



# AAPG EXPLORER

APRIL 2014

Annual Convention  
& Exhibition 2014

## Great Expectations

*AAPG draws an ACE this month in Houston*

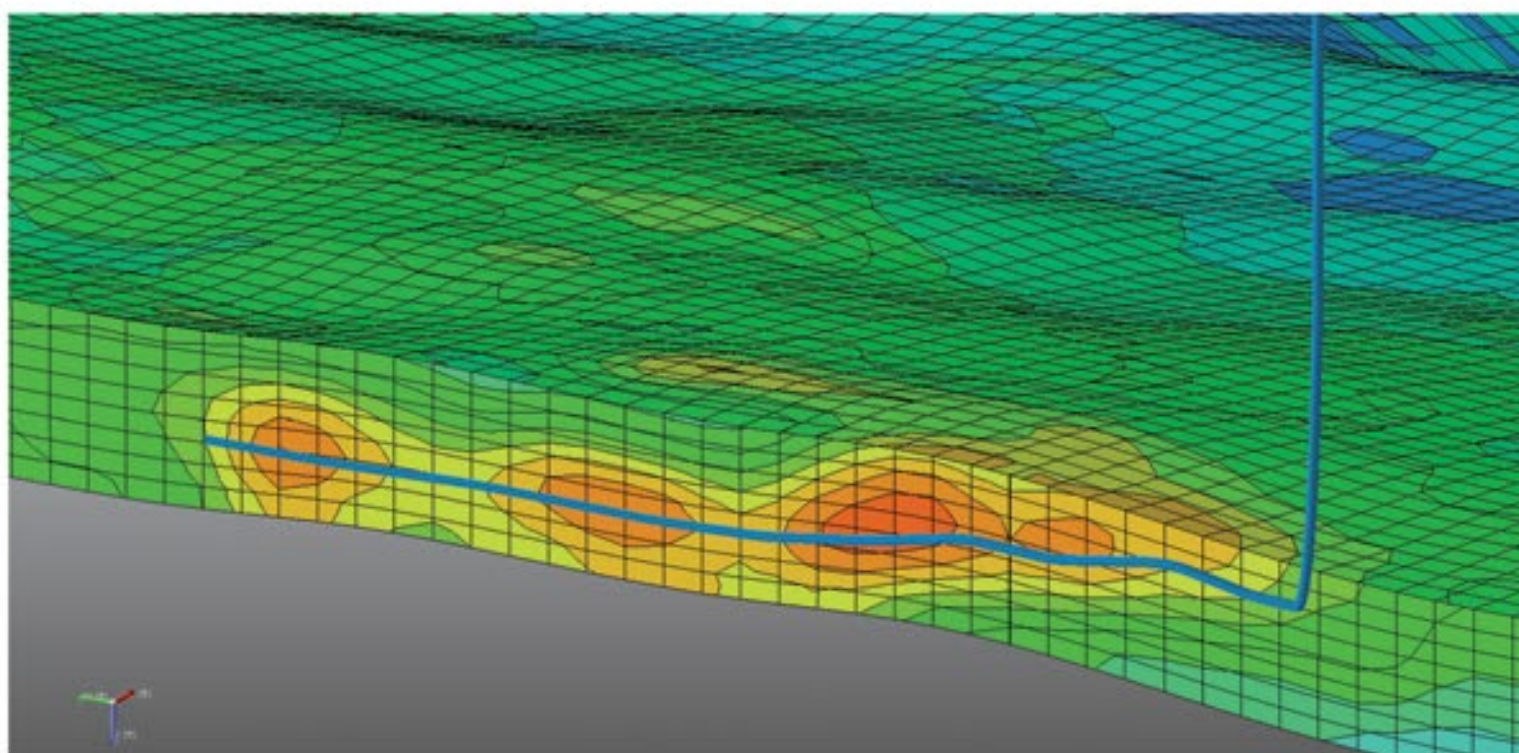
*See page 8*





# Make Every Frac Count

Geoscience solutions for unconventional resources



The benefits of integrated geoscience and drilling technologies include proper positioning of frac zones within targeted reservoirs to maximize production.

Success in the exploration and development of unconventional source rock plays (shale, carbonate gas and oil, tight gas, etc.) depends largely on thorough integration of geoscience and drilling technologies.

The CGG and Baker Hughes Shale Science Alliance has developed a fit-for-purpose integrated solution to successfully explore and develop unconventional resources. Our scientific approach supports efficient well placement and optimized hydraulic fracturing by estimating rock brittleness and stress derived from seismic data that is calibrated with formation evaluation and geological data to provide predictive models for well trajectory planning and completion (frac) modeling analysis and design.

Visit us during AAPG at booth #1543

[cgg.com/shale](http://cgg.com/shale)



Shale  
Science  
Alliance





PRESIDENT'S COLUMN

Doing What We Say We Do: Volunteering? Really?

BY LEE F. KRYSTINIK

This month we're continuing to compare the record at AAPG when it comes to doing what we say we do, and we ask this question: Are we volunteering?

\* \* \*

At AAPG we often say that our volunteers keep the whole organization moving, and that they are a tremendous source for new ideas and new opportunities, and thus the future of AAPG.

Volunteers working diligently on behalf of AAPG, through all the various committees and subcommittees and other assorted groups across the globe number about 484, working on much of the business of the AAPG.

Now, if we add in all the folks who work on making meetings happen in any given year for AAPG, they number about another 200.

And if we now include the House of Delegates, Advisory Council and Executive Committee we can add another 250, for an approximate total of 934.

So, approximately 934 people in all of AAPG are working at any given time as volunteers for the other 39,000-plus of us. Hmm. Let's see ... that would be about 2 percent of the total membership.

Sorry folks, but this is NOT a number I am going to jump up and down and celebrate.

\* \* \*

So, from a governance, business and strategic perspective, what does this low number of active volunteers translate to for AAPG?



KRYSTINIK

Without new people coming in as volunteers the available leadership pool dwindles – along with our ability to flexibly deal with new challenges.

Our pool of future leaders comes from our group of volunteers who rise through the ranks of volunteer activities and show passion, leadership and teamwork skills along the way.

If you become actively involved in AAPG, you can have a surprising degree of impact within AAPG – and it can happen pretty quickly. Just ask Richard Ball, our present secretary on the AAPG Executive Committee, who has not yet

seen the age of 32.

But without new people coming in as volunteers the available leadership pool dwindles – along with our ability to flexibly deal with new challenges.

Our volunteers help shape most of our business activities – this includes the EXPLORER, the BULLETIN, our hard-copy and digital publications, our short courses and our meetings, and essentially everything else AAPG does.

A small number of people working as volunteers may be able to get a job done, but fewer people produce a smaller pool of ideas and fewer new product opportunities. The same people doing the same job over and over again can result in a stagnant business and most of us know what happens to stagnant businesses over time.

We need new faces in the mix. Strategically, if AAPG is to compete successfully in an ever-increasingly more complex and challenging business environment, we need new blood – and not just a few of you!

By the way, our volunteers designed that long-range strategic plan at the center of our three-year business plans.

We need new faces in all experience ranges, and we especially need young

See President, next page

Voting Continues for AAPG Executive Committee

Voting continues for the 2014-15 AAPG Executive Committee, with members having the option of casting a ballot either online or via mail.

Voting will remain open through May 15. Biographical information on all six AAPG officer candidates for the 2014-15 Executive Committee, plus their responses on the topic: "Why I Accepted the Invitation to be a Candidate for an AAPG Office," are available online.

Also available online are videos of all six candidates – featuring a conversational question-answer format – where they will remain throughout the election season.

The videos show candidates

responding to six specific questions, and are intended to allow members around the world to have a better introduction to those running for office.

The person voted president-elect will serve in that capacity for one year and will be AAPG president for 2015-16. The terms for vice president-Sections and treasurer are two years.

To view the videos, go online to [www.aapg.org/business/candidates/](http://www.aapg.org/business/candidates/). The slate is:

President-Elect

Alfredo E. Guzmán, consultant, Veracruz, Mexico.

John R. Hogg, MGM Energy Corp., Calgary, Canada.

Vice President-Sections

Steven H. Brachman, Wapiti Energy, Houston.

Hannes E. Leetaru, Illinois State Geological Survey, Urbana, Ill.

Treasurer

Vlastimila Dvorakova, Czech Geological Survey, Brno, Czech Republic.

James W. Tucker, consultant, Houston.

STAFF

Managing Editor

Vern Stefanic  
email: [vstefan@AAPG.org](mailto:vstefan@AAPG.org)

Assistant Managing Editor

Brian Ervin  
email: [bervin@AAPG.org](mailto:bervin@AAPG.org)

Communications Project Specialist

Susie Moore  
email: [smoore@AAPG.org](mailto:smoore@AAPG.org)

Graphics/Production

Matt Randolph  
email: [mrandolph@AAPG.org](mailto:mrandolph@AAPG.org)

Advertising Coordinator

Steve Praytor  
P.O. Box 979, Tulsa, Okla. 74101  
Phone: (918) 560-2647 – fax: (918) 560-2636  
(U.S. and Canada only: 1-800-288-7636)

(Note: The above number is for advertising purposes only.)  
email: [spraytor@AAPG.org](mailto:spraytor@AAPG.org)

CORRESPONDENTS

David Brown  
Courtney Chadney  
Louise S. Durham  
Barry Friedman

Emily Smith Llinás  
Heather Saucier  
Ken Milam

TABLE of CONTENTS

6 **2014 Salary Survey:** It's a good time to be in the business of rocks, according to AAPG's annual survey of geologist salaries, and it only gets better with age and experience.

8 **ACE technical program:** Due in part to a record number of strong abstracts, this year's technical program is expected to be broad and well-balanced.

14 **Sidney Powers Memorial Award 2014:** Ernest Mancini receives AAPG's highest honor for a career of mentorship and academic rigor.



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

22 **ACE Honors and Awards:** AAPG celebrates a host of movers and shakers for maintaining excellence in the industry and grooming the next generation of geologists.

34 **A Giant Leap for the Energy Industry: Geology-in-Space** promises new frontiers in energy and the economy.

44 **Michel T. Halbouty Outstanding Leadership Award 2014:** Pete Rose is celebrated for a career built on taking chances and analyzing risk.

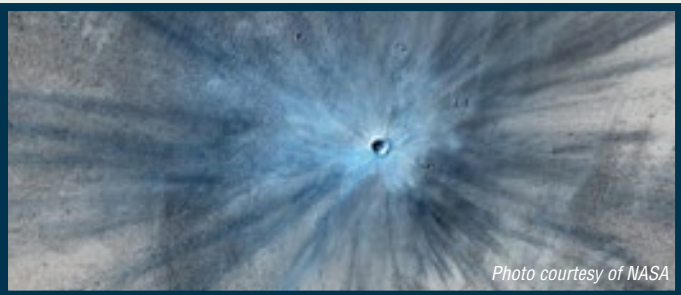


Photo courtesy of NASA

REGULAR DEPARTMENTS

Regions and Sections .....	58
Historical Highlights .....	68
Policy Watch .....	70
Geophysical Corner .....	72
ProTracks .....	74
In Memory .....	75
www.Update .....	77
Foundation Update .....	78
Readers' Forum .....	81
Classified Ads .....	81
Director's Corner .....	82
Divisions Report (DPA) .....	82

ON THE COVER:

West Texas' Lozier Canyon offers an opportunity to examine Eagle Ford Shale outcrops at various scales across a sizable area – and the destination of an field trip being offered in conjunction with the upcoming AAPG Annual Convention and Exhibition in Houston. See story, page 40. Photo by Art Donovan. On this page: This image of a 100-foot crater was taken by the High Resolution Imaging Science Experiment camera on NASA's Mars Reconnaissance Orbiter on Nov. 19, 2013. Ejecta from the impact may contain materials that could be harvested as rocket fuel. See story, page 34.



## President from page 3

new blood to bring new ways of thinking to this grand old organization!

Your volunteer service can have a huge and lasting effect upon AAPG – and your choice to stand on the sidelines and watch is one less bit of energy and insight that might otherwise lead to expanding upon our past successes, or stand between us and being subsumed by a competitor.

\* \* \*

Now, for those of you who already are part of the AAPG volunteer team:

Another component of volunteerism

is for our volunteers to bring others into the fold.

You best know the work and dedication required, the occasional frustrations and politics sometimes involved in any activity where people are part of the mix, but you also know how good it feels to personally cause progress in an organization that brings a lot of good geoscience and professionalism to an industry that provides energy to power the world economy.

Please go out and seek new volunteers and mentor them into the position you hold, so that our future is assured with new, young faces coming to the fore.

Like most things in life, sometimes we have to pay to play. Volunteer for AAPG!

Your personal volunteer effort might

seem little to you, but it really is a big deal in the scheme of all of AAPG.

So, to our AAPG volunteers – my profound thanks to each and every one of you!

And those of you who aren't yet volunteers for this wonderful organization, please feel free to ping me at [lee.krystinik@aapg.org](mailto:lee.krystinik@aapg.org) and let me know how you would like to help AAPG do what we say we will do by volunteering somewhere within this great organization.



## AAPG's Role Is Large at OTC

**A**APG once again will have a strong presence at the annual Offshore Technology Conference (OTC), set May 5-8 at the Reliant Center in Houston.

OTC, sponsored in part by AAPG, is regarded to be the world's premiere event for the development of offshore resources in the areas of exploration, drilling, production and environmental protection.

OTC this year will be celebrating its 45th anniversary.

A large part of OTC's appeal can be found in its enormous exhibits area, where more than 2,600 companies will be represented.

But just as important is OTC's extensive technical program, which offers:

- ▶ Topical breakfasts and luncheons featuring senior executives who will share their views on future industry directions, operational integrity and risk management.

- ▶ Panel discussions led by experts and high-ranking government officials addressing issues related to public policy, energy development and health, safety and the environment.

- ▶ Peer-selected technical presentations on new technologies and case histories.

