a shear modulus of zero whether it is a gas or a liquid, shear-wave velocity in CO_2 is zero. The only velocity that has to be known for seismic modeling purposes is V_P, the propagation velocity of the P-wave mode in CO_2.

The density and P-wave velocity of CO_2 over a range of pressure and temperature conditions are defined by the curves displayed in figures 1 and 2, respectively.

An Earth model that defines reflecting interfaces at the top and base of the sandstone reservoir and at the fluid interface between CO_2 and brine internal to that reservoir is shown as figure 3. From available log data at this site, the Earth layers have the following petrophysical properties:

✓ Sealing carbonaceous shale: Δt_P = 65 μs/ft, ρ = 2.633 gm/cm^3.

✓ Reservoir sandstone: Δt_P = 80 μs/ft, ρ = 2.357 gm/cm^3, Φ = 22 percent.

✓ Granite basement: Δt_P = 55 μs/ft, ρ = 2.70 gm/cm^3.

The sandstone reservoir is at a depth of 6,000 feet; it is important to define the depth of the injection interval in order to determine the temperature and hydrostatic pressure that act on the sequestered CO_2.

This temperature and pressure, in turn, specify the density and V_P values that should be used to describe the seismic properties of the in situ CO_2 (figures 1 and 2). A factor of 0.433 psi/ft was used to convert target depth to hydrostatic pressure.

In utilizing the curves in figures 1 and 2, the in situ temperature was assumed to be 130 degrees Fahrenheit. These assumptions lead to V_P and ρ values of 1,285 ft/s and 47.0 lb/ft^3, respectively, for the sequestered CO_2.

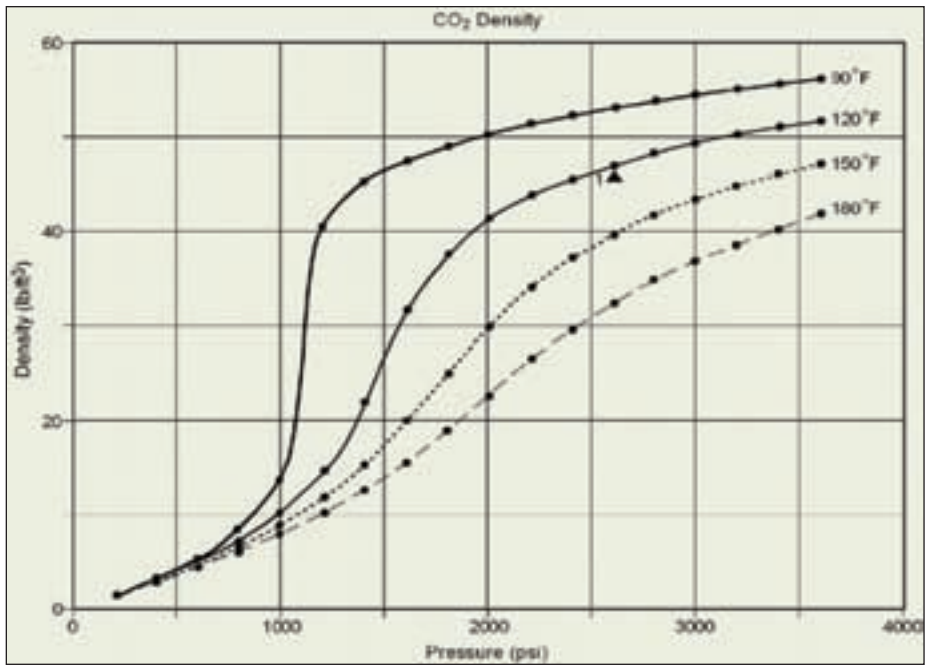

Figure 1 – Density of CO_2 for a range of pressures and temperatures. Numbered triangle 1 defines the value of CO_2 density used to model seismic responses at a CO_2 sequestration depth of 6,000 feet. As a reference, the density of water (1 gm/cm^3) is 62.43 lbs/ft^3.

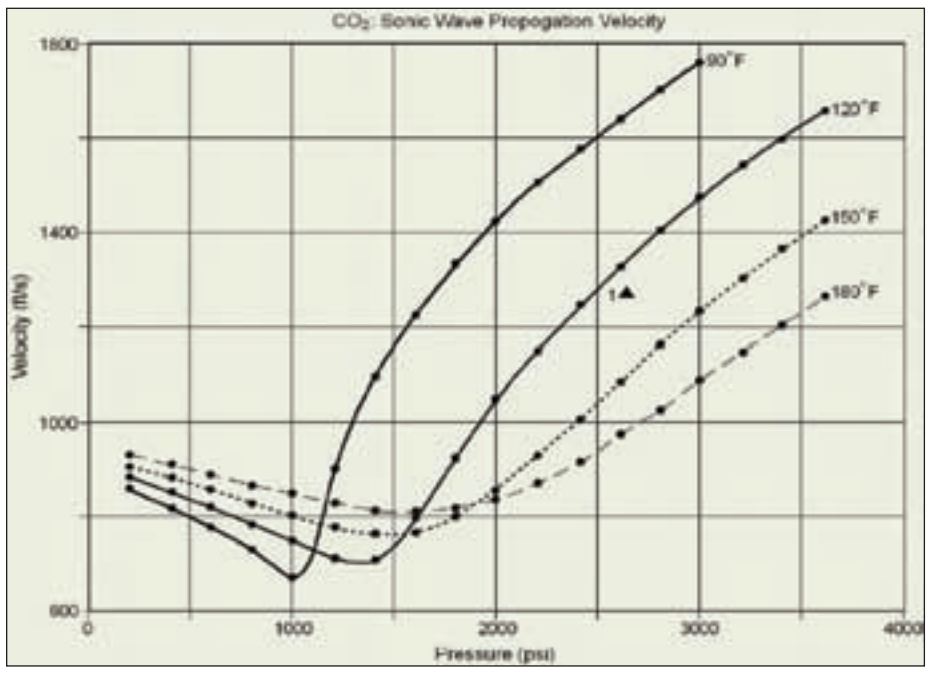

Figure 2 – P-wave propagation velocity in CO_2 for a range of pressures and temperatures. Numbered triangle 1 defines the velocity value used to model seismic reflectivity at a CO_2 sequestration depth of 6,000 feet. As references, the velocity in water is approximately 4,800 feet/second, and the velocity in air is 1,100 feet/second.