And as in past years, AAPG will be providing content for much of the technical program, including these AAPG-sponsored events:

### Monday (May 5)

- ▶ 7:30-9 a.m. – Breakfast, featuring Silvia Peppoloni, on "Geoethics: A Way of Thinking and Practicing Geosciences."

- ▶ 9:30-noon – Session on "Monitoring Techniques and Systems, Cradle to Cradle – A Vital Input to Reliability and Integrity Management Programs."

- ▶ 2-4:30 p.m. – Session on "New Geophysical Approaches for Geohazard Consideration."

### Tuesday (May 6)

- ▶ 7:30-9 a.m. – Breakfast, featuring Kelley Elliott, 2020 LLC/Acentia Company contractor to NOAA Office of Ocean Exploration and Research, on "Community-Driven, Telepresence-Enabled Ocean Exploration on NOAA Ship Okeanos Explorer."

- ▶ 9:30-noon – Session on "Marine Archaeology and Environmental Studies in the Offshore Oil and Gas Industry."

- ▶ 2-4:30 p.m. – Session on "Emerging Offshore Geosciences Technologies."

- ▶ 4:45-6:30 p.m. – "Geosciences Day" reception, sponsored by AAPG and SEG.

### Wednesday (May 7)

- ▶ 9:30-noon – Session on "Law of the Sea."

- ▶ 2-4:30 p.m. – Technical sessions:

- ✓ "Petrotechnical Data Donation to Universities – Symposium on Results."

- ✓ "Methane Hydrate Case Studies."

- ✓ "Metocean – New Developments and Perspectives."

### Thursday (May 8)

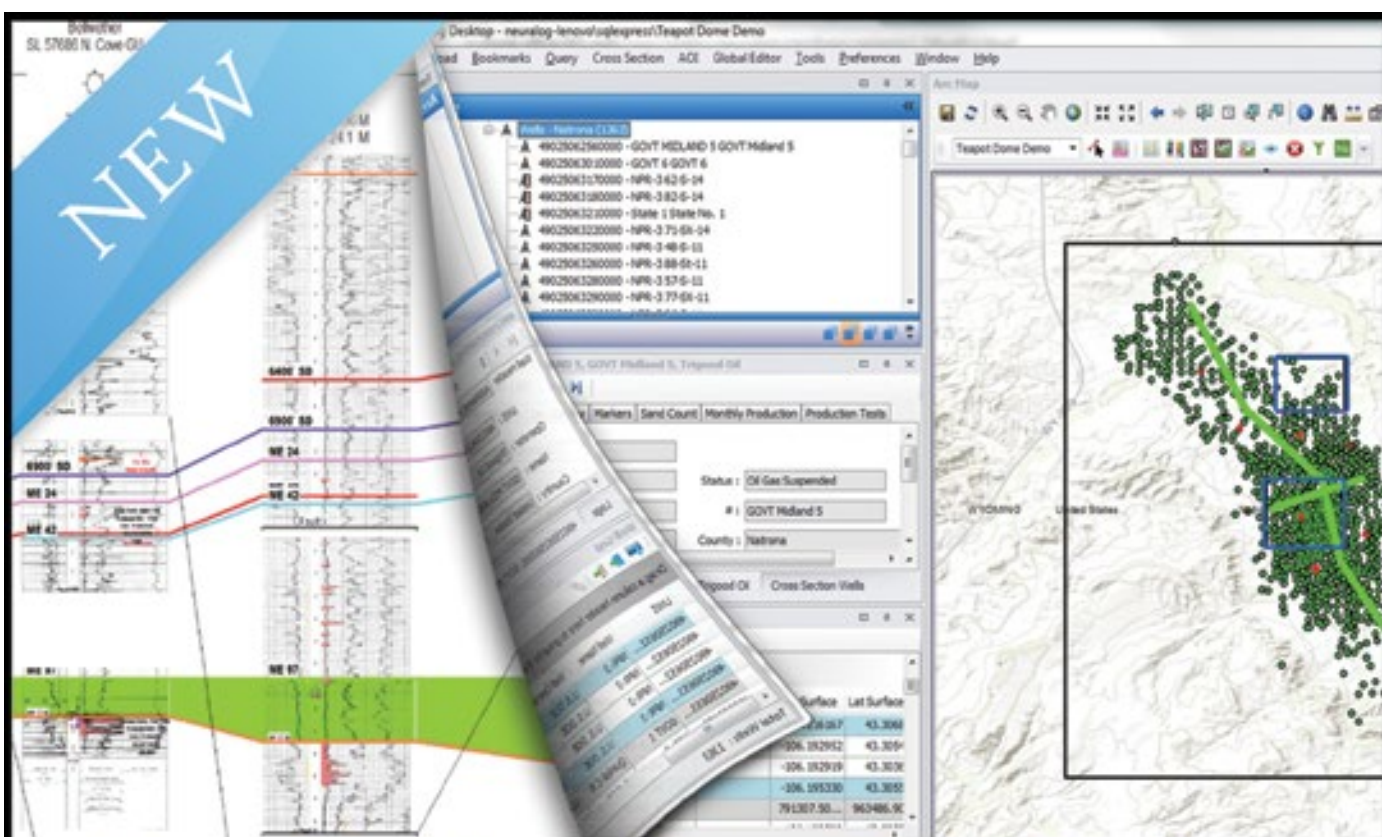
- ▶ 9:30-noon – Technical sessions:

- ✓ "Development in Geotechnical Engineering."

- ✓ "Global Review and Exploration for Methane Hydrates."

- ▶ 2-4:30 p.m. – Technical session on "Underwater Monitoring Network: Strategy and Case Studies."

For more information go to the website at [www.otcnet.org](http://www.otcnet.org).



## Discover New Ways to Uncover Your Evaluation

Neuralog Desktop empowers geoscientists to interactively create, edit, evaluate and display geological data within a single application. Through a powerful GIS-based interface, users are able to quickly access, visualize, evaluate and manage all their data.

- Interactive GIS-based interface
- SQL and Access database support
- ArcMap add-in option
- Simple log, document and project management
- Intuitive map and cross section creation
- Advanced log correlation

Increase the power of  
your ESRI map @  
AAPG Annual  
Booth #1913

**Neuralog**  
Turning Paper Into Petroleum

© 2014 Neuralog · [www.neuralog.com](http://www.neuralog.com) · [sales@neuralog.com](mailto:sales@neuralog.com) · 1.281.240.2525





Petrel

E&P SOFTWARE PLATFORM



## Truly understand your shale development— using integrated analysis

In shale wells 50% of the cost goes into completions. With the Petrel\* E&P software platform, you can unite a wealth of data to characterize heterogeneity and stresses, geosteer to stay in zone, model hydraulic fractures, and engineer completions—to accurately target your fracturing and stimulation.

[software.slb.com/petrel](http://software.slb.com/petrel)

Schlumberger

\*Mark of Schlumberger. © 2014 Schlumberger. 104411521



# Salaries Rise – And Experience Really Pays

By VERN STEFANIC, EXPLORER Managing Editor

Salaries for petroleum geologists showed an overall increase during the past year – in some categories, significantly so – but not all tasted the raise.

This year's annual AAPG salary survey shows a weighted average increase of 8.8 percent in geoscience salaries.

Mike Ayling, of MLA Resources in Tulsa, who has conducted the annual salary survey for AAPG since 1981, quickly pointed out – just like last year's results – that some age and experience groups within the survey did much better than the overall average.

Some groups were dramatically less than the average.

At the top end of increases were the salaries for geologists in the "very experienced" (20-plus years) category, where a 19.5 percent increase was reported.

"People with a lot of experience are highly valued right now," Ayling said.

Ayling also suggested other possible reasons for the apparent salary increase anomaly.

"Perhaps (it is) reflecting the value placed on their ability to contribute during a slack time of industry growth," Ayling said.

Other possibilities: It reflects the industry's "desire to retain experienced staff, and a bit to make up for lower increases in the past.

"They can do the job 'now,' and



AYLING

2013 Geological Salary Survey			
YEARS EXPER	HIGH	AVERAGE	LOW
0-2	\$ 115,000	\$ 103,400	\$ 95,000
3-5	140,000	104,500	101,000
6-9	160,000	145,400	134,000
10-14	207,000	147,600	115,000
15-19	278,000	179,200	144,400
20-24	285,000	219,500	160,100
25+	425,000	252,600	180,000

Average Salary By Degree			
YEARS EXPER	B.S.	M.S.	Ph.D.
0-2	\$ 96,000	\$ 103,800	\$ 115,000
3-5		106,000	140,000
6-9	134,000	144,300	160,000
10-14	130,000	138,300	178,900
15-19	170,000	202,000	149,700
20-24	195,900	222,500	238,000
25+	219,800	275,500	

Historical Averages Salary									
YEARS EXPER	2005	2006	2007	2008	2009	2010	2011	2012	2013
0-2	\$74,400	\$ 82,200	\$ 82,800	\$ 83,600	\$ 87,600	\$ 93,000	\$ 98,700	100,500	\$ 103,400
3-5	81,300	89,600	107,800	108,000	105,600	102,300	109,400	101,000	114,500
6-9	95,400	98,500	121,100	118,400	121,700	127,800	137,300	127,800	145,400
10-14	114,400	111,500	119,800	121,900	123,500	139,100	153,400	147,000	147,500
15-19	119,600	141,000	151,600	139,400	150,800	151,000	193,600	190,300	179,200
20-24	139,000	155,000	167,400	176,800	180,300	191,000	199,200	211,600	219,500
25+	134,100	149,900	162,800	171,700	186,800	206,300	199,600	212,000	252,600

everybody needs the job done 'now,'" Ayling continued. "They don't have to be trained – and companies are not worried about them retiring."

The 0-2 year experience levels showed a small increase – up 3 percent, according to the results – but recently graduated bachelor level geologists had a difficult time finding work.

"And the few that did worked for lower salaries, depressing the overall average," Ayling commented.

"Mid-experienced geoscientists (from 10 to 19 years experience) actually saw little change reflecting considerable salary growth the past years," he noted. "While

these groups remain in strong demand, perhaps lethargic overall hiring has taken a toll on average salaries."

If there was a demographic dynamic that could be discerned from this year's findings, it may be that many older geologists are now moving into management – a possible indication that the anticipated industry "crew change" may be coming closer.

Ayling referenced many indications of pending retirements.

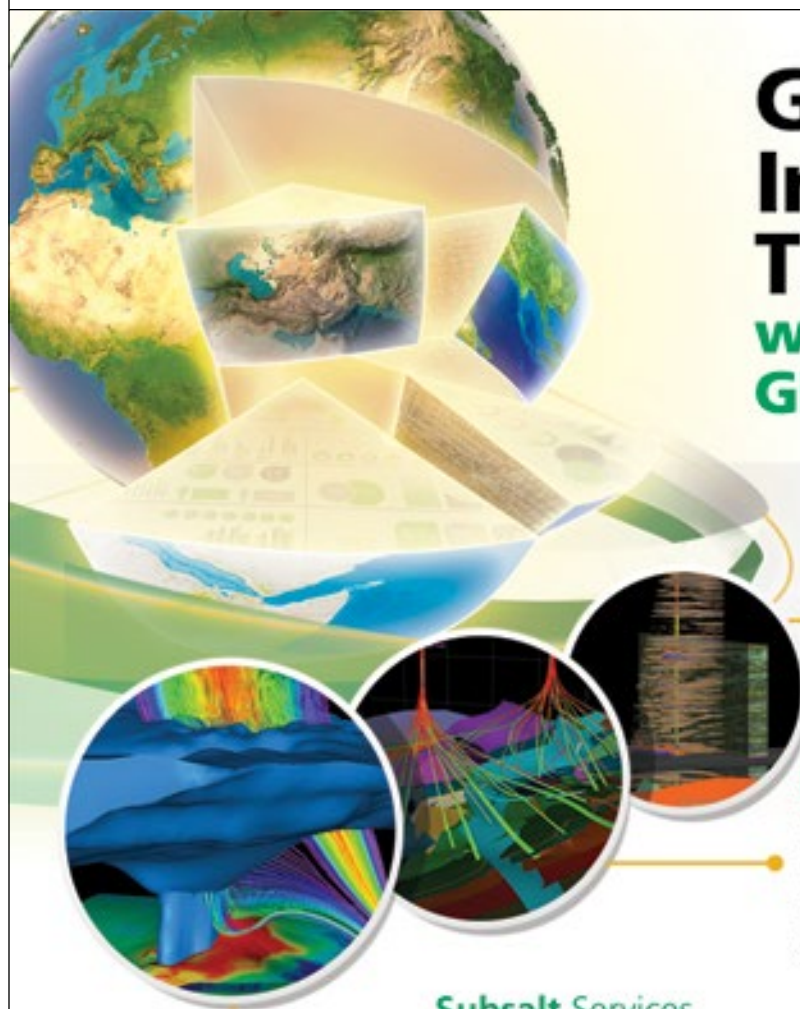
"I don't know where they're (replacements) going to come from," he said. "I suspect people are going to retire and then go to work for someone else on a part-time or consulting basis."

The AAPG annual survey is based on U.S. salaries only, which are still considered the industry's "gold standard." The measurement for international salaries for explorationists is virtually on a country-by-country, case-by-case basis, Ayling said, which makes statistical averaging non-productive beyond the boundaries of any specific country.

Also, many ex-pats are paid U.S.-based salaries, while the national oil companies opt to pay compatriots on a different, lower scale.

Ayling said his survey is based on

**See Salaries, page 10**



## Get Deeper Insights Into The Subsurface with Paradigm GEOSCIENCE SERVICES

**25**  
YEARS OF  
INNOVATION

### Reservoir Characterization Services

Explicit angle migration to reduce the angle estimation uncertainty associated with offset based migrations

Robust suite of AVA(z) and inversion tools

3D visualization tools to validate the correlation between seismic data attributes and well results

### Unconventional Services

Full-azimuth depth imaging and anisotropic velocity analysis for fracture determination

More accurate prediction of pore pressures using proprietary FastVel® algorithms

Elastic inversion to determine brittleness

Geolog® to determine total organic carbon

### Subsalt Services

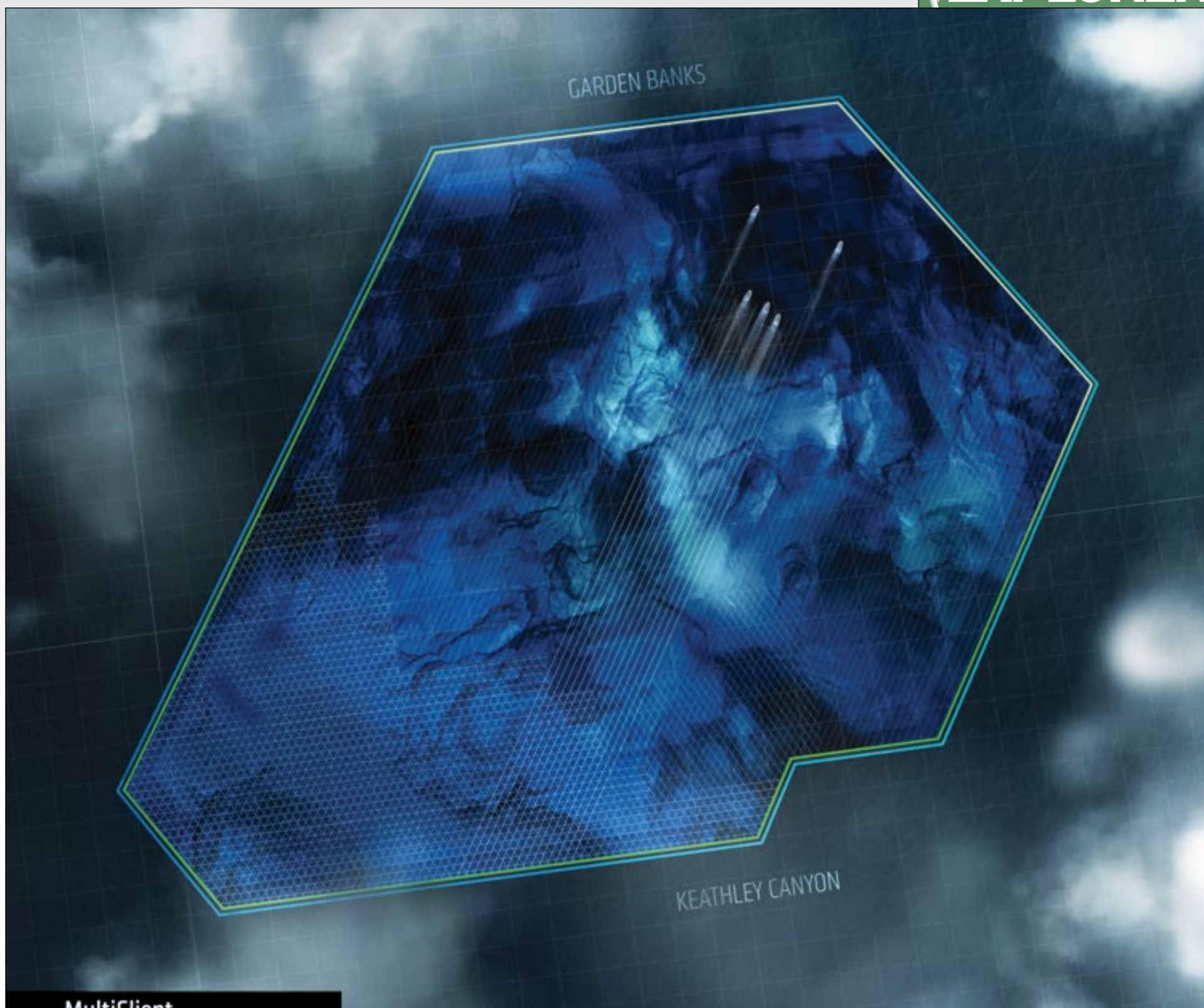
Full azimuth imaging and tomography using EarthStudy 360®, without sectoring

Salt modeling scenario testing without aperture compromise

Broad band two-way imaging

VISIT US AT  
**2014 AAPG**  
BOOTH 1612





## MultiClient

**Triton helps your exploration team:**

- Explore 10,000 sq km of data, covering 390 OCS blocks in Garden Banks and Keathley Canyon
- Identify new prospects and better image previously challenging targets
- Achieve better illumination, deeper penetration, and improved clarity

## TRITON: FULL SPEED AHEAD

PGS reports strong performance of the Triton GeoStreamer® full azimuth survey in the central and western Gulf of Mexico with over 50% of acquisition now complete..

Triton represents the next important advance in tailored acquisition design and state-of-the-art depth imaging, both of which are critical to successful exploration in the deep-water salt-prone Gulf of Mexico. The Triton survey utilizes a total of five vessels in the unique Orion™ configuration to reveal the structures obscured beneath the salt with high fold, long-offset, dual-sensor full azimuth (FAZ) seismic data.

Steven Fishburn, Tel: +1 281 509 8124, [gominfo@pgs.com](mailto:gominfo@pgs.com)

A Clearer Image | [www.pgs.com](http://www.pgs.com)





Record abstract submissions

## 'Balanced' Program Set for Houston

By BRIAN ERVIN, EXPLORER Assistant Managing Editor

Even with an unprecedented number of abstracts submitted this year, organizers of the 2014 AAPG Annual Convention and Exhibition promise a technical program that will favor quality over quantity.

This year's ACE will be held April 6-9 at the George R. Brown Convention Center in Houston, and hosted by the Houston Geological Society and SEPM (Society for Sedimentary Geology).



GILLIS

It's the 13th time AAPG will be traveling to Houston for its annual meeting, making it the most-visited location in Association annals (see accompanying box). ACE was most recently held in Houston in 2011.

"We were fortunate to receive a record number of abstracts, and I think the theme chairs felt like they really had a great number of abstracts from which to build technical sessions," said technical program chair Gretchen Gillis, who is an upstream geological specialist with Aramco Services Company.

Gillis also was AAPG elected editor in 2007-10.

"I think we had about 1,450 abstracts," she added. "It was really good to have so many good abstracts to



Houston's George R. Brown Convention Center is once again the site of the AAPG Annual Convention and Exhibition, which will be held April 6-9.

choose from. Unfortunately, that means we rejected some good abstracts, but we really tried to make the strongest program we could."

The theme for this year's ACE will be "Ideas and Innovation: Fuel for the Energy Capital," and it will feature more than 800 oral and poster presentations and more than 200 exhibitors.

Dave Rensink, general vice chair of ACE 2014, said unconventional will be

a major topic of discussion, but only as a reflection of current industry trends.

"Unconventionals seems to be driving a lot of the exploration these days. It's not going to be dedicated to that subject, but unconventional will have pretty good representation," he said.

"On the whole, I'd say it's a balanced program. I wouldn't say that there's

See ACE 2014, page 10

## AAPG Returns To Houston For 'Lucky 13'

When the AAPG Annual Convention and Exhibition opens on April 6 in Houston, it will be the 13th time the Association has picked Houston for the event.

No other city has served as host as many times.

Houston's first selection as the convention site was in 1924. The general chairman of that meeting was AAPG founding member Alexander Deussen – the first of three conventions he would chair – who also served as the Association's second president in 1919-18.

Deussen eventually would be the second person to receive the Sidney Powers Memorial Award, AAPG's highest honor, in 1947.

Past conventions and the general chairs in Houston were:

- 1924 – Alexander Deussen
- 1933 – Alexander Deussen
- 1941 – Alexander Deussen
- 1953 – Carleton D. Speed Jr.
- 1963 – William A. Thomas
- 1971 – Edd R. Turner Jr.
- 1979 – Anthony Reso
- 1988 – Richard S. Bishop
- 1995 – James O. Lewis Jr.
- 2002 – Jeffrey W. Lund
- 2006 – Charles A. Sternbach
- 2011 – Stephen Levine

MORE THAN MAPPING

VISIT US AT  
AAPG 2014  
April 6-9  
Booth #1219

## WANT TO TRANSCEND THE NORMAL BOUNDARIES OF YOUR WORKFLOW?

Give your productivity a lift with outstanding connectivity and an intuitive interface.

SOFTWARE
SERVICES
CONNECTIVITY
DATA MANAGEMENT

Petrosys software provides freedom to move between data sources effortlessly, access a broad range of data management capabilities and effectively model the subsurface. A clear, logical interface makes it easy to get started and there's dedicated technical support and service when needed. Start achieving exploration and production targets at a lower cost and in a shorter time frame with Petrosys.

Learn more at [www.petrosys.com.au/transcend](http://www.petrosys.com.au/transcend).



# SEE BEYOND THE SHALE

## Basement-to-surface insights point the way to the sweet spots.

The sweet spots are there, but seismic alone can't always find them. Airborne geophysical measurements, combined with existing data, can help you develop insights into the causal factors driving sweet-spot locations, like how variations in the basement or reservoir resistivity impact EUR and well productivity. For existing or potential acreage, you now have the means to make smarter and more profitable decisions.

With NEOS, your reservoir has no limits.



*Above, Below and Beyond*

[neosgeo.com](http://neosgeo.com)



## ACE 2014 from page 8

a heavy emphasis on any particular topic," concurred Gillis. "We've got the technical themes that most people think about when they think of AAPG: clastics, sediments, carbonated sediments, unconventional reservoirs, conventional reservoirs, geophysics, environmental concerns, structural geology, geomechanics, basin modeling and geochemistry."

"We have the standard themes, and I think the beauty of Houston is we have people coming from all over the world who are interested in attending," she added, "and it makes for just a very strong program that will, I think, appeal to people everywhere."



RENSINK

**"It's not going to be dedicated to that subject, but unconventional will have pretty good representation."**

### Changes of Note

Gillis said Houston is a recurring locale for the annual conference because of its centrality in the oil and gas industry, and this year's conference will deliver all of the technical content and professional development AAPG members have come to expect from ACE.

There will, however, be a few minor

changes from previous conferences.

"Because we had such strong submissions for the oral sessions, we decided to have all-day posters instead of half-day posters. That reduces the number of posters that you can accept, but it means that, for people who are trying to manage their time between the oral sessions and the poster sessions, it's a little bit easier to have the option

of seeing the posters all day," Gillis explained.

"We have eight concurrent sessions, which is not unusual," she continued. "We have a relatively low number of forums – we have a forum on Monday morning and one on Tuesday morning. We wanted to limit those sessions because we wanted to make sure that the scientific abstracts were the most important part of the program."

"We also have a 'History of Petroleum Geology' on Sunday," she said, "and one of the things that is unusual is we have an entire day devoted to 'Discovery Thinking.' In previous years we only had a half-day."

"My expectation is that we will have a really great program," Gillis said, "because we have a very large and dedicated committee here in Houston."



## Attending ACE? Don't Miss This

If you will be attending this year's AAPG Annual Convention and Exhibition, make plans now to visit the AAPG Bookstore and the General Store.

Both of those areas will be found in the AAPG Center on the exhibits hall floor.

Why stop by the General Store?

The AAPG Bookstore/General Store site is filled with AAPG apparel that is stylish and functional – newly designed dress shirts, golf shirts, t-shirts, hats and a wide variety of merchandise for children will be available – available exclusively at AAPG ACE meetings.

But the best part is this: By purchasing AAPG apparel and gifts at the General Store you are supporting the Student Chapters whose members volunteer to work in the store during the convention.

Proceeds from the sale of these items go directly back to the Student Chapters that provide the volunteers.

Ten percent of the proceeds also are donated to the AAPG Foundation, in recognition of its ongoing support of students and the Student Chapter Programs within AAPG.

AAPG subsidizes much of the operational costs involved in the General Store, a program that has been offered for over 30 years, benefiting countless chapters and students.

Please come by – and buy. We'll be glad to help you find the right souvenir for yourself, family and co-workers.



## Making Unconventional, Conventional



### PetroFecta® from Fluid Inclusion Technologies

is a unique approach combining XRF (PDQ-XRF®), Trapped Fluid Analysis (FIS®), and High Resolution Photography (RockEye®) of the entire wellbore from well cuttings or core samples of any age.

All analyses are conducted on the same 1 gram sample (up to 575 samples per well) with an analytical cycle of four days.

Data provided on a DVD with previewer software.



**Innovations in Petroleum Risk Management**

Information about PetroFecta® and other FIT services, call 918.461.8984 or visit [www.fittulsa.com](http://www.fittulsa.com)

## Salaries from page 6

employed, salaried geoscientists and cannot account for the large number of unemployed or underemployed individuals. Nor can these numbers take into account the compensation of individuals who are primarily paid in the form of consulting fees, retainers or overrides.

No attempt has been made to include any additional sums to account for employee benefits, bonuses, automobiles or other perquisites. The purpose of this survey is merely to provide a yardstick for those interested in accessing their compensation.