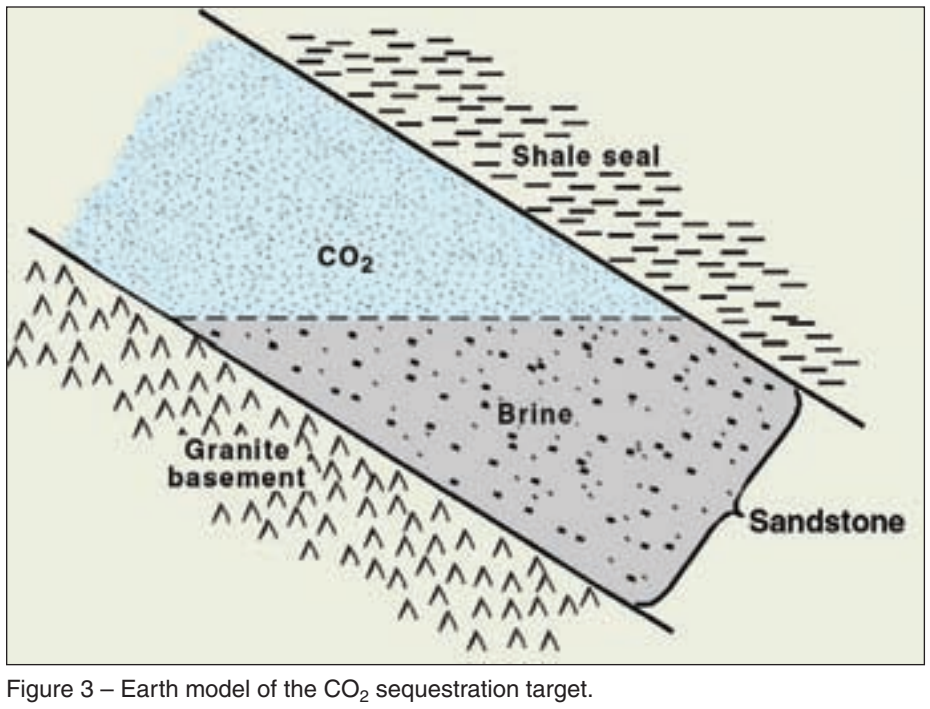

Figure 3 – Earth model of the CO_2 sequestration target.

* * *

Two reflectivity curves are calculated for the top and base of the reservoir:

✓ One curve describes the reflectivity of a brine-filled reservoir unit.

✓ The second curve describes the reflectivity of a reservoir that has a CO_2 saturation of 100 percent.

These reflectivity curves are shown as figures 4a and 4c (next page). The reflectivity at the brine-CO_2 contact is defined by the single curve in figure 4b.

Examination of figure 4 shows that P-P reflectivity increases by about 20 percent at the top of the reservoir when brine is replaced by CO_2. This brightening of the P-P reflection can be detected only if good-quality seismic data are acquired and if seismic data processing is carefully done.

For this particular geologic layering, the P-P reflection from the interface at the base of the reservoir does not vary when brine is replaced by CO_2 (figure 4c).

* * *

An encouraging result is that there should be a measurable P-P reflection at any brine/CO_2 contact boundary that is created within the reservoir unit. Figure 4b shows that P-P reflectivity at the brine/CO_2 boundary is 3 percent to 6 percent.

Comparing this fluid-contact reflectivity with the P-P reflectivity at the top and base of the reservoir indicates that a P-P reflection from a brine/CO_2 interface will be one-third to one-tenth the magnitude of the reflection amplitudes from the upper and lower interfaces of the sequestration interval.

Again, this smaller fluid-contact reflection response can be detected only if good-quality seismic data are acquired and great care is used in processing the data. An additional requirement is that the distance from the fluid interface to both the top and the base of the sequestration interval should be more than half the dominant wavelength of the illuminating wavefield.

In amplitude-versus-offset (AVO) parlance, the top of the reservoir is a Class 4 AVO interface (figure 4a), and the fluid-contact boundary is a Class 3 AVO interface (figure 4b). These differing AVO behaviors allow a valuable data-processing strategy to be implemented. Two P-P seismic images need to be made: Image 1 would use only small-offset data (incidence angle range between 0 and 20 degrees), and Image 2 would utilize only large-offset data (incidence angles between 20 and 50 degrees).

In Image 1, the reflection from the top of the reservoir will be five to six times greater than the fluid-contact reflection. In Image 2, the reflection from the top of the reservoir will reduce and will be only two to three times brighter than the fluid-contact boundary.

The reflectivity behaviors in these two images should allow a fluid-contact boundary to be identified.

* * *

For simplicity, this modeling assumes that the pore space in the sandstone reservoir is filled with either 100 percent brine or 100 percent CO_2. In reality, the pore space will be occupied by various

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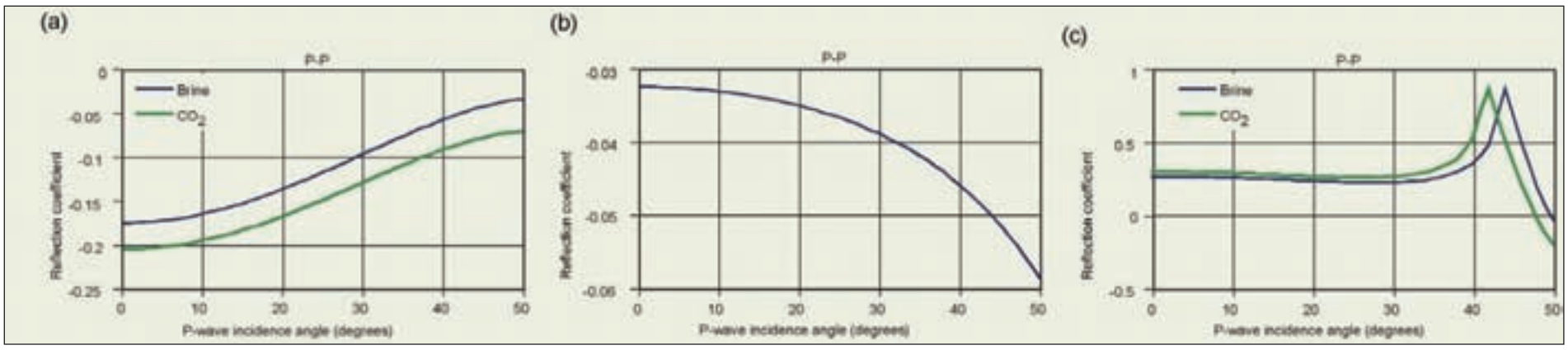

Figure 4 – (a) P-wave reflectivity at top of reservoir; (b) P-wave reflectivity at brine/CO_2 interface; (c) P-wave reflectivity at base of reservoir

continued from previous page

percentage ratios of brine and CO_2.

Our only purpose here is to emphasize that a detailed seismic modeling should be done to determine the viability and strategies of seismic monitoring of injected CO_2 before any CO_2 sequestration project is initiated.

Some CO_2 plumes may require that careful and precise procedures be implemented for monitoring plume growth, as in this case.

Appropriate modeling can show if a CO_2 plume in another geologic setting will be easier to image. ❑

(Editor's note: Diana Sava, like Hardage, is with the Bureau of Economic Geology in Austin, Texas.)

Washington

from page 36

price of oil in the '80s, had a disastrous effect on drilling, industry employment and U.S. energy production for nearly two decades to follow.

"We face a very similar price situation now," he continued, "and cannot afford to repeat an experiment that has already been tried and failed."

It is important to remember that the provisions in Obama's budget are just proposals. Congress holds the federal purse strings and decides from whom tax dollars are collected and how they are spent.

This process is just beginning.

* * *

GEO-DC will continue informing policy with science, and educating law-makers on the consequences of their actions.

Based on the Association's statements we will support tax and public land use policies that encourage exploration and production – that is good public policy. We also will continue to support robust energy R&D, especially in oil and natural gas.

But in a representative democracy, there are limits to what our office can accomplish. In fact, one of our primary responsibilities is to develop ways for you as members and individual constituents to get involved. You are the key to communicating the message to Congress.

When considering next steps, I suggested to the Midland audience that the situation demands their personal engagement and action. We all should contact our elected officials by phone, e-mail or a personal visit to their local offices.

It is essential that we encourage colleagues and friends to also get engaged, particularly if they live in a state that does not have a large oil and natural gas community. The DPA has posted some helpful resources on its Web page on other ways to get engaged on this issue.

Alexis de Tocqueville reportedly said, "[i]n a democracy, the people get the government they deserve." It is not time to panic. It is also not time for complacency. Get involved and work hard to ensure that your legislator understand the consequences of their actions.

As we look forward, the stakes are high but the task is clear. Now let's get to work. ❑

WWWupdate

EXPLORER Gets Web Makeover

By JAMIE EDFORD
Web Site Editorial Assistant

The AAPG EXPLORER's online edition has undergone a makeover just in time for spring, and has been redesigned from the ground up.

Inspired by the standards readers have come to expect from prominent online news sites, the Web EXPLORER's sleeker layout is more consistent and easier to read and print. It also has been optimized for use on mobile devices.

The EXPLORER home page is a quick guide to everything: subscription and advertising information, most popular stories (according to Google Analytics), submission information and links to archives and as well as the current issue.

Each issue's index is focused only on that month's content, making it easier and faster to find information.

Larger photographs and a slideshow gallery-style display of multiple graphics give a more convenient viewing experience, while not interrupting the text flow.

Many of the new features can be found in the sidebar.

Related Stories uses keyword searching and the power of Google to highlight past EXPLORER stories on similar topics – and with a single click opens a new page for more in-depth searching of past issues.

Explorer Search, available on every page, searches only the EXPLORER archives (rather than the entire AAPG Web site).

Add This … Really!

The most significant new feature harnesses the power of social bookmarking using AddThis, an interactive feature that allows you to easily add stories to various social networking sites such as Delicious, StumbleUpon or Digg.

These services allow users to share and review Web sites, news stories and blog articles of interest and see what Web content is popular among their friends and the Web at large.

For example, AAPG Web sites have been bookmarked multiple times on Delicious, and a search for AAPG on StumbleUpon or Digg brings up dozens of entries and reviews.

It's a quick and easy way for AAPG to see what's gaining attention among Web users and for our readers to find more related content.

AddThis also gives one-click access to print and e-mail stories.

Archives Expanded

Beyond the individual story pages, the column and EXPLORER issue archives are now chronologically listed, with more information than ever featured on the index pages – such as author names and issue focus.

It's also now easier than ever to leave your comments for the editor. At the bottom of each page is an interactive comment form that appears with a click (it is otherwise hidden to minimize load time and optimize the viewing experience).

Harnessing the power and features of Web 2.0 technology has given the EXPLORER not just a new look, but more informational value than ever before by linking stories not just to EXPLORERs past and present, but to the entire World Wide Web. ❑

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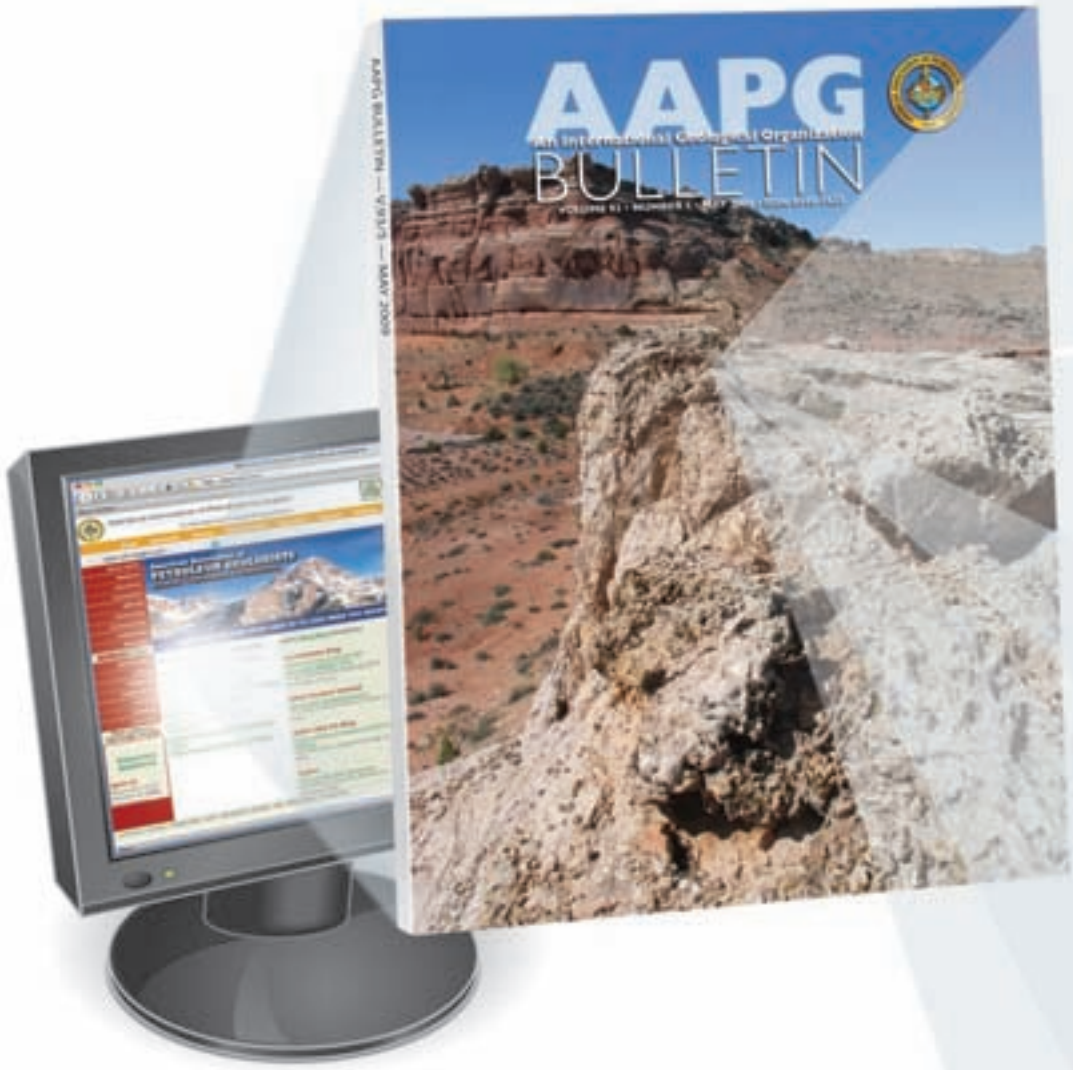

Ozona Basin Depositional History

H. Scott Hamlin

Wireline logs and cores were used to map the genetic stratigraphy and reconstruct the deposition and tectonic history of the Ozona sandstone, Texas, during the final phase of the Ouachita orogeny. Foredeep migration in the Ozona sandstone provides a predictive tool for locating reservoirs in adjacent basins and similar deepwater basins worldwide.

Hot, Deep Porosity

Anna Berger, Susanne Gier, & Peter Krois

The lower Goru Formation of the Cretaceous Sawan gas field, Pakistan, consists of shallow-marine volcaniclastic sandstones that exhibit anomalously high porosity and permeability. This resulted from pore-lining chlorite cement that inhibited quartz cementation and preserved primary porosity, resulting in overall good permeability.