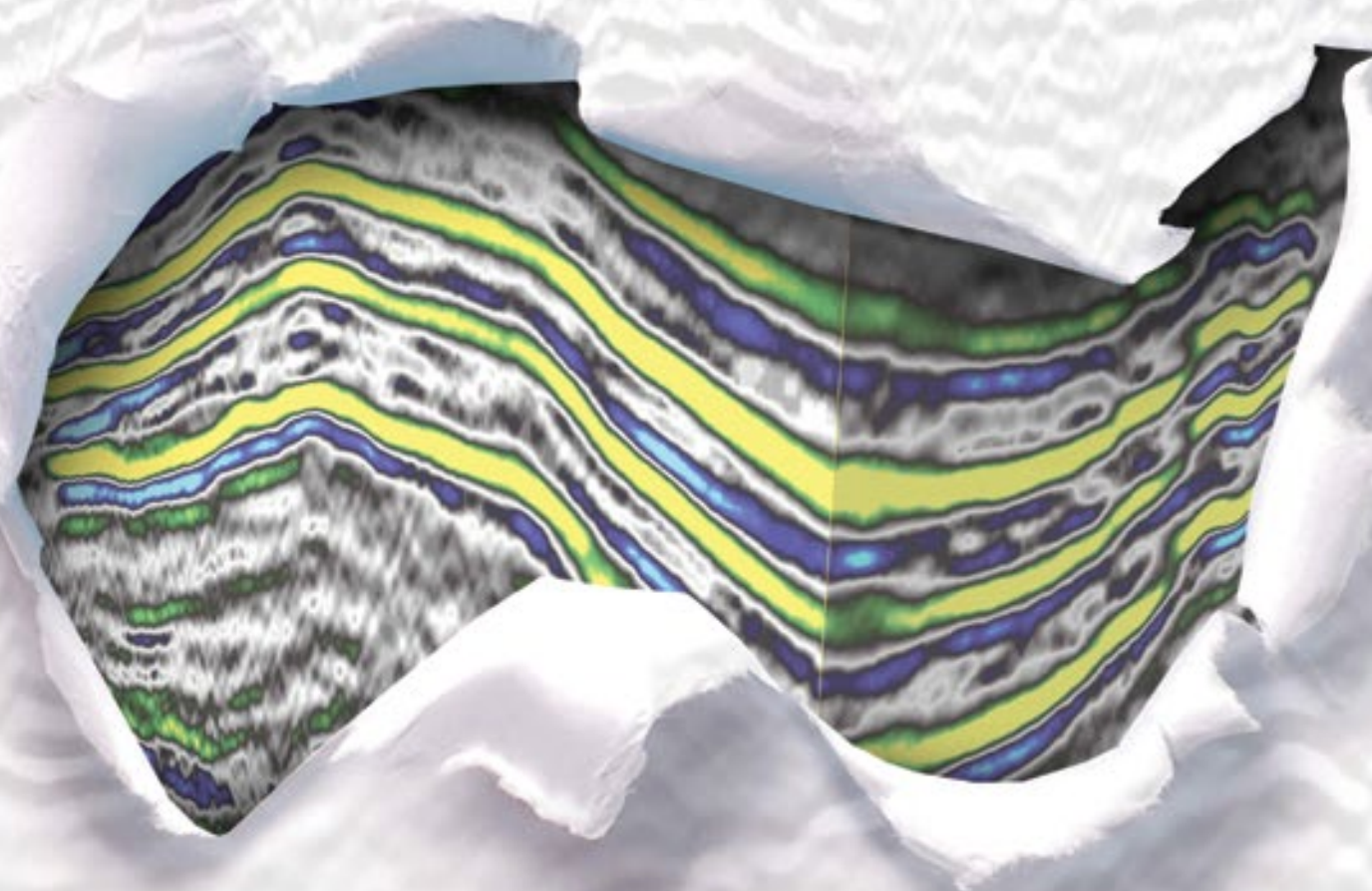
Ayling feels strongly that "compensation is often a secondary consideration when evaluating overall job satisfaction."





# discover more

visit us at the  
**AAPG**  
Annual Convention  
booth #545  
and AAPG International Pavillion #748



...with Spectrum's  
Multi-Client seismic

find out how, Spectrum booth #545  
and supporting Croatia in the International Pavillion



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



# Oil Capital Birthed From Dreams and Disasters

BY DAVID BROWN, EXPLORER Correspondent

**H**ouston grew into the energy capital of the United States, and possibly the world, through more than a century of growth.

But its fate as an energy center was seeded in the space of just 125 days, in a story of disaster followed by discovery.

Two New York brothers, Augustus Chapman Allen and John Kirby Allen, moved to the Texas region in 1832. When independence-minded "Texians" revolted against Mexico, the pair outfitted a ship to help move supplies and protect the coast.

After questions about their operations and rumors of privateering began to circulate, they sold the ship to the Texas Navy – doubling the size of its fleet. Two more schooners were soon added, but by the end of 1837 all of the ships had been lost at sea.

Meanwhile, Augustus and John acquired land by Buffalo Bayou in August 1836, planning to start a new city. They used money from an inheritance granted to Augustus's wife, Charlotte, who suggested naming the city after Texian general and hero Sam Houston.

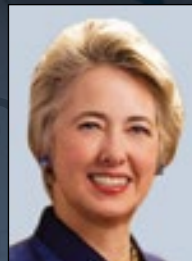
Present-day Houston Mayor Annise Parker noted that the Allens paid \$1.40 per acre for 6,642 acres of land along the banks of the bayou.

"It was mosquito-infested land that just about anyone else would have passed up," Parker said. "Who would have thought at the time that this real estate speculation would have grown into the international city we are today?"

"John and Augustus Allen had a dream



*Locations in Houston of the top employers of AAPG members.*



PARKER

and they made it happen," she continued. "We are still a city of entrepreneurs. We say that if you can dream it, you can achieve it here."

John became the representative of Nacogdoches County to the first Congress of the Republic of Texas. He joined a successful lobbying movement to have

Houston named the republic's capital.

The new city got a big boost, but it didn't last long. In 1839 the capital moved to a Colorado River townsite called Waterloo, which soon changed its name to Austin.

Sadly, John Kirby Allen didn't last long, either. He died in August 1838.

## The Game Changer

Houston grew into a major commercial, shipping and railroad hub for the export of cotton, thanks in part to the landings on Buffalo Bayou. By 1890 it had become the railroad center of Texas. Galveston and Houston were the state's main export points, with Galveston having the natural harbor.

Then, on Sept. 8, 1900, the deadliest hurricane in U.S. history hit Galveston. Most of the island was leveled, and somewhere between 6,000 to 8,000 people died.

Economic recovery for Galveston happened slowly, and Houston emerged as the preeminent export hub for the state, with loading points at several places along the bayou.

At the same time, something was happening east of Houston that would prove just as important for Houston's future.

Anthony F. Lucas, an expert on salt dome formations, had begun drilling a wildcat well on a dome called Spindletop, near Beaumont. He made it to 575 feet before running out of money.

[See Houston, page 14](#)



**Earth Sciences**

**AAPG** Annual Convention & Exhibition 2014  
6-9 April, Houston, Texas  
Visit us at booth # 1853



**OpendTect**

**Free**  
seismic interpretation software

**Open Source**  
development environment

**Commercial plugins**  
game-changing functionalities



GeoConvention 2014  
**FOCUS**  
12-16 May, Calgary, Canada  
Visit us at booth # 719

[www.opendtect.org](http://www.opendtect.org)



DECISIONSPACE®

# Cycle time in less time.

You need to build maps in minutes, not weeks, and revise them instantly when new well data improves your understanding of the reservoir. Speed up your cycle time with dynamic updates in DecisionSpace® Geology software, and start seeing real return in the field, in less time.

Visit [www.landmarksoftware.com](http://www.landmarksoftware.com)

High Science Simplified®

**HALLIBURTON**

Landmark Software  
& Services



## AAPG Demographics-HGS Affiliation (as of March 11, 2014)

Total Members affiliated with HGS:	6,962	16.6%	Percentage of Total AAPG Membership
Total records removed*	1,142	16.4%	Percentage of HGS Membership
Total records affiliated as working	5,820	83.6%	Percentage of HGS Membership

### Top 12 Employers

ExxonMobil	491	8.4%	Percentage of HGS (employed) Membership
Chevron	407	7.0%	
BP	323	5.5%	
Shell	291	5.0%	
ConocoPhillips	263	4.5%	
Anadarko	149	2.6%	
Marathon	125	2.1%	
Hess	117	2.0%	
BHP	117	2.0%	
OXY	109	1.9%	
Apache	80	1.4%	
Noble	79	1.4%	
Totals	2,551	43.8%	Percentage of HGS (employed) Membership

\*Removed records include those individuals coded as Students, retired and unknown employment status. All totals inclusive of paid and not paid members.

## Houston from page 12

Lucas was forced to secure funds from private investors and lost much of his financial interest in the lease, but was able to resume drilling.

On Jan. 10, 1901, the well reached 1,139 feet and the wildcat came in. In a huge way. The Lucas Gusher spewed oil 150 feet in the air and produced 100,000 barrels a day.

In a period of little more than four months, Houston was on its way to becoming an energy center for America and the world.

Events that followed strengthened the city's position. In January 1910, Harris County voted to spend \$1.25 million on dredging the Houston ship channel to a

depth of 25 feet, an amount matched by federal funds.

The steamship Satilla, the first deepwater ship to arrive at the Port of Houston, established steamboat service between New York and Houston in June 1914. President Woodrow Wilson officially opened the deepened Ship Channel and enlarged port in November the same year.

Today, according to the city, the Port of Houston ranks first in the United States in international water-borne tonnage handled and second in total cargo tonnage handled. It is the tenth largest port in the world.

### A Diverse, International City

Parker said the city's success largely came from the early-day economic drive and "that entrepreneurial spirit that has continued since the Allen Brothers – it's our can-do attitude and international diversity.

"There are businesses in Houston that do business around the world. Every language of the world is spoken here. We are comfortable with, tolerant and accepting of that which is different," she noted. "This is what gives us an edge in expanding international ties."

In fact, more than 90 languages are spoken throughout the Houston area and 92 countries have consular offices in Houston, the third highest number among U.S. cities.

Oil refineries began appearing along the Houston Ship Channel during the 1920s and 1930s, followed by large petrochemical complexes. The city's oil, petrochemical and shipbuilding industries grew in prominence during World War II.

As international air travel developed, Houston became known as a convenient place to fly from to the west, east and south. By 2010, the city's three-airport system served 49.5 million passengers per year, including more than seven million international travelers.

Home to more than 5,000 energy-related firms, Houston is considered by many to be the Energy Capital of the World. But it has a broad industrial base and contains the headquarters of 23 Fortune 500 companies, second only to New York City.

"In the past, we were known strictly as the oil and gas capital of the world. Today, oil and gas still reign, but Houston is also gaining a worldwide reputation in the 'green' arena," Parker said.

"In fact, a lot of the research into sustainable options is being done by Houston-based energy firms who made their names in oil and gas. This is due to the wealth of knowledge we have available to work on development of the technologies that will fuel our lifestyles in the decades to come," she explained.

By 1850, early-day Houston had exploded into a city with 2,396 residents. Now it has well over 2.1 million, making it the fourth most populous city in the United States.

Houston's Consolidated Metropolitan Statistical Area consists of eight counties – Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller – and covers 8,778 square miles, an area slightly larger than New Jersey. The metropolitan area's population is almost six million.

"We will always be the home of the energy giants, NASA and the Texas Medical Center," Parker said, "but the economic diversification we've experienced since the 1980s oil bust has led to expansion opportunities for a whole host of other industries." ■

## WELLSITE GEOSCIENCE SERVICES



## When time is money, Wellsite Geoscience is money well spent.

Whether you're exploring a basin, producing a well or completing a shale play, time is money. That's why Weatherford Laboratories brings a suite of formation evaluation technologies right to the wellsite. Utilizing mud gas and cuttings, these technologies provide detailed data on gas composition, organic richness, mineralogy and chemostratigraphy in near real time. As a result, operators now have an invaluable tool to assist with sweet spot identification, wellbore positioning, completion design and hydraulic fracturing. We call it Science At the Wellsite. You'll call it money well spent.

### SCIENCE AT THE WELLSITE™

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

Formation Evaluation | Well Construction | Completion | Production

©2013 Weatherford. All rights reserved.





# UNITE

WIRELESS WITHOUT COMPROMISE



No need to choose between simplicity and capability. Whether your project calls for field QC and harvesting or not, UNITE provides the most cost effective solution.

## // HIGH CAPABILITY

RAU eX for greater autonomy & even faster harvesting

## // HIGHER FLEXIBILITY

Buried or on the surface  
1-C or 3-C version  
Compatible with new 508<sup>XT</sup>

## // QUALITY CONTROL BUILT-IN

Remote QC & data harvesting whenever you need it



Nantes, France  
sales.nantes@sercel.com

Houston, USA  
sales.houston@sercel.com

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

ANYWHERE. ANYTIME. EVERYTIME.



Ahead of the Curve<sup>SM</sup>



## Sidney Powers Memorial Award 2014

# Mancini Honored as Mentor, Researcher

By HEATHER SAUCIER, EXPLORER Correspondent

After two years at his first job preparing for an offshore federal lease sale in a frontier basin off Alaska, geologist Ernest A. Mancini was praised by his general manager and assured that if he kept up the good work, it wouldn't be long before he'd have a corner office and a managerial position.

"I went home and said, 'I need to look for another job.' I knew that wasn't going to work," said Mancini, who enjoyed working for the company but wanted a career as a geologist.

Not too long after, Mancini and his wife, Marilyn, and their two daughters found themselves traveling to the United States' Deep South, where Mancini accepted an assistant professor position at the University of Alabama in Tuscaloosa.

Following a gut feeling that teaching was his true calling, Mancini's first step into the classroom – which shared a space with a museum for rocks, minerals and fossils – launched a remarkable career that reached beyond university boundaries, but was always centered around his students.

Mancini is a renowned educator and leading researcher in stratigraphy and petroleum geology of the Gulf of Mexico region, both onshore and offshore. Over the course of 40 years, he has held many prestigious positions, including:

- ▶ Director of the Center for Sedimentary Basin Studies at the University of Alabama.
- ▶ Director of the Berg-Hughes Center for Petroleum and Sedimentary Systems at



A wonderful life: Through the years with Sidney Powers Award winner Ernie Mancini.

Texas A&M University.

▶ Director of the State Oil and Gas Board of Alabama.

▶ State geologist and director of the Geological Survey of Alabama.

Today, at age 67, he is a professor emeritus and retired distinguished research professor at the University of Alabama, where he continues to teach graduate students on a part-time basis.

In recognition of his contributions to the field of petroleum geology, the AAPG has awarded Mancini its highest honor: the Sidney Powers Memorial Award. Mancini is

the 67th recipient of the award named after one of the Association's founding members known for his work in pure and applied geology and for his service to others.

Mancini received more than 50 letters of support for the award by AAPG members.

"Ernie has fundamentally advanced our understanding of the geology of the Gulf of Mexico region. His work has been fundamental and a significant contribution to the knowledge of this area," said AAPG member Nick Tew, state geologist of Alabama/oil and gas supervisor.

"He was my master's thesis director and

we conducted a lot of research together over the years," Tew said. "He has been my mentor, colleague and friend for over 30 years, and I've learned a lot from him."

### Applied Science

Mancini no doubt follows in Powers' footsteps. Professionally, he went against the traditional academic grain by establishing integrative research and teaching centers that combine fundamental and applied geology as well as geophysics and petroleum engineering under one umbrella.

"Let's not do science for science's sake," he tells students. "We need to have some applications."

In that vein, geology students at the University of Alabama and at Texas A&M University now have teachers from both the geosciences and petroleum engineering departments and write their master's theses on geosciences combined with reservoir simulation or other petroleum engineering subjects. Going a step beyond solving problems on paper, they test their research with field studies.

"They need to be able to think critically and figure out why a hole was dry," Mancini said. "Not that it was a dry hole and then move on."

Mancini's career also took him into public service where he helped the state

See Mancini, page 18

## MultiClient Geophysical

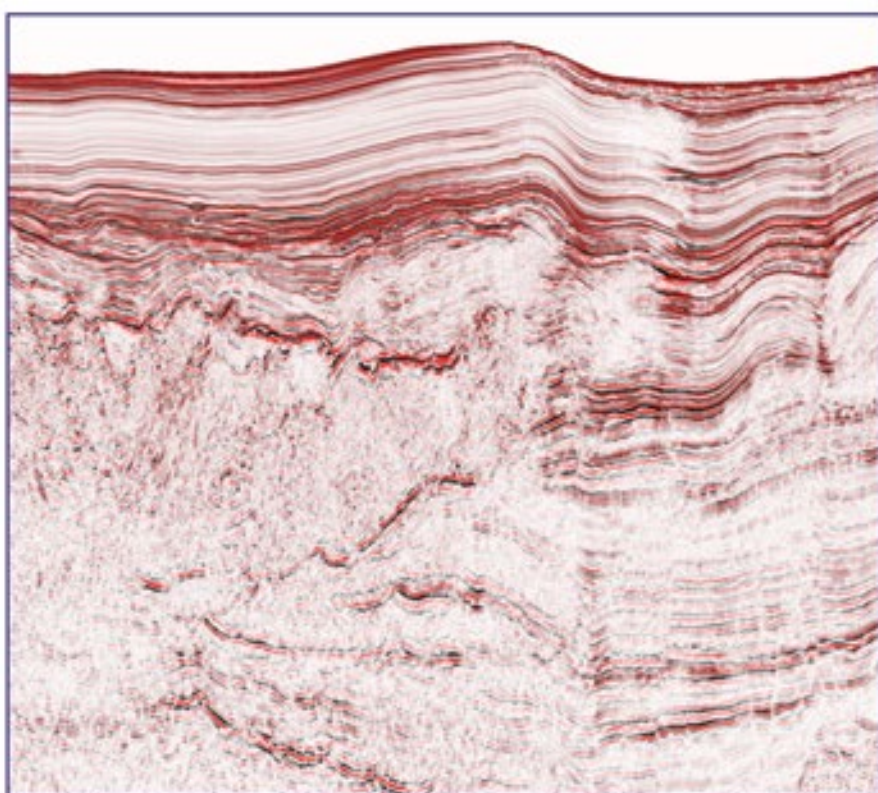


### Offshore Barbados

MCG has available 6,837 km of

- New Seismic
- Gravity and Magnetic Data

The data covers all 26 blocks open for bidding.



For further information please contact:

Kenneth Mohn  
+1 713 485-9696

Tom Wolden  
+47 66 98 41 18

John Whitcomb  
+65 63 27 97 44

Visit us at booth 755 at AAPG 2014

[www.mcg.no](http://www.mcg.no)





## Transition Zone & OBS Ocean Bottom Cable and Nodal Surveys

Geokinetics' OBS group operates ocean bottom cable and nodal surveys across a diverse range of unique marine environments. Although the challenges and solutions may vary, there are common threads woven through each successful project.

Meticulous pre-project planning, together with state of the art research and maintenance facilities, ensure timely project starts and adherence to schedules.

Geokinetics' Geophysical Design and Processing Groups expertly balance the competing demands of complex seismic surveys and project economics. Most recently their ingenuity has become a pre-requisite in enabling commercially viable full wide azimuth surveys requiring ultra-long offsets, such as those that prevail in the deep basins of the US Gulf and West Africa.

Customized vessels and handling systems afford our crews safe and effective operational tools in the specified environs. From the largest blue water fleet to the smaller TZ craft, we apply the same rigorous standards of efficiency, productivity and reliability.

Regardless of whether a project is located in the transitional zone reef and surf environment or is an offshore 4C wide azimuth survey in a congested oil field, Geokinetics will deliver the optimum solution. That end result is superior, timely, cost effective seismic data delivery.

**Get on board with Geokinetics.**





## Mancini from page 16

of Alabama jumpstart its gas production initiative in coastal waters as well as launch the state's successful coalbed methane extraction industry using what he calls "reasonable regulations."

However, his devotion to his students is the legacy of which he is most proud.

"Of all the things I've done," Mancini said, "the teaching is most rewarding."

### Pay It Forward

From his first day as a professor, Mancini assumed the mission of imparting every ounce of knowledge he learned from the industry. He typically tossed textbooks aside and passed out his own papers for students to scrutinize.

"You would have all failed," he exclaimed when the aspiring geologists naturally praised their professor's work. "There are flaws in it."

Unlike some professors who don't allow their students to contradict their past work, Mancini invited students to think for themselves and to ask questions.

"It might not be right," he warned of taking someone else's work at face value. "And the next day you might drill a well and it's dry."

Not one to seek the spotlight, Mancini often has stayed in the wings to allow his students to grow professionally. If he revises papers, he always considers the student to be the first author and receive credit.

When he receives invitations to present on certain topics, when feasible, he puts his students front and center.

"That's what's going to help them professionally," he said. "What does it do for me? It's just another one that you put

on a list. I'm a teacher. That's what you're supposed to do."

His efforts have been paid forward in droves.

Former master's student Sharbel Al Haddad, an AAPG member who works as a geologist for ExxonMobil in Houston, views Mancini as much more than a teacher.

"He was like a grandfather or father for me. I can still hear his words now, when he gave me advice. In class, he was just amazing. He would leave anything he was doing to help me," Al Haddad recalled.

"I wish that one day I will be able to be even partially as good as he is in geology and personality."

### What's the Problem?

Last year, Mancini was invited to return to his Pennsylvania alma mater, Schuylkill Valley High School, to share with students

his experiences as a member of the first class of inductees into the school's hall of fame.

"I'll teach some classes for you," he offered, and hopped right into discussions on the geochemistry of oil, the controversial aspects of hydraulic fracturing and careers in geology.

Mancini himself started out as a pre-med major – until he had to dissect animals.

"I imagined that being a person and thought there was no way I could do that," he said.

While Mancini invested the time to earn a doctorate degree in geology, students today tend to jump into the workforce earlier, he noted.

"I try really hard with the master's students and their theses to make sure they get practice in critical thinking if they don't want to get that Ph.D.," he said. "Many professors will crank out 'cookie cutter' theses, give a set of data and make the students go through steps one through five and then they graduate.

"I won't give them a thesis problem," he said. "They have to determine the problem."

Over the course of his career, Mancini has shepherded 24 master's students and eight doctorate students through their prospective programs.

"I try to pass on the good and the bad. I use the research to make me a better teacher," he said. "I really enjoyed working with the Ph.D. students. I know where they all are."

### Credit Where Credit Is Due

Speaking frankly about all topics is yet another trait that has made Mancini a valuable resource for so many.

Although he is technically retired and divides his time between Northport, Ala. and Condon, Mont., he remains up to speed on industry issues. He has paid particularly close attention to the country's shale gas boom, which has leapt onto many pages of mainstream newspapers – sometimes in not so flattering ways.

He recalled a time in the early 1980s when the state of Alabama received complaints during the boom of coalbed methane exploration and development.

"Everything was rocking and rolling and then all of a sudden people, landowners, started getting nervous and writing the newspaper saying their water wells went dry," Mancini recalled.

However, a careful investigation by the Alabama Geological Survey could find no correlation.

Mancini said he doesn't believe that fracturing shale is harmful – however, he does wonder whether or not some of the some chemicals used in the process might react with existing rocks beneath the earth's surface.

"I don't know the answer to that, and nobody seems to be asking that question," he said.

Upon learning about the Powers award, Mancini said he felt very humbled.

"It's an extremely high honor, and to me what makes it a particularly high honor is being in the group of individuals who have received this award," Mancini said.

"To be in association with this esteemed group is quite overwhelming," he said. "It's unbelievable."

Of course, Mancini is not one to take all the credit. He quickly attributes his recognition to many people.

"It's not just you – you have students you have worked with, and colleagues. The work is not a single person's endeavor," he said. "It's a recognition of many, many people."

"If you lose sight of that, I think you have a problem." ■



getech



## Leaders in the world of natural resource location

### Globe

Getech's flagship global new ventures platform.

### Regional Reports

Focussed assessments of exploration risks and opportunities.

#### New for 2014

- Tectonic Evolution of the Equatorial Atlantic.
- Tectonic Evolution of the South Atlantic.

### Commissions

Bespoke projects utilising clients' proprietary data.

### Data

Unrivalled global gravity and magnetic coverage.



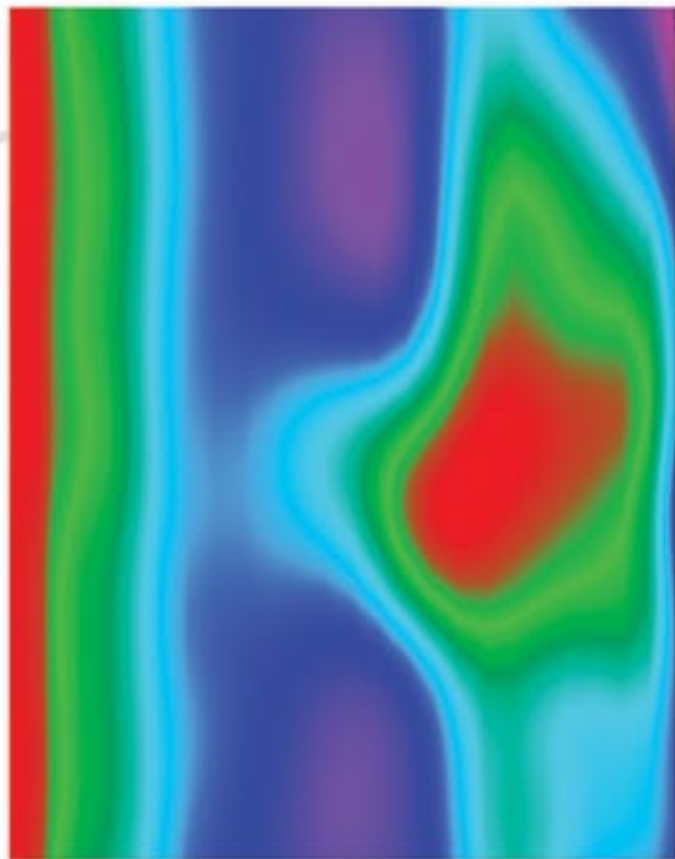
For further information contact Getech:

Getech, Leeds, UK +44 113 322 2200 info@getech.com  
Getech, Houston, US +1 713 979 9900 www.getech.com

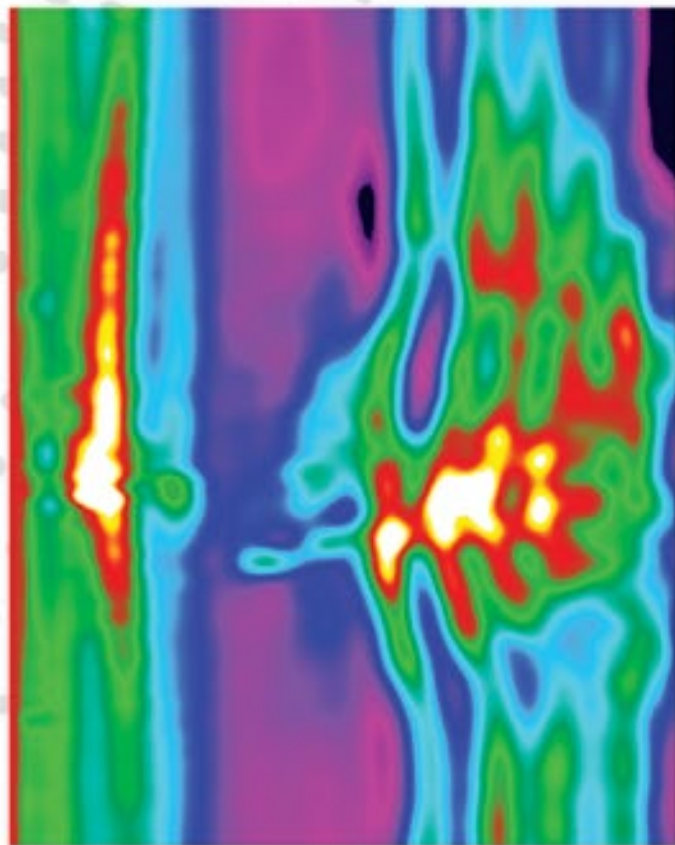
Visit Getech's booth #1049  
at AAPG Houston 2014



# Delivering innovative technologies for complex geologies.



Velocity model before FWI\*



Velocity model after FWI.\*

\*Data courtesy of BP, BP Norge AS and Hess Norge AS

Since introducing the industry-leading RTM and 3D SRME solutions, ION's GX Technology (GXT) group has continued its pioneering research efforts to develop innovative, advanced imaging technologies. Leveraging techniques ranging from extending low frequencies with WiBand™ broadband processing, to generalized move out (GMO) picking for tomography, as well as advanced full waveform inversion (FWI), GXT offers fit-for-purpose, ray- or wave-based, fine-scale velocity modeling. Your result? Superior high resolution images for complex geologies to improve exploration and production success. To learn more, visit [iongeo.com/imagingleaders](http://iongeo.com/imagingleaders).