Imaging the Effects of Halokinesis

Tiago M. Alves, Joe Cartwright, & Richard J. Davies

Much of the previous work on salt-sediment interactions is based on relatively lower-quality seismic data. High-quality 3D seismic reflection data from the Espírito Santo Basin, Brazil, are used to better investigate the role of halokinesis on normal fault and deepwater channel development.

Moab Fault Fluid Flow

Peter Eichhubl, Nicholas C. Davatzes, and Stephen P. Becker

Fault-related diagenesis is mapped to identify sealing and conductive segments of the Moab Fault, east-central Utah, providing an indication of paleo-flow and highlighting the complex interaction of fault architecture and diagenetic sealing processes in controlling hydraulic properties in this setting.

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.com/may_bulletin

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

REGIONS&sections

Face-to-Face Makes a Difference

(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 CAROL McGOWEN
Regions and Sections Manager

With the many means of electronic communication now available, one might wonder whether there is much interest in holding meetings during AAPG's Annual Convention and Exhibition in Denver.

Judging by the seven meetings scheduled over the two-day period of June 8-9 (Monday-Tuesday), however, AAPG's Section and Region leaders still find face-to-face meetings an indispensible tool for exchanging ideas and advancing the work of the Association.

Several committees hold monthly teleconferences, but meeting face-to-face at ACE and ICE helps networking and new members to feel comfortable with their colleagues. It also allows issues to be wrestled within a manner not easily afforded by e-mail or over phone lines.

Africa Region

The Africa Region leadership team will use their meeting on June 8 to bridge the vast geographic distance of their respective locales.

The Denver meeting marks the completion of this diverse team's first year of service to the AAPG Africa Region. The meeting agenda features a preview of the Region's new Web site and e-newsletter, a review of the Region's 2009 Imperial Barrel Award competition and plans for IBA 2010. A group discussion will identify ways to strengthen existing student chapters and establish new ones.

Consideration of a process for establishing country representatives in each African country with at least one AAPG member will round out the meeting.

Eastern Section

Final preparations for the Section's annual meeting (Sept. 20-22 in Evansville, Ind.) tops the agenda for the ES Council meeting on June 8. Eastern Section officers, delegates and affiliate society presidents are invited.

Other agenda topics include improvements to the archival of talks presented at the Eastern Section meetings, whether to develop a Web site and how to develop a cadre of speakers from the Section who are willing to give talks at local colleges and other venues.

Sections Committee

As AAPG continues its evolution as a global organization and a new AAPG corporate structure is considered, the role of the Sections Committee is vital to the process.

Alignment of the Sections with AAPG's global initiatives will be a key topic during the Sections Committee June 8 meeting. All Section officers and committee chairs are invited to join W.C. "Rusty" Riese, AAPG's vice president-Sections, for this important discussion.

Other issues to be discussed include how to engage the many geologists who work in the Sections but who are not AAPG members, and ideas for improved, more frequent communications – "connectivity" among the local societies, Sections and AAPG headquarters.

Latin America Region

The Latin America Region will welcome the AAPG International Conference and Exhibition in Rio de Janeiro this November, and the Region's June 8 meeting will help organize volunteers and further prepare for the conference. All AAPG Latin America Region members are encouraged to attend.

The Region faces a challenge of how to motivate cross-country interaction within Latin America. To address this challenge, candidates will be nominated to fill vacant or expiring officer positions on the Region Steering Committee. To support the newly elected Region Steering Committee, a point contact in each Latin American country will be identified. Other important business includes raising topics for Distinguished Lecturers and short courses within the Region.

Mid-Continent Section

The Mid-Continent Section Council will meet on June 9 to discuss:

- ✓ Scholarships.
- ✓ Teacher of the Year,
- ✓ AAPG student chapters.
- ✓ Imperial Barrel Award competition.
- ✓ The Section's next annual meeting, set Oct. 10-14 in Tulsa.
- ✓ Finances within the society.

Any active member of the Section is

continued on next page

IBA Sponsorships Slots Still Available

The semifinal competitions for this year's Imperial Barrel Awards competition are coming to a close, which means 10 student teams from around the world are getting ready for the IBA finals competition in June 5 in Denver – one day before the official start of this year's AAPG Annual Convention and Exhibition.

AAPG's IBA Program is an annual prospect/exploration evaluation competition between university student teams who use real data, with the top team winning $20,000 for their petroleum geoscience department.

The IBA depends on corporate sponsorship to help meet the program's goals – and opportunities still exist for companies that want to be part of the program.

For more information on sponsorship opportunities go to www.aapg.org/iba; or contact Mike Mlynek (mikem@aapg.org) or IBA Sponsorship chair Erik Mason (Erik.Mason@shell.com).

continued from previous page

invited to sit in and bring new business before the council, but only members of the council will have voting privileges.

International Regions Committee

The IRC is a forum for leaders of the international organization to communicate needs of the global membership, share best practices and thereby improve service delivery.

The annual meeting is a good opportunity to identify one or two global initiatives in which all the regions can participate and leverage off AAPG's strong domestic resource base.

Over the years the IRC has worked with other committees to introduce the Distinguished Lecturer, Visiting Geoscientist and Student Chapter programs globally, as well as making regionalization a reality, developing a track record of successful international conferences and evolving regional Web sites of consistently high quality.

More recently IRC has worked to assure strong representation of internationals in the HoD, the standing committees and in the leadership councils of the Divisions and further upgrade our Web sites.

Key focus areas for the forthcoming Denver IRC meeting will be sharing ideas on creating a "country-by-country" contact structure to assure good communication and service delivery across the organization. Highlighted will be Regions best practices, along with a status report on the Global Corporate Structure and Regional Incorporation.

There also will be updates on the International Pavilion, student activities and how well the Divisions are doing in the Regions.

Each region is asked to present the two biggest issues confronting each of them. From this, one or two key projects may crystallize that IRC can focus on and pursue as a team over the next 12 months.

Canada Region

Last year, in lieu of a traditional business meeting, the Canada Region planned a small social gathering – and attendance was twice the number expected.

Based on that success, a similar social event is scheduled on Tuesday evening, June 9. Invited are all Canadian AAPG members, the Canada IBA team, Canada regional IBA judges, the Canadian winners of AAPG awards and Canada Region students, who will have a great networking opportunity by attending.

A brief annual general meeting will be held during the social.

* * *

Still doubtful about whether face-to-face meetings are really needed? Come join one of these Region or Section events in Denver and judge for yourself! ❑

The technical program has been set for AAPG's 3P Polar Petroleum Potential conference, set Sept. 30-Oct. 2 at Moscow's All-Russia Exhibit Center. "3P" will offer an intense look at the geology and exploration potential of the entire Pan-Arctic area – including Greenland, shown above. Go to www.aapg.org for the lastest information.

Abstract Deadline Set for GEO 2010

Abstracts are now being accepted online for GEO 2010, AAPG's next Middle East Geosciences Conference and Exhibition, which will be held March 7-10 in Manama, Bahrain.

The conference theme will be "Innovative Geoscience Solutions – Meeting Hydrocarbon Demand in Changing Times."