GX TECHNOLOGY

AREAS OF EXPERTISE  
Unconventional Reservoirs  
Challenging Environments  
→ **Complex Geologies**  
Basin Exploration  
Reservoir Exploitation



# West Africa

## Multi-Client 3D Data



For more information and data viewings contact;

Tony Pedley  
[tony.pedley@polarcus.com](mailto:tony.pedley@polarcus.com)  
 +44 788 44 81747

[www.polarcus.com/mc](http://www.polarcus.com/mc)





**Polarcus** has available for licensing over 14,300 sq. km of multi-client 3D seismic data over a number of prospective areas of the West African Transform Margin between Guinea-Bissau and Nigeria. World class discoveries in the region have generated an unprecedented amount of interest in these areas and open blocks and farm-in opportunities are increasingly sought after. Until now, these areas have lacked the modern 3D data required to properly understand the geology both on a regional and on a prospect scale. The Polarcus data provides significantly improved imaging of both the Carbonate shelf play and the deeper water sandstone plays.

#### AGC Profond

In conjunction with GeoPartners Limited, Polarcus has 1,025 sq. km of data over the central part of the Casamance-Bissau basin.

#### Guinea-Bissau

In conjunction with Petroguin and GeoPartners Limited, Polarcus has 2,380 sq. km of high density data over Block 7B at the confluence of the Southern Mauritania-Senegal-Guinea Bissau basin and the West Africa Transform Margin trend.

#### Nigeria Deepwater

Polarcus Nigeria Limited, a joint venture between Polarcus and Ashbert Limited, has exclusive rights from the Department of Petroleum Resources of Nigeria to broker an extensive modern 3D seismic database of over 11,000 sq. km, covering large tracts of the most prospective open areas available.







MANCINI



ROSE



ARMENTROUT



BÉRCZI



CLARKE



HEWITT



MCGHAY



SKINNER



BOHACS



LOUCKS



AL-OTAIBI



ANDERSON



BOSWORTH



BURRI



CANICH



COOK

## AAPG's Top Awards to be Presented at ACE

By SUSIE MOORE, Communications Project Specialist

**E**rnest A. Mancini, internationally renowned educator and a leading researcher in stratigraphy and petroleum geology of the Gulf of Mexico, both onshore and offshore, will receive the 2014 Sidney Powers Memorial Award, AAPG's highest honor, during the opening session of the AAPG Annual Convention and Exhibition in Houston.

Mancini, an Honorary AAPG member and past elected editor for the Association, is a distinguished research professor of petroleum geology and stratigraphy at the University of Alabama, Tuscaloosa.

Joining Mancini at the top of this year's AAPG awardees list is past AAPG president Peter R. Rose, also an Honorary member and retired founder and president of Rose & Associates, Austin, Texas, who is this year's recipient of the Michel T. Halbouty Outstanding Leadership Award.

Also honored at the opening session will be James A. Hartman, this year's winner of the L. Austin Weeks Memorial Award, the AAPG Foundation's highest award.

They and 49 others will be honored during the ACE opening session, set for Sunday, April 6, at 4 p.m. at the George R. Brown Convention Center.

The program is preceded in the same room at 3 p.m. by the AAPG Imperial Barrel Award ceremony.

In addition to honoring the awardees, the multi-media spiced opening session also will feature the presidential address from AAPG President Lee Krystinik.

AAPG awards, approved by the

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

Mancini, when he receives his award in Houston, will become the 67th Powers medalist in AAPG history, first awarded in 1945 to legendary geologist Wallace E. Pratt.

The Powers Award is given annually in recognition of distinguished and outstanding contributions to, or achievements in, petroleum geology.

Mancini began his career with Cities Service Co. as an exploration geologist in 1974. Two years later he became assistant professor in the department of geological sciences at the University of Alabama (UA).

He was appointed state geologist and director for the Geological Survey of Alabama, and oil and gas supervisor and director for the State of Alabama Oil and Gas Board in 1982, where he served simultaneously until 1996.

Mancini founded the UA's Center for Sedimentary Basin Studies, an interdisciplinary geoscience research center, in 1998 and served as interim chair of the Department of Geological Sciences.

Mancini has been the recipient of several AAPG awards including the A.I. Levorsen Award, in 1980 and the Distinguished Educator Award 2000. He also served as AAPG elected editor 2004-07.

He was appointed Distinguished Research Professor of the University of Alabama in 2005, was named the

Blackmon-Moody Outstanding Professor in 2007, and he received the Burnum Distinguished Professor Award and became professor emeritus in 2010. (See related story, page 16.)

Rose, who is the eighth recipient of the Halbouty Outstanding Leadership Award, given in recognition of outstanding and exceptional leadership in the petroleum geosciences, received AAPG Honorary membership in 2002.

His book "Risk Analysis and Management of Petroleum Exploration Ventures" has been widely referenced by the industry since 2001. He was columnist of the AAPG EXPLORER "Business Side of Geology," 2001-03, and served on the AAPG Executive Committee as president-elect/president from 2004-06. (See related story, page 44.)

Hartman, an AAPG Honorary member, will receive the Weeks Award in recognition of his "extraordinary philanthropy and service" to and for the AAPG Foundation.

Biographies and citations of all award winners will be included in a future BULLETIN.

Award winners who will be honored along with Mancini, Rose and Hartman in Houston are:

### Honorary Member Award

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

□ John M. Armentrout, Cascade Stratigraphic Inc., Damascus, Ore.

□ István Bérczi, MOL Group, Budapest, Hungary.

□ Donald D. Clarke, consultant, Lakewood, Calif.

□ Martin D. Hewitt, Calgary, Canada.

□ James S. McGray, Mid-Con Energy, Tulsa.

### Norman H. Foster

#### Outstanding Explorer Award

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

□ Orion Lea Skinner, Whiting Petroleum, Parker, Colo.

Skinner was responsible for Whiting's Pronghorn Field discovery and his contributions to Bakken exploration in Stark County, N.D. (See related story, page 50.)

### Robert R. Berg

#### Outstanding Research Award

AAPG's newest award, presented to honor a singular achievement in petroleum geoscience research.

□ Kevin M. Bohacs, ExxonMobil Upstream Research Co., Houston. (See related story, page 48.)

□ Robert G. Loucks, Bureau of Economic Geology, Austin, Texas. (See related story, page 52.)

See Awardees, page 24



COOPER



FOSSUM



GOOLSBY



CARTWRIGHT



EBERLI



KERANS



LOWE



CURTIS



MATTHEWS III



THOMPSON



SPASOJEVIC



GURNIS



BREYER



ENGLISH



BASU



BARZOLA

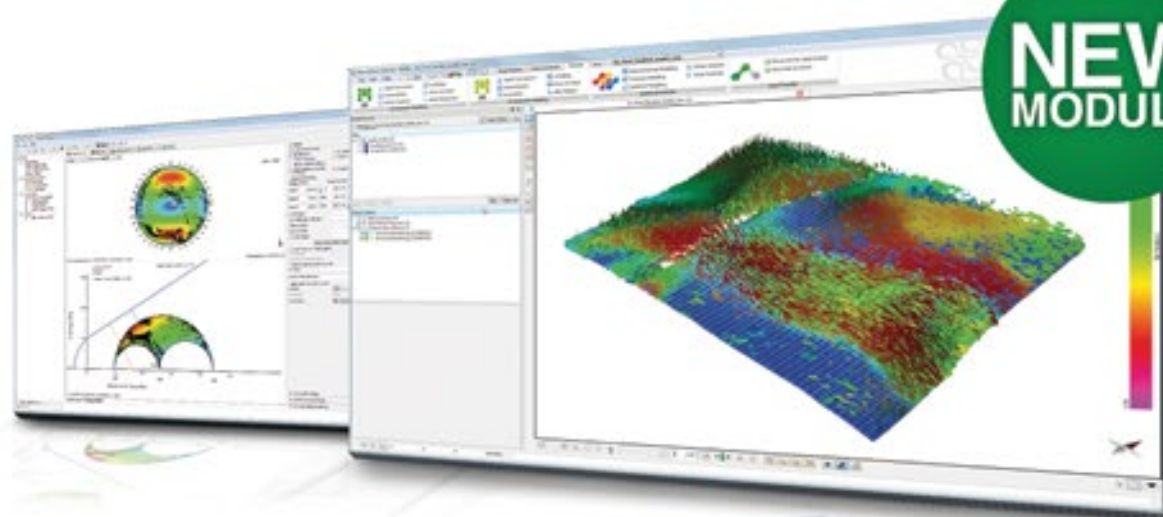




Move is a **single application** to help you **build, test and validate** your geological model using **geometric** and **geomechanical techniques**.



Available for



## New for 2014

- ✓ Stress Analysis module
- ✓ 3D well log visualization
- ✓ 3D seismic visualization
- ✓ Auto polygon and Tidy Tool improvements
- ✓ New depth to detachment method in Fault Construction tool
- ✓ Updated user interface and improved model building and editing tools



For further information visit [www.mve.com/software](http://www.mve.com/software) or contact us on **E:** [info@mve.com](mailto:info@mve.com) or **T:** +44 (0) 141 332 2681  
Midland Valley, 2 West Regent Street, Glasgow G2 1RW

VISIT US AT THE AAPG ACE IN HOUSTON **BOOTH #2242**



*Unconventional success  
requires  
Unconventional thinking*

**dig** delivers quick answers to  
questions that arise in the  
fast-paced world of unconventional  
resource plays.

Our Services:

**Stable Isotope Lab  
Consulting Services  
Basin Studies**



**dig**  
Dolan Integration Group

**Geochemistry for Energy™**

**Learn more: [digforenergy.com](http://digforenergy.com)  
(303) 531-2030**



BELLO



CLARKE



VILORIA



HOLTkamp



CHOPRA



SHARMA



ARANGO



CASTILLO

**Awardees**  
from page 22

**Distinguished Service Award**

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

This year there are nine recipients of the honor:

- Hussain M. Al-Otaibi, Saudi Aramco, Dhahran, Saudi Arabia.
- Donna S. Anderson, EOG Resources Inc., Golden, Colo.
- William P. Bosworth, Apache Egypt Companies, Houston.
- Peter Burri, Burri Oil and Gas Consulting, Basel, Switzerland.
- Michael R. Canich Jr., Sylvan Energy, Pittsburgh.
- David R. Cook, retired, Maldon, England.
- Mark Cooper, Sherwood Geoconsulting, Calgary, Canada.
- Brett J. Fossum, ConocoPhillips, Houston.
- Steven M. Goolsby, Goolsby Brothers & Associates, Lakewood, Colo.

**Grover E. Murray**

**Distinguished Educator Award**

Presented for distinguished and outstanding contributions to geological education, both at the university level and toward education of the general public.

- Joseph A. Cartwright, University of Oxford, Oxford, England.
- Gregor P. Eberli, University of Miami, Miami, Fla.
- Charles Kerans, University of Texas at Austin.
- Donald R. Lowe, Stanford University, Stanford, Calif.

**Public Service Award**

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

- John B. Curtis, Colorado School of Mines, Golden, Colo.
- Curtis is being honored for his extensive work in educating government officials and

the public on matters involving the energy industry. (Related story will be in the May EXPLORER.)

**Pioneer Award**

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

This year there are two winners of the award:

- Vincent Matthews III, Leadville Geology, Leadville, Colo.
- Thomas L. Thompson, Geo Thompson Discovery Inc., Boulder, Colo.

**Wallace E. Pratt Memorial Award**

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

- Sonja Spasojevic and Michael Gurnis, for “Sea Level and Vertical Motion of Continents from Dynamic Earth Model Since the Late Cretaceous,” which appeared in the November 2012 BULLETIN.

Spasojevic is with BP, Houston, and Gurnis is with the California Institute of Technology, Pasadena, Calif.

**Robert H. Dott Sr.  
Memorial Award**

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

- John A. Breyer for Memoir 97 “Shale Reservoirs: Giant Resources for the 21st Century.”

Breyer is with Marathon Oil, Houston.

**J.C. “Cam” Sproule  
Memorial Award**

Presented to recognize and reward younger authors of papers applicable to petroleum geology.

- Joseph M. English, for the paper “Thermomechanical Origin of Regional Fracture Systems.”

English is with Petroceltic International, Dublin, Ireland.

**See Honors, page 26**



CASTRO



RAMIREZ

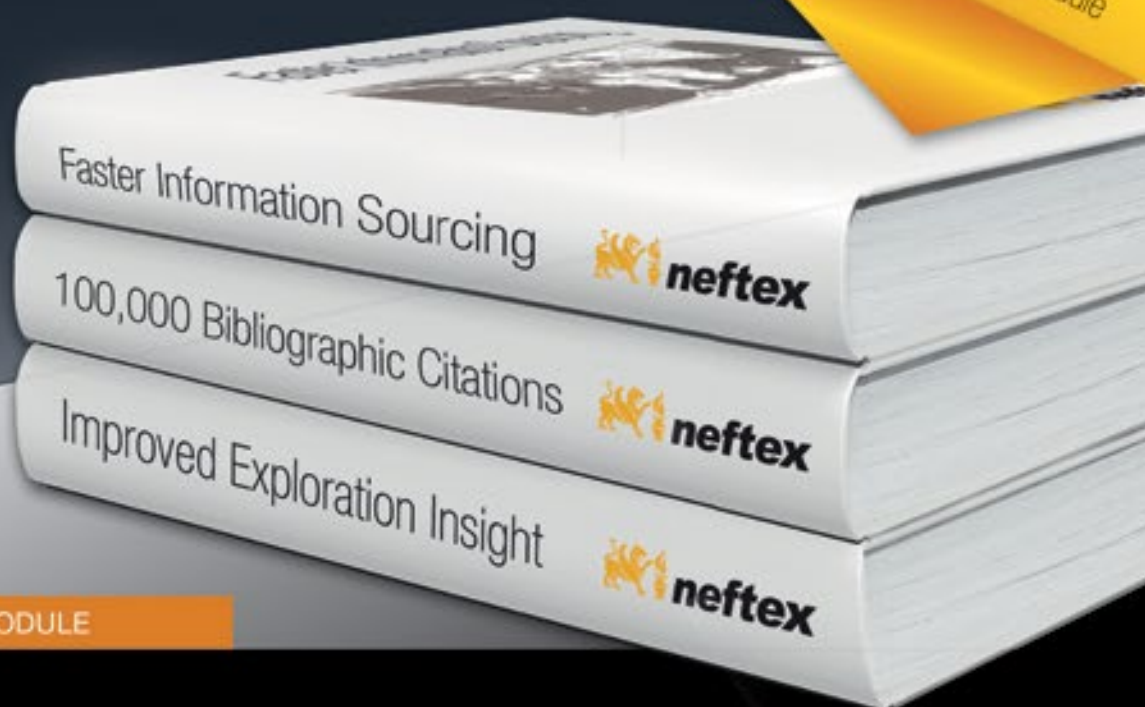


MORA



BLANCO





NEFTEX EARTH MODEL: EARTHSEARCH MODULE

# The Geoscience Research Engine

Search • Discover • Explore

A new product within the Neftex Earth Model product suite, our EarthSearch Module is an innovative research tool that offers access to an extensive database of over 100,000 geoscience literature citations.

With intuitive features designed for geoscientists including spatial, temporal and geoscience filters, EarthSearch provides reliable scientific insight and allows you to confidently and efficiently assess your basin or regions geological characteristics and petroleum potential.

Whether you're looking for data within a specific area, trying to find analogues, or deciding if a basin is worth investment, this database is the starting point for all exploration research.

Your *EarthSearch* for exploration starts here!



Our spatial interface allows you to search for references in specific areas, including conjugate margins

Contact us today to find out more:

Website: [www.neftex.com](http://www.neftex.com)

Email: [enquiries@neftex.com](mailto:enquiries@neftex.com)

Tel: +44 (0)1235 442699

Facebook: [www.facebook.com/neftex](https://www.facebook.com/neftex)

Neftex • 97 Jubilee Avenue • OX14 4RW • UK

Now Explore







CEBALLOS



SAMPSON



SWITCH



TINKER



LYNCH



HEATH



BRITT



ROGERS

## Honors from page 24

### John W. Shelton Search and Discovery Award

Presented in recognition of the best contribution to the "Search and Discovery" website in the past year.

□ Neil K. Basu, Gervasio J. Barzola, Hector Bello, Paul R. Clarke and Oswaldo E. Viloria for the paper "Integrated Eagle Ford Reservoir Characterization – Which Data is Critical to Collect and Best Describes Well Performance?"

All are with Pioneer Natural Resources, Irving, Texas.

### George C. Matson Award

Presented to honor and reward the best oral presentation at the 2013 AAPG Annual Convention and Exhibition in Pittsburgh, Pa.

□ Stephen G. Holtkamp, for the paper "A More Complete Catalog of the 2011 Youngstown, Ohio, Earthquake Sequence From Template Matching Reveals a Strong Correlation to Pumping at a Wastewater Injection Well."

Holtkamp's co-authors are Brian Currie and Michael R. Brudzinski. (All are with Miami University, Oxford, Ohio.)

(A story on Holtkamp's work appeared in the September 2013 EXPLORER.)

### Jules Braunstein Memorial Award

Presented to honor and reward the best poster presentation at the 2013 AAPG Annual Convention and Exhibition in Pittsburgh, Pa.

□ Satinder Chopra and Ritesh Kumar Sharma, for the poster "New Seismic Attribute for Determination of Lithology and Brittleness."

Both Chopra and Sharma are with Arcis Seismic Solutions, Calgary, Canada. Chopra also is the current editor of the EXPLORER's popular Geophysical Corner column.

### Gabriel Dengo Memorial Award

Presented to honor and reward the best oral presentation at the 2013 AAPG International Conference and Exhibition in Cartagena, Colombia.

□ Irene Arango, with Chevron, Houston, for the paper "Evaluating Hydrocarbon Expulsion Efficiency from Shale Reservoirs."

### Ziad Beydoun Memorial Award

Presented to honor and reward the best poster presentation at the 2013 AAPG International Conference and Exhibition in Cartagena, Colombia.

□ Jaime Castillo, Victor Castro, Alfredo Ramirez, Carlos Mora, Paola Blanco and Claudia Ceballos, for the poster "Cupiagua Sur XN1Z – Drilling Experience: Response and Uncertainty Management for Unexpected Overburden Sections."

All of the co-authors are with Equion Energia, Bogota, Colombia.

### Geosciences in the Media Award

Presented for notable journalistic achievement in any medium, which contributes to public understanding of geology, energy resources or the technology of oil and gas exploration. This year there are two awards being presented – one to the author and on-air host of a popular television series, the second to a project/film that enjoyed a major U.S. theatrical release in 2013 and has been seen by millions of people around the world.

Stories on both winners will be featured in the May EXPLORER.

□ Scott D. Sampson, author of "Dinosaur Odyssey: Fossil Threads in the Web of Life," and consultant/on-air host of the Discovery Channel series "Dinosaur Planet."

□ The "Switch" Energy Project, a documentary film and media outreach initiative that takes a look into the world's energy future. The Project includes an ongoing website, Facebook page, social media and the Switch Energy Lab.

Accepting the award will be past AAPG president Scott Tinker, who served as the film's co-producer and narrator, and "Switch" director and co-producer Harry Lynch.

### House of Delegates Honorary Member

The AAPG House of Delegates' highest award.

□ Edward W. Heath, independent, Durango, Colo.

### House of Delegates Distinguished Member

□ Paul W. Britt, Texplot, Houston.

□ Margaret Anne Rogers, Margaret A. Rogers Assoc., Los Alamos, N.M.

## Warning: Our data has gone mobile

(You may never return to the office)

**gDC**  
geoLOGIC DataCenter



Now, get **geoLOGIC's** value-added data almost any place, any time, any way you want it. Available through **gDCweb** on your tablet, smartphone or computer.

With 30 years of data experience behind it, **gDC** is the source for high quality, value-added well and land data from across Western Canada and the Northern United States. Another plus – our data is accessible through an expanding range of industry software utilizing our own easy-to-use **gDC GIS** and our **geoSCOUT** software.

View, search, import and export well, land and production data, documents, logs and more from almost anywhere. For more information visit our website at [www.geoLOGIC.com](http://www.geoLOGIC.com)



Leading the way with customer-driven data, integrated software and services for your upstream decision-making needs.

geoSCOUT | gDC | petroCUBE at [www.geoLOGIC.com](http://www.geoLOGIC.com)



# SEE THE ENERGY

## U.S. SMART RASTERS AND WELL PERFORMANCE DATA

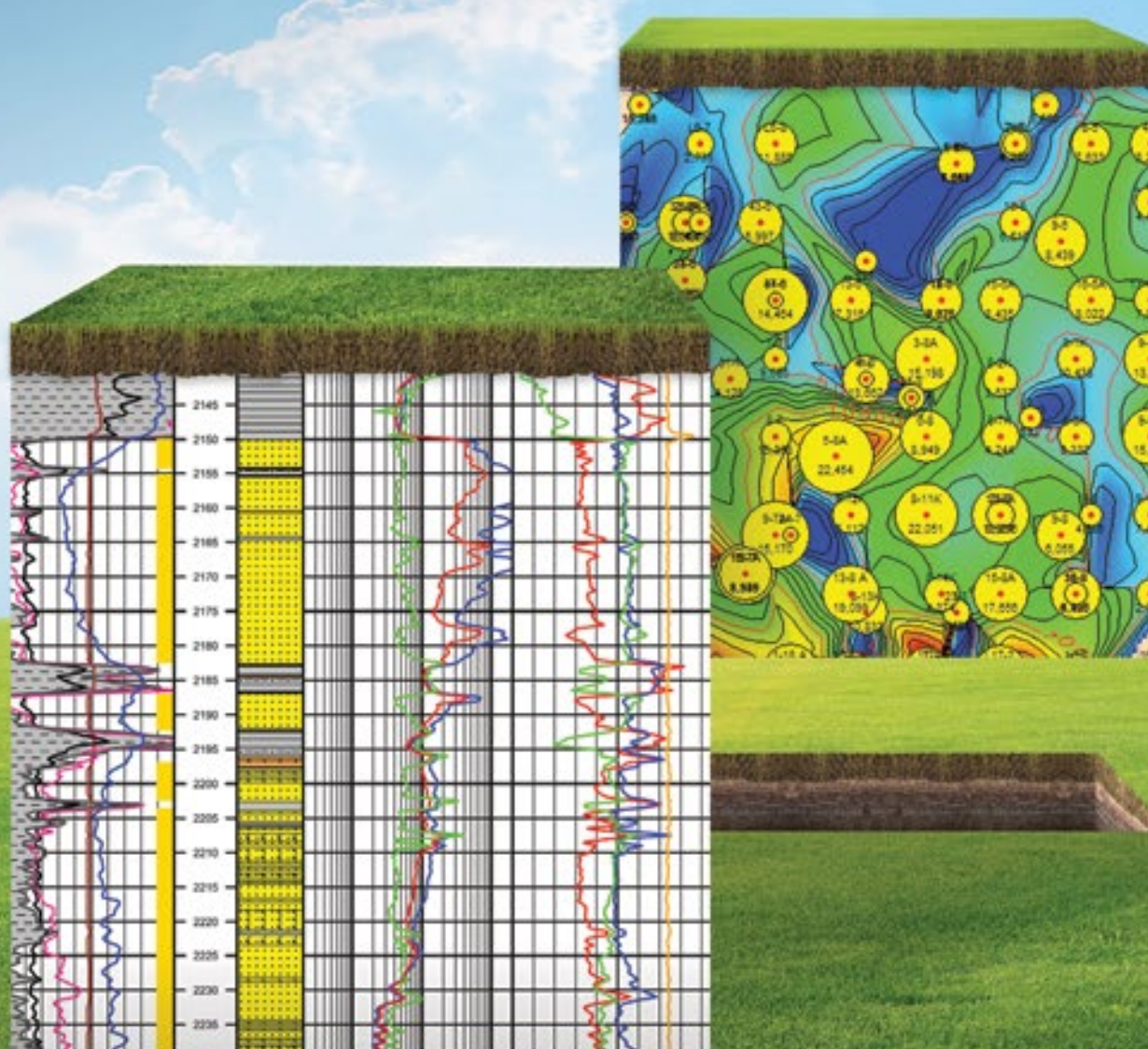
TGS offers a cost effective way for oil and gas companies to quickly identify and evaluate new prospects across the country.

- Nationwide well header/identification data for more than four million well records
- Depth-registered (smartRASTER®) log images and standard images from more than six million logs
- Detailed US production volumes for approximately 2.1 million wells
- Use of TGS Longbow™, a search and visualization tool

For more information, contact TGS at:

Tel: +1 713 860 2100

Email: [info@tgs.com](mailto:info@tgs.com)



[WWW.TGS.COM](http://WWW.TGS.COM)

© 2013 TGS-NOPEC GEOPHYSICAL COMPANY ASA. ALL RIGHTS RESERVED.

**TGS**  See the energy.



# Lost in Translation: How Do We Communicate?

By LOUISE S. DURHAM, EXPLORER Correspondent

Say you're in a local coffee emporium sporting an energy meeting ID tag.

The person next to you says:

*"Tell me about this oil and gas business; I keep hearing all kinds of different, often conflicting things about it."*

What do you do?

Likely, you may be inclined to bolt through the doors ASAP.

This is such a complex, multi-faceted industry and profession that trying to explain it even within a whole day's time wouldn't make a dent.

The lack of knowledge overall for the layperson is understandable given the expertise and usually complex route it takes to go from an idea, an unusual geologic outcrop, a map or whatever to eventually arrive at even one economically productive well.

There's been plenty of rhetoric about "getting our story out," but getting the right message(s) into the public domain is an immense challenge.

You can think really big and suggest an over-the-top commercial during the annual Super Bowl game watched by millions of people worldwide.

But defining the energy industry is a whole different breed of cat than touting a hot new car.

"One thing we do is use a lot of jargon that (confuses) the non-scientist," said AAPG member Cindy Yeilding, vice president of exploration and appraisal at BP and a moderator for the Communicating Our Science panel scheduled for this year's ACE in Houston.



YEILDING

"We don't have the really high-level story," she said. "We all tell the story in different ways, and the press, regulators and general public hear different things from all of us."

**"One thing we do is use a lot of jargon that (confuses) the non-scientist."**

"As an industry, we don't coordinate our message," she emphasized.

"One thing we want to do is send a common message to students that geoscience is great," Yeilding said. "For

instance, STEM is a fabulous direction to go."

## Searching for the Key (Message)

In fact, the STEM (Science, Technology, Engineering, Mathematics) Education Coalition is a big topic these days.

Perhaps more industry association meeting sessions focused just on the industry's "message" issues can stir folks up enough to lead to formation of a group of experts to kick-start (and oversee) a dedicated thrust for this issue.

See **Science**, page 32

## Communicating Our Science Forum Set April 7 at ACE

**"C**ommunicating Our Science," a special forum dealing with what and how to communicate with the public and media about sensitive topics in energy and science, will be held from 8-11:50 a.m. on Monday, April 7, during the AAPG Annual Convention and Exhibition in Houston.

Handling the talks and answering the questions will be a panel of six experts with vast experiences in excelling in the worlds of science, energy, industry and communications.