Nine technical topic themes have been announced for the event, which as in past years will be sponsored by AAPG and several other geoscience groups. The biannual GEOs have become the region's premier "geo" event.

Technical topics are:

✓ Engaging Future Generations.
✓ Technologies to Solve Complex Reservoir Challenges.
✓ Reservoir Characterization.
✓ Advances in Geophysics.
✓ Next Generation Technologies.
✓ Petrophysics.
✓ Geological Studies and Basin Modeling.
✓ New Play Concepts in Exploration and the Role of Risk Management and Innovation.
✓ Harvesting Unconventional Resources.

The abstract deadline is July 7.

To submit an abstract, or for more information go to www.aapg.org.

AAPG President Scott Tinker (third from right) and members of "The Bridge" documentary film crew take a break on the landing deck of the RasGas Alpha offshore production facility in the Arabian Gulf north of Qatar; natural gas from the nearby Khuff Formation supplies the LNG facilities in Qatar. The AAPG Foundation has established a new fund to help meet the film's production costs.

FOUNDATIONupdate

A new AAPG Foundation fund has been established in support of a full-length documentary that is being made to help alert and inform the world of future trends in energy use and production.

"The Bridge: Our Fossil Path to Alternative Energy" is a production that is being shot at locations around the world, featuring AAPG President and Trustee Associate Scott Tinker.

The Foundation's "Bridge Fund" also will support a Web site on the same subject.

Contributions to the "Bridge Fund" – or any AAPG Foundation fund – are tax-deductible as specified under U.S. tax laws.

For more information about the funds or to make a contribution contact Foundation manager Rebecca Griffin at 918-560-2644, or go online to http://foundation.aapg.org/donate.cfm.

* * *

The Trustee Associates will be busy at the AAPG Annual Convention and Exhibition, set June 7-10 in Denver. Upcoming TA events at the Denver annual meeting include:

✓ Members of the Corporation and Board of Trustees are scheduled to meet at 1:30 p.m. on Monday, June 8.

✓ Foundation Chairmen's Reception will be held at 5 p.m. on Tuesday, June 9.

* * *

On the road again: The Trustee Associate luncheons not only spread the word about Foundation activities but also are helping to bring in more TA members.

Recent guests at the Ft. Worth and Denver luncheons who accepted invitations to join the group include:

❒ William A. Monroe, Ft. Worth.
❒ John D. Humphrey, Golden, Colo.

They bring the Trustee Associates membership to 268.

Foundation (General)
William J. Barrett
Chevron Humankind
Matching Volunteer Grant: Janet W. Yun
Steven Gerald Kirkwood
George Raymond Macaulay Jr.
In memory of Clyde T. Metz
Amy Leigh Maldonado
Charles John Mankin
James S. McGhay
William Allen Monroe
Harry Ptasynski
In memory of Russ Simonson
John H. Van Amringe
In memory of Edward A. Hall

Awards Fund
Search and Discovery Award
Willard R. Green
In honor of John W. Shelton; In memory of Frank D. Kozak

Bridge Fund
Gretchen M. Gillis
In honor of Scott Tinker

Digital Products Fund
The Ohio State University
Michael Sam Johnson
In memory of Edmund M. Spieker

University of North Dakota
Bret John Fossum

Grants-in-Aid Fund
Chevron Humankind
Matching gift from Chris A. Oglesby

Bernold M. "Bruno" Hanson Memorial Environmental Grant
Donald A. O'Nesky
In memory of Eric Hanson

Wallace E. Pratt Memorial Grant
Denis Edward Foley
In memory of Edward J. Foley and Walter Spangler

K-12 Education Fund
Chevron Humankind
Matching gift from Donald A. Medwedeff
Hans Henning Krause

E.F. Reid Scouting Fund
Paul H. Dudley Jr.
In memory of Eugene Reid

It's like a crash course in career advancement.

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September 21-25, 2009 / Norris Conference Center / Houston, Texas

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- Risk Analysis & Decision Making in E&P
- Petroleum Resources & Reserves: An Overview of Recommended Geological Practices
- Decision Methods and LNG Value Chain
- Creativity in Exploration
- Knowledge Transfer in the Multi-Generational Workplace
- Keys to Complex Well Economic Success
- Think on Your Feet—The Importance of Clarity, Brevity and Impact™
- The Energy Industry from the Investor's Perspective: How will the new policies affect investment strategies?
- Exploration Success and Failures from Pore Pressure Assumptions
- Farm-ins and Farm-outs for Explorationists

TO REGISTER, OR FOR MORE INFORMATION, CALL 888-338-3387 OR VISIT WWW.AAPG.ORG/FEC

$1595 (AAPG Members) • $1695 (Non-Members) • Price increases $100 after August 24, 2009

Courses may be purchased individually.

www.aapg.org/fec

More science than you can shake a pick at.

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
Clark, Julian David, Chevron, San Ramon (M.D. Sullivan, A. Fildani, T.R. McHargue); **Peltonen, Christer B.**, Venoco, Carpinteria (M.D. Wracher, M.J. Kamerling, W.L. Bilodeau)

Colorado
Kyle, Linda S., Anadarko Petroleum, Thornton (D.M. Goldstein, T.B. Beserra, A.J. Meyer); **Lewis, Russell Kristofer**, El Paso Exploration & Production, Denver (E.R Gustason, J.M. Borer, J. Nettik)

Louisiana
Helms, Travis Adam, James F. Hardwick and Associates, New Iberia (G.K.P. Munson, M.E. Broussard, T.J. Bennett)

New Mexico
Petronis, Michael S., New Mexico Highlands University, Las Vegas (J.A. Roberts, E.A. Beaumont, T.F. Wawrzyniec)

Ohio
Foley, Kelly Kristine, Luca Technologies, Powell (J. Burris, L.M. Reeves, B. Lyons)

Texas
Arcuri, Terry, Murphy Exploration & Production, Houston (G.W. Coburn, C.D. Scharpf, S. Harden); **Casey, Brian J.**, Occidental Oil and Gas, Houston (G.W. Woodhouse, D.D. Ryan, R.J. Bottinga); **Kaufman, William Harold**, Texpetro Global Ventures, Garland (M.W. Downey, H.R. Duchene, M.E. Anglin); **McMaster, Glenn**, ConocoPhillips, Houston (W.C. Riese, G.P. Citron, P.D. Carragher); **Olive, Don Paul**, consultant, Midland (J.M. Party, E.M. Sebring, W.R. Creech); **Scull, David M.**, Strandline Consulting, Dallas (T.G. O'Hare, D.R. Essler, D.P. Muth); **Welch, John Patrick F.**, EOG Resources, Midland (M.J. Party, R.P. Richards, J.J. Chapman Jr.)

Virginia
Shaw, Sarah Rebecca, Southwestern Energy, Sterling (R.W. Wells, E.H. Mason, N.M. Drumsta)

Bangladesh
Baqi, M. Abdul, Bangladesh Petroleum E&P, Dhaka (A.M. Shamsuddin, P.W. Baillie, P.M. Lloyd)

Brazil
Elias, Andreia Regina Dias, Petrobras, Rio Grande do Sul (N.C. Azambuja Filho, M.R. Mello, W.U. Mohriak)

Canada
Blair, Maren Leigh, Sproule Associates, Calgary (J.L. Chipperfield, M.W. Maughan, G.D. Strother-Stewart); **Torres Hernandez, Vladimir**, Sproule International, Calgary (D.J. Carsted, B.F. Jose, G.D. Strother-Stewart)

England
Cutts, Andrew, WesternGeco, Gatwick (G.M. Gillis, R.J. Davis, K.S. Glaser);**Drachev, Sergey**, ExxonMobil International, Leatherhead (I. Berczi, D.R. Cook, J.R. Hogg); **Higgs, Karen Elizabeth**, self-employed, Colwyn Bay (B.D. Field, R.H. Funnell, P. Barnard); **Hosein, Karize Aruna**, Nexen Petroleum UK, London (F.L. Hayes, D.E. Gagnon, R.T. Newrick); **Wood, Charlie**, Perenco, London (M.O. Bowyer, P. Durbin, H.D. Johnson)

Indonesia
Rahman, Apziarief, Medco International, Jakarta (N. Guritno, W.A. Gajkowski, B. Sapiie)

Jamaica
Wright, Raymond Marcio, Petroleum Corporation of Jamaica, Kingston (reinstate)

Japan
Nabetani, Atsushi, INPEX Corp., Tokyo (K. Takayama, H. Arato, H. Honda)

continued on next page

Certification

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

Petroleum Geologist

Colorado
Ronald J. Staskowski, Exploration Signatures, Fort Collins (A. Carvalho, S. Sonnenberg, J. Everett)

North Carolina
James Eugene Brown, independent petroleum geologist, Fletcher (E. Trice III, S. Burke, D. Alderks)

Texas
William C. Burkett, consulting geologist, Midland (Society of Independent Professional Earth Sciences); **Jerry Herman Dunnam**, consultant, Midland (Society of Independent Professional Earth Sciences); **Ted F. Gawloski**, Concho Resources, Midland (J.M. Party, G. Hoose, D. Harmon); **Ronald O. Johnson**, Samson Resources, Midland (J.M. Party, D. Osborne, R. Worthington); **John E. Kimberly**, Grand Banks Energy Co., Midland (Society of Independent Professional Earth Sciences); **Richard D. Lathrop**, consulting geologist, San Antonio (reinstatement); **Michael A. Oestmann**, Piedra, Midland (J.M. Party, R. Worthington, D. Harmon); **Russell Paul Richards**, Great Western Drilling Co., Midland (S. Ingram, H. Naumann Jr., P. Lufholm)

Petroleum Geophysicist

Texas
Benjamin Earl Winkleman, Energy Partners, Houston (Society of Independent Professional Earth Sciences) ❑

It's time to renew

Membership Benefits a Bargain

By VICKI BEIGHLE
AAPG Membership Manager

It's annual dues times – and perhaps a good time to remind everyone that AAPG offers a plethora of benefits. So many, in fact, that you may be missing out on some of the rewards of membership.

All members likely are aware of their publications benefit – because the EXPLORER and BULLETIN arrive every month – but there's much more.

For example:

✓ Members receive discounts on bookstore purchases, meeting registrations, short courses and field trips.

✓ Active members can vote in officer elections, sponsor Active applicants to join or chair a committee. And Active members who are 65 and have a minimum of 30 years of cumulative membership can request Emeritus status – and then save 50 percent on their annual dues and registration fees for ACE and ICE.

✓ Active and Associate members have online access to all BULLETIN archives; student members have access to the previous two years.

✓ The newest benefit is the Career Center (careercenter.aapg.org), our resume/job posting service, where members also can sign up for the Member Registry list their experience and areas of interest – and search for other members who share these interests.

✓ AAPG members can apply for membership in one or all of our divisions: Division of Professional Affairs (certification of professional geologists, petroleum geophysicists and coal geologists), the Energy Minerals Division and the Division of Environmental Geoscientist.

Need info on these? Contact Norma Newby at 918-560-2613, or nnewby@aapg.org.

✓ There are personal benefits, too, like access to life/health/auto/home insurance and car rental discount.

Complete details of AAPG's membership benefits are available online at www.aapg.org/member/handbook/index.cfm.

Perhaps one of the most important benefits is belonging to a professional community of geoscientists who share the same passion and dedication to advance the science of geology, foster scientific research and promote technology.

And we all want to keep a good thing going, right?

Renewal of your annual dues and contributions to the AAPG Foundation helps us maintain current programs and services and unearth new opportunities.

So remember: Renew before July 1 to keep your membership in good standing. Members paying with a credit card can renew online at www.aapg.org/dues/, or via fax to 918-560-2694.

Remember, too, to include your full name and member number.

Of course, you can return your dues statement and payment the traditional ways – via mail or by calling AAPG headquarters at 918-584-2555.

And if you know someone who is a potential member you can help them to join by downloading forms from www.aapg.org/join – or applicants can apply online.

Finally, remember that by recruiting someone for Active membership (new, reinstate or transfer) you will receive points that can be redeemed for prizes. You receive reward and recognition for recruiting – and your colleague receives the benefits of membership.

More questions? Contact us at either 918-584-2555, or members@aapg.org. ❑

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Kuwait
Bugti, Muhammad Nawaz, Schlumberger, Kuwait (T.S. Hasany, A. Waheed, N.K. Siddiqui)

Malaysia
Goring, Ken Larry, Shell Exploration & Production, Miri, Sarawak (J.E. Laing, R. Franssen, G. Stone)

Mexico
Ponte-Filho, Francisco Celso, Schlumberger-DCS, Boca del Rio (N.C. Azambuja Filho, M.R. Mello, L.P. Magnavita)

Norway
Akalin, A.Hamit, StatoilHydro, Bergen-Sandsli (N.F. Hurley, T.L. Davis, H. Sarikaya); **Harstad, Andreas Olaus**, DNO International ASA, Oslo (K.O. Bjorlykke, J.S. Jahren, R.H. Gabrielsen)

Saudi Arabia
Almousa, Ahmed M., Saudi Aramco, Dhahran (J.L. Rice, M.J. Rademakers, E.D. Gustafson Jr.); **Teng, Mee Kee**, Saudi Aramco, Dhahran (J.L. Rice, H. Xiao, Y.H. Hu)

Turkey
Yilmaz, Sule, N.V. Turkse Perenco, Ankara (M. Atalay, C. Ozdil, U. Tezcan)

Vietnam
Chuong, Pham Vu, Salamander Energy, Ho Chi Minh (R.G. De Lastic, W.J. Schmidt, M.J. Buck); **Woodhouse, Ratih Nurruhliati**, self-employed, Hanoi (H. Darman, S.W. Reksalegora, M.A. Firmansyah) ❑

UPCOMING REGIONAL WORKSHOPS

PTTC TECHNOLOGY CONNECTIONS Powered by AAPG

5/15 **Rocky Mountain**: GeoGraphix Training; An Overview and Refresher Course – Golden, CO. Contact: 303-273-3107

5/19-20 **Central/Eastern Gulf**: Louisiana Oil and Gas Symposium (Baton Rouge Geological Society, Louisiana Geological Survey, LSU Center for Energy Studies, Louisiana Oil and Gas Association) - Baton Rouge, LA. Contact: 225-578-4538

Keys to Complex Well Economic Success

5/14 **Eastern** - Morgantown, WV. Contact: 304-293-2867 x5443

5/19 **Midcontinent** - Oklahoma City, OK. Contact: 918-241-5801

5/21 **Rocky Mountain** - Denver, CO. Contact: 303-273-3107

6/3-4 **Texas/SE New Mexico**: CO2 Operations - Houston, TX. Contact: 512-471-0320

6/6-7 **Rocky Mountain**: Uranium Geology and Geochemistry, Golden, CO (PTTC sponsored @ AAPG)

6/11 **Rocky Mountain**: Descriptive Lithology: Analysis of Cuttings and Cores, Golden CO, Dr. Robert Merrill, (PTTC sponsored @ AAPG)

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

READERS' forum

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.

Wake Up

I want to thank and acknowledge President Scott Tinker after reading his column ("Should I Stay or Should I Go?") in the April EXPLORER.

Having 30-plus years exposure to the petroleum business and being a second-generation oil person, I now find myself talking to my two sons about their future. They are in the process of having to choose a college major – both are leaning toward the earth sciences, but are skeptical about the future based on what has happened in the recent past.

I love the crazy pursuit of oil and gas and will always keep at least one eye on the business. However, I'm thinking my sons probably will go in a different direction, in part because of what Washington is considering doing to our beloved business. I suspect that there are many other young people considering a different direction, and that is pretty sad.

Wake up Washington, indeed.

K. Paul Cash
Sunnyvale, Texas

The Rest of the Story

Regarding the story "Prudhoe Bay Took 'A Total Team'" (March EXPLORER):

My involvement with Prudhoe Bay was as a consultant both before and after the drilling of the discovery well.

I read with interest John Sweet's account of the team effort leading to the drilling of the Prudhoe Bay discovery well. I have no reason to doubt Mr. Sweet's account of the recommendations emanating from Arco's Anchorage office.

I think it is important, however, to point out some facts that were omitted from the article:

✓ Arco's first wildcat on the North Slope was the No. 1 Susie, a dry hole drilled prior to the No. 1 Prudhoe Bay. One must conclude this was Arco's best geophysical prospect, since it was drilled first.

✓ Because the drilling contract called for Arco to pay for shipping the drilling rig back to Seattle, it was cheaper to drill another well, the No. 1 Prudhoe Bay, than send the rig back. (Personal conversation with Robert O. Anderson, Arco's then chairman of the board, and a friend.)

✓ The most attractive reservoir characteristics that are exposed in the sedimentary section in the Brooks Range are found in the Lisburne formation of Mississippian age, which was the main objective of the No. 1 Prudhoe Bay wildcat.

Although the Lisburne does produce some oil in the Prudhoe Bay field it is of minor importance. The pleasant surprise was the excellent subsurface reservoir characteristics developed in both the Sadlerochit and Shublik formations.

Bill LeMay
Aiken, S.C.

(Editor's note: The March EXPLORER article was an excerpt from Sweet's book "Discovery at Prudhoe Bay," published by Hancock House and available through the AAPG Bookstore.)

Some Suggestions

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, must open these areas for exploration and development. Time is of the essence.

Dick Baile
Houston

MEETINGS of note

2009 U.S. Meetings

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2009 International Meetings

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

Sept. 16-18, Polar Petroleum Potential (3P), conference, Moscow, Russia.

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

EMD

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EMD Short Courses

❒ Keeping You at the Top of Your Game

✓ Shale Gas I and II: Geochemical and engineering predictions of shale reservoirs; key parameters and data relationships that define productive gas shale's.

✓ Uranium Geology and Logging Techniques for Uranium Exploration.

✓ Integrated Structural/Tectonic Studies of HRAM Data for Resource Play Analyses.

✓ National Petroleum Reserve Core Workshop – Lower Cretaceous clinoforms with basin floor source rocks through thick, gaseous coalbeds with reservoirs in-between.

EMD Field Trips

✓ Gas Shales, Oil Shales, Coalbed Methane and Tight Gas Reservoirs in the Piceance Basin.

✓ Coal Bed Methane, Raton Basin, Colorado and New Mexico.

✓ Remote Sensing, Climate Change and Planetary Science Facilities.

Forum (EMD, DPA, DEG)

✓ Carbon Dioxide Sequestration and Future Energy Sources (Wind, Solar and Nuclear).

EMD Luncheon

Jeffrey S. Kargel, adjunct professor and senior research scientist in the Department of Hydrology and Water Resources at the University of Arizona, will be the speaker for this year's EMD Luncheon, set for Wednesday, June 10.

Kargel will astonish us and feed our imaginations with a talk titled "Unconventional Far-Out Petroleum and Gas: Hydrocarbons from Mars to Titan and Beyond."

Kargel will pose the question of whether we are too terracentric in thinking that Earth is the only abode of biogenic petroleum and gas. Today, methane rain pours over Titan's surface, erodes river valleys and fills lake basins while carbonaceous aerosols drift down from the upper atmosphere. Speculatively, acetylene glaciers may scour Titan's poles and benzene sand dunes blanket the dry equatorial basins. Volatile hydrocarbons cause comets to jet and split, and help power geysers on Saturn's tiny moon, Enceladus.

A prolific author of two books and multiple peer-reviewed papers, chapters, articles and abstracts, Kargel believes that hydrocarbons certainly are treasure-troves of scientific information on the history of the solar system.

Please join us for what will be a stimulating and titillating presentation!

This entire EMD program was organized by numerous volunteers: EMD Executive Committee members and past members, EMD commodity chairs and counselors, and all the oral and poster session co-chairs. Thanks to all of you for your diligence and assistance in putting together a program that features the essence of the Energy Minerals Division.

We hope that you will be able to join us in Denver! ❑

CLASSIFIEDads

POSITION AVAILABLE

Post-Doctoral Research Associate
Clastic Sedimentologist/Stratigrapher
University of Colorado at Boulder

The Energy and Minerals Applied Research Center at the University of Colorado is seeking candidates for a post-doctoral researcher in clastic sedimentology and stratigraphy. This is a 1-yr. position with the possibility for extension. Theh individual will conduct "reservoir=scale" outcrop-based stratigraphic research on the Mesaverde Group (Colorado and Utah), and on the associated controls on reservoir architecture and heterogeneity. Candidates should send a CV and contact information for three references to: Dr. Matt Pranter, Department of Geological Sciences, University of Colorado, 399 UCB, Boulder, CO 80309-399, or .

Refer to , posting #806748. The University of Colorado is committed to diversity and equality in education and employment; and conducts background checks on all final applicants being considered for employment.

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Visiting Faculty Position
University of Pittsburgh at Bradford

Petroleum Technology: Full-time visiting faculty position beginning August 2009. PhD or MS is preferred, but candidates with a BS and extensive experience in petroleum technology will be considered. Will teach Petroleum Geology and Workshop Practices (in petroleum technology), geophysical Prospecting, and Engineering Geology, together with courses in the candidate's areas of specialty. Send statement of teaching and petroleum-related experience, resume, and names and contact information of three references to Dr. Assad Panah, Director, Petroleum Technology Program, 300 Campus Drive, Bradford, PA 16701-2898. Applications will be accepted until position is filled. AA/EOE.

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DIRECTOR'Scorner

Denver a Great Place for New Ideas

By RICK FRITZ

I heard a comedian say, "Adults are always asking kids what they want to be when they grow up – 'cause they're looking for ideas."

If you are looking for some great ideas then I have just the place for you. It is time for the AAPG Annual Convention and Exhibition (ACE) in Denver, and we are scheduled for a week of great technical talks and professional opportunities.

ACE officially starts this year on June 7 and ends on June 10, but there will be many activities before and after the meeting – especially a number of excellent field trips.

Randy Ray is this year's general chair, and he has a passion for developing the best possible experience for attendees. That passion starts with science and has resulted in an incredible technical program.

The development of the Denver program is led by general technical program chair **Steve Sonnenberg** and technical program vice-chair **Paul Weimer**. The technical themes are broad and include sessions from "Global Deepwater E&P" to "Unconventional Reservoirs" worldwide.

In addition to the technical talks the committee has produced a number of special events. Highlights include:

✓ The opening session (Sunday) – Something new will be added to this year's opening session: entertainment by the award-winning Rocky Mountain Children's Choir, which will provide both pre-show music and a grand finale that could have you dancing all the way to the Icebreaker. Plan now to arrive early to enjoy the show.

Of course, the more traditional trappings of the opening session will be offered as well. AAPG President **Scott Tinker** will give his presidential address and our profession's top scientists and

Fritz

> The overarching importance of attending the meeting is the tremendous opportunity that we all have for networking.

leaders will receive well-deserved awards, including the presentation of the Sidney Powers Memorial Award to **Marlan Downey**.

✓ AAPG's annual Management Forum (Monday), which this year is built on the theme "Challenges for Global Energy Demand – Short-term Variability and Long-Term Solutions."

✓ There will be several other special sessions and forums, including this year's Discovery Thinking Forum (Monday), featuring seven more explorers and geoscientists from the AAPG's 100th Anniversary Committee's list of "100 Who Made a Difference." This year's group includes **Bill Barrett**, **Richard Findley**, **Steve Kneller**, **Doug Strickland**, **Ray Thomasson**, **Bob Weimer** and **Marv Brittenham**.

✓ The Michael T. Halbouty Lecture (Monday) will once again offer a very special guest at the podium: **Guilherme de Oliveira Estrella**, the director of exploration and production of Petrobras, will discuss the oil and gas potential and impact of Brazil's newest plays.

✓ This year's All-Convention Luncheon (Monday) will feature AAPG's own **T. Boone Pickens**, the high-profile entrepreneur, philanthropist and creator of the "Picken's Plan," who will discuss his experience in the oil and gas industry and the economic and political changes that will control our future.

Tickets for this event are selling at a very brisk rate – the event may be completely sold out before the meeting begins – so if this is an event you'd like to experience (and who wouldn't?), here's a suggestion: Buy your tickets now.

The AAPG Divisions also have luncheons on Tuesday and Wednesday with good opportunities for professional development. Slated for those events are:

✓ The DPA luncheon speaker (Tuesday) will be Denver Mayor **John Hickenlooper**, an AAPG member whose geologist-turned brewpub pioneer-turned elected official career has resulted in his being called one of the country's top five "big city" mayors by Time magazine.

✓ The DEG luncheon speaker (Wednesday) will be **Mike Jacobs**, with Pioneer Natural Resources USA, who will discuss the "Cooperative Aquifer Restoration Project, Fort Peck Indian Reservation – A Multi-Agency Success Story."

✓ The EMD luncheon speaker (Wednesday) actually offers an out-of-this-world experience; **Jeffrey Kargel**, adjunct professor and senior research scientist at the University of Arizona, will discuss "Unconventional Far-Out Petroleum and Gas: Hydrocarbons from Mars to Titan and Beyond."

✓ And as always, the latest in technology will be on display in the ACE exhibition hall. New technology is an integral component in the success of new plays, and this will be an excellent opportunity to observe and talk to those who provide the services.

* * *

Another key part of the annual meeting is the opportunity for the various AAPG committees to conduct the business of the Association.

If you are interested in serving on a committee, this is the best time of the year to become active; most committees add new members at the end of the AAPG fiscal year (June 30).

The easiest way to join a committee is to go online at aapg.org, search the committee pages for your area of interest and then contact the committee chairs.

You also can contact me or other AAPG staff members and we can help with the process.

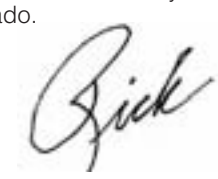
* * *

Although science and technology represent the heart of the ACE experience, the overarching importance of attending the meeting is the tremendous opportunity that we all have for networking.

Networking is extremely important as the industry cycles through the current economic conditions – and there are many opportunities throughout the entire event to greet and meet your peers, including receptions and alumni events.

Of course, Denver and the mountains are always great in June.

Please take the time and opportunity to join us for a little Rocky Mountain High in Colorado.



18 sessions set for Denver

EMD Program Looks to Future

By LAURA L. WRAY
EMD Vice Chair

AAPG'S Energy Minerals Division (EMD) will respond to heightened awareness of global energy issues by offering an extensive and diverse selection of sessions, short courses, field trips and forums at the upcoming 2009 AAPG Annual Convention and Exhibition, set for June 7-10 in Denver.

The core of this year's technical program, "Image the Present, Imagine the Future" coincides with EMD's focus on current and future energy mineral sources and technologies including coal, coalbed methane, CO_2 sequestration, gas hydrates, gas shales, energy economics, geospatial technology, geothermal resources, oil (tar) sands, oil shales, uranium minerals and astrogeology topics.

Eighteen oral and poster sessions, included under eight separate themes, are highlighted below with short course, field trip and forum opportunities.

Wray

EMD Oral and Poster Sessions

❒ Theme II: Hydrocarbon Systems and Basin Analysis

✓ Exploration Application of High Resolution Magnetic, Gravity and Remote Sensing Data in Frontier and Mature Basins.

✓ Petroleum Systems – Source Rocks.

❒ Theme V: Structural Geology

✓ Tectonics and Diagenesis in Shale Basins.

❒ Theme VIII: Tight Gas

✓ Pore Network and Fluid Flow in Mudrocks.

✓ Petrophysics of Shales and Tight Gas Sands: Converting Resources to Reserves.

❒ Theme IX: Unconventional Reservoirs

✓ Gas Shales Reservoirs – Updates and New Insights.

✓ Coalbed Hydrocarbons.

✓ Hydrates – Sedimentology and Resources.

✓ Oil Shales – Reservoir Characterization and Testing.

✓ Oil/Tar Sands – New Techniques and Resource Assessments.

✓ Core Poster Session: Fractured Shale Reservoirs.

❒ Theme X: Astrogeology

✓ Energy Minerals in the Solar System: Resources for the 21st Century.

✓ The Impacts of Impacts.

✓ Lunar Field Exploration Equipment and Sample Documentation.

❒ Theme XI: Alternative and Renewable Energy

✓ Uranium Minerals and Exploration.

✓ Geothermal Energy Systems – Their Structure, Stratigraphy and Rock Mechanics.

❒ Theme XIII: Responsible Development, Sustainability, Climate Science

✓ Carbon Dioxide Capture and Geologic Sequestration.

❒ Theme XV: New Technologies

✓ GIS/Geospatial Map Gallery.

See **EMD**, page 49