Panel members on tap to appear are:

▶ **Jim Reilly II**, an AAPG member and former NASA astronaut; associate

vice president and dean of science and technology development, American Public University System.

▶ **Michael Zehr**, Federal Policy Advisory, Consumer Energy Alliance.

▶ **Heather Saucier**, award-winning writer, former corporate communications adviser for Aramco Services Co. in Houston, and an EXPLORER correspondent.

▶ **Jane Whaley**, an AAPG member and editor-in-chief of GeoExPro Magazine.

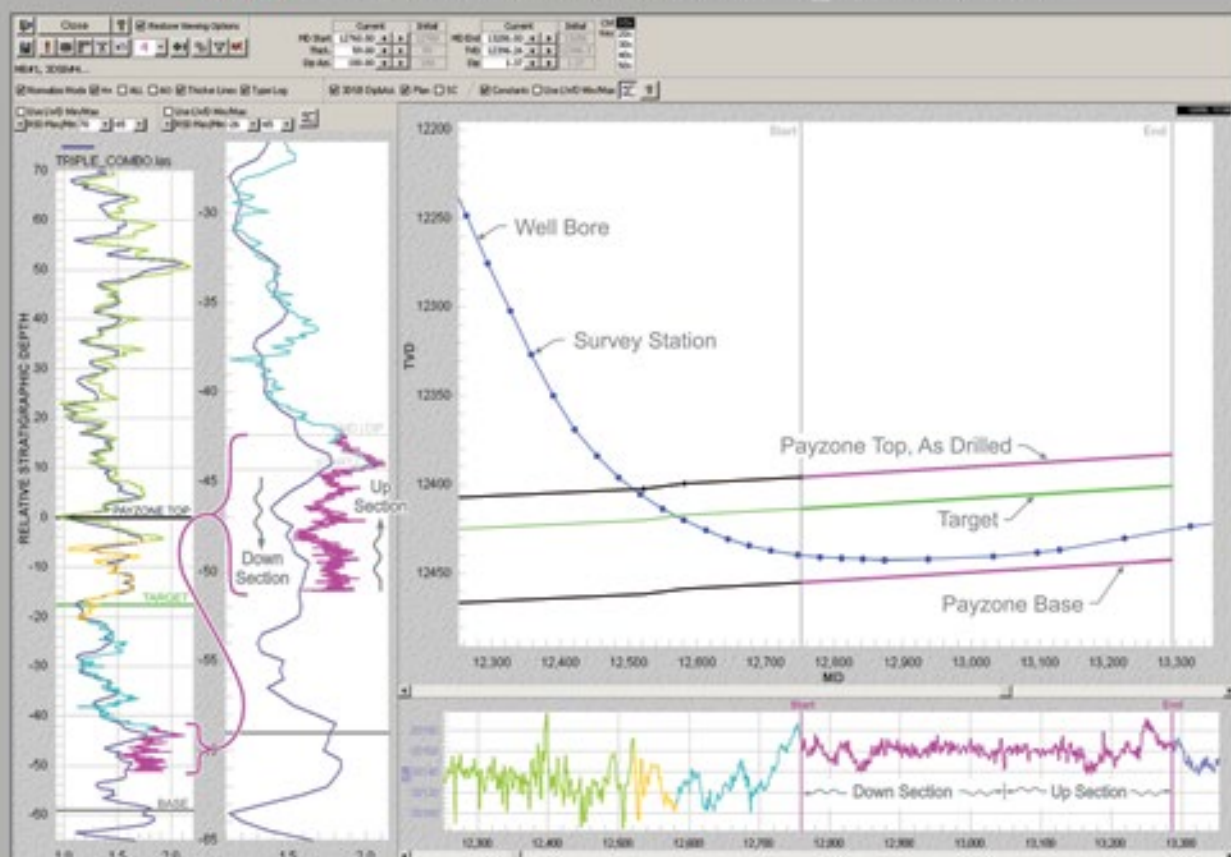
▶ **Donald Paul**, executive director, University of Southern California Energy

Institute; professor of engineering and William M. Keck Chair of Energy Resources, University of Southern California.

▶ **Iain Stewart**, president of the Royal Scottish Geographical Society, a Fellow of the Geological Society of London and a BBC "rock star" known for several geology-science TV-series, including "Earth: The Power of the Planet" and "Journeys From the Centre of the Earth," which also was shown in the United States on the Discovery Channel as "Hot Rocks: Geology of Civilization." He also is professor of geoscience communication at Plymouth University, Dover, England – believed to be a one-of-a-kind position.

# Land your horizontal with *confidence!*

## SES is Technical Geosteering Software



**SES** is for geologists who are dissatisfied with drafting or gridding-tool methods of geosteering horizontal wellbores. **SES** is 3D technical geosteering software that makes wellbore stratigraphic tracking quick-n-easy, accurate, and easily shared. Unlike any other geosteering software, **SES** provides a complete suite of software features to handle your horizontal drilling needs.

To learn more and get a free trial, please contact us at...

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

Phone 720-279-0182  
support@makinhole.com



★ Drill more horizontal pay!

★ Reduce pilot holes!

★ 85+ clients and growing!

★ Free trial software and video!



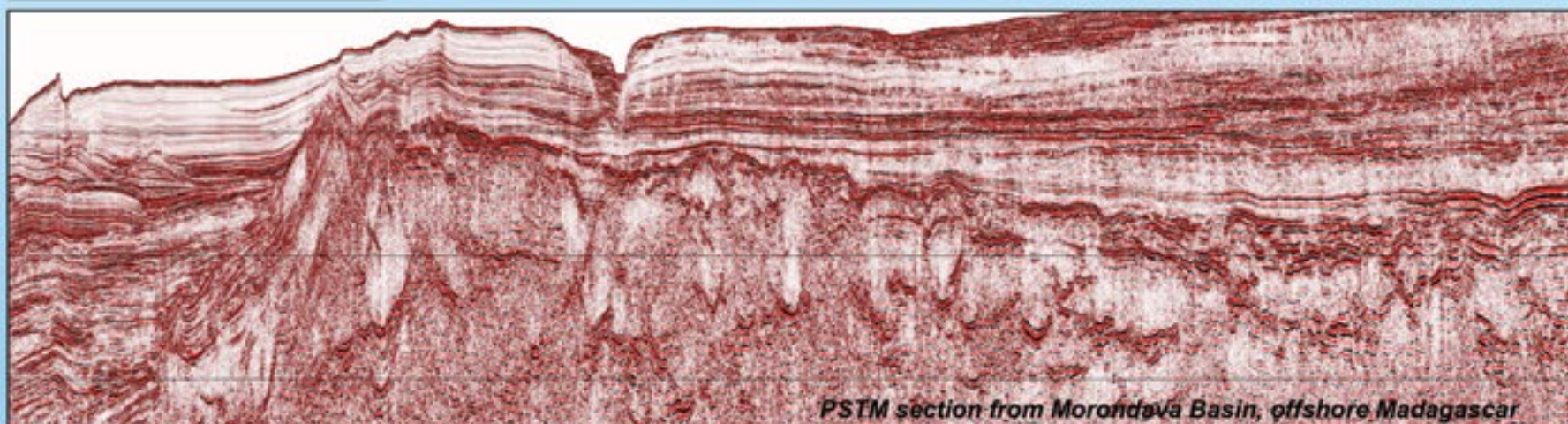


## Offshore Madagascar Multi-client 2D (Cooperate with TGS)

Location: Offshore Morondava Basin & Majunga Basin.

- Phase 1: Survey size: 13,134 km, marked in blue. Acquisition and PSTM were completed in May and October 2013 respectively. PSDM is estimated to be ready in Q2 2014.
- Phase 2: Survey size: 6,657 km, marked in purple. Data acquisition commenced in October 2013, and completed in January 2014. PSTM is estimated to be available in Q2 2014.

OMNIS will launch a bid round in Morondava Basin area covered by the program in 2014.



PSTM section from Morondava Basin, offshore Madagascar



## Onshore Mozambique Multi-client 2D

Location: Onshore Mozambique Basin.

Survey size: 4,160 km.

The program includes three surveys: Onshore Zambezi, South Mozambique and Mazenga Block. Three surveys will be planned and implemented separately.

First project is planned to start in Q3 2014 depending on the EIA progress and prefunding.

INP will launch a bid round after the program.



## Offshore Equatorial Guinea Multi-client 3D (Cooperate with Geoex)

Location: Offshore Douala Basin.

Survey size: 4,753 km<sup>2</sup>.

- Phase 1: F13/G13, I13/I14, with acreage of 3000 km<sup>2</sup>. Acquisition was completed in October 2013, and PSTM is estimated to be ready in Q2 2014.
- Phase 2: F12/G12/H12, 1753 km<sup>2</sup>. Data acquisition started in January 2014, and finished in February 2014. PSTM is estimated to be ready in Q3 2014.

MMIE announced that the bid round for the survey area would be held in March/April 2014.



Contact up for more information:

Tel : +86 312 3737449  
Fax: +86 10 81201392

Email: [multiclient@bpg.com.cn](mailto:multiclient@bpg.com.cn)  
Web : [www.bpg.com.cn](http://www.bpg.com.cn)



Welcome to our booth in  
the 5th Eastern Africa  
Oil, Gas &  
Energy  
2014



## Discovery Thinking: Twice as Good

By HEATHER SAUCIER, EXPLORER Correspondent

**H**ow do you improve on a good thing?

If it's the AAPG Discovery Thinking forum, an event that has grown in popularity since its inception in 2008, organizers have a simple answer:

You try to make it twice as good.

So now, for only the second time in the event's history, the Discovery Thinking forum set for this year's Annual Convention and Exhibition in Houston will have not one, but two sessions – an enhancement designed to accommodate a growing number of must-be-told stories about major discoveries around the globe as well as the ideas, technology and

guts that made them happen.

"Explorers like to tell stories around the campfire, and the stories they like to tell are about discoveries," said AAPG Honorary member Charles A. Sternbach, president of Star Creek Energy Company and founder and co-chair of the Discovery Thinking forum. "The whole purpose of Discovery Thinking is to discuss promising new plays and major new



STERNBACH

discoveries by people who know those discoveries well.

"We are fortunate that they share their insights on how the discovery was created," he added.

This year's forums will be held Monday, April 7, as eight geoscientists discuss new reserves, unconventional resources, payoffs from persistence and the application of highly specialized technology. (See accompanying story for a complete list of presentations.)

Many will use visual and technical data to give "tours" of their processes,

See [Discovery](#), page 32

## Experts, Ideas Set for Discovery Thinking Forum

**T**his year there will be two Discovery Thinking Forums at the AAPG Annual Convention and Exhibition – one in the afternoon, one in the morning. Here's what you can expect:

### Morning Session

► **Antonio Escalera**, deputy director of exploration and production, Pemex, talking about "Recent Discoveries in Ultra Deep Water Western Gulf of Mexico."

Highlight – Major new oil reserves in the Gulf of Mexico unveiled by Mexico might open possibilities for capital investment in deepwater discoveries.

► **Hans Rønnevik**, exploration manager, and **Arild Jørstad**, Lundin, talking about "Unfolding by Holistic Thinking, Giant and Significant Oil Discoveries in a Mature Area; Discovery of Edvard Grieg, Johan Sverdrup and Luno II in the Norwegian North Sea."

Highlight – Insights into petroleum migration and careful data collection and interpretation, creativity and sheer persistence led to major new oil discoveries in the North Sea.

► **Flavio Juarez Feijo**, senior geologist, Petrobras, talking about "Sergipe Basin, An Oil Province Reborn."

Highlight – By continuing to learn and drill deeper in the Sergipe Basin, explorers have found tremendous new oil reserves in a mature basin.

► **Fiona MacAulay**, technical director, Rockhopper Exploration, talking about "Size Doesn't Always Matter: Twelve Months in the Life of a Small Oil Company – The Discovery and Appraisal of the Sea Lion Field, North Falklands Basin."

Highlight – A major discovery near the Falkland Islands shows how many small companies are willing to take large risks for discoveries.

### Afternoon Session

► **John Dribus**, global geosciences adviser, Schlumberger, talking about "Three Important Conventional Reservoirs Receiving Exploration Focus in the Deep Water Today."

Highlight – Take a private "tour" of some of the giant discoveries of the Atlantic Margin.

► **Ernie Leyendecker**, vice president of exploration-Gulf of Mexico, Anadarko, talking about "Discovery Thinking: The Gulf of Mexico Advantage." Highlight – Anadarko, how they did it.

► **Scott Sheffield**, chief executive officer, Pioneer Resources, talking about "Discovery Thinking Leads to Success in Eagle Ford and Spraberry/Wolfcamp Plays, Texas."

Highlight – The story of unconventional discoveries in Texas is told directly from the man at the top.

► **Kristin Wood**, Mesozoic area exploration manager, Shell, talking about "Appomattox Persistence Pays Off in a Frontier Gulf of Mexico Play."

Highlight – Exploration of Mesozoic reservoirs is leading to new discoveries in the eastern Gulf of Mexico.

– HEATHER SAUCIER

WIRELINE SERVICES

## Quality Data. Every Well. Every Time.

**RISK CONTROL**

Our tool-retrieval-at-surface rate is

# 99.93%

for 533,621 jobs over 8 years

**EFFICIENCY**

Our services incur minimal NPT with a

# 96.97%

operating efficiency measured over 206,981 annual operating hours

**TECHNOLOGY**

Our unique R&D program has developed

# 20

openhole and cased-hole wireline technologies in the last 5 years

Our international fleet of 700 wireline units performs more than 37,000 trips to the well site every year in 71 countries. With a comprehensive selection of proprietary technologies and robust R&D efforts, we deliver critical subsurface information for your well.

We are the industry leader and innovator in multi-conveyance logging, offering ten different techniques to deploy our high-quality Compact™ tools.

Contact and collaborate with us at [wireline@weatherford.com](mailto:wireline@weatherford.com)

© 2014 Weatherford. All rights reserved.

## Weatherford

Formation Evaluation | Well Construction | Completion | Production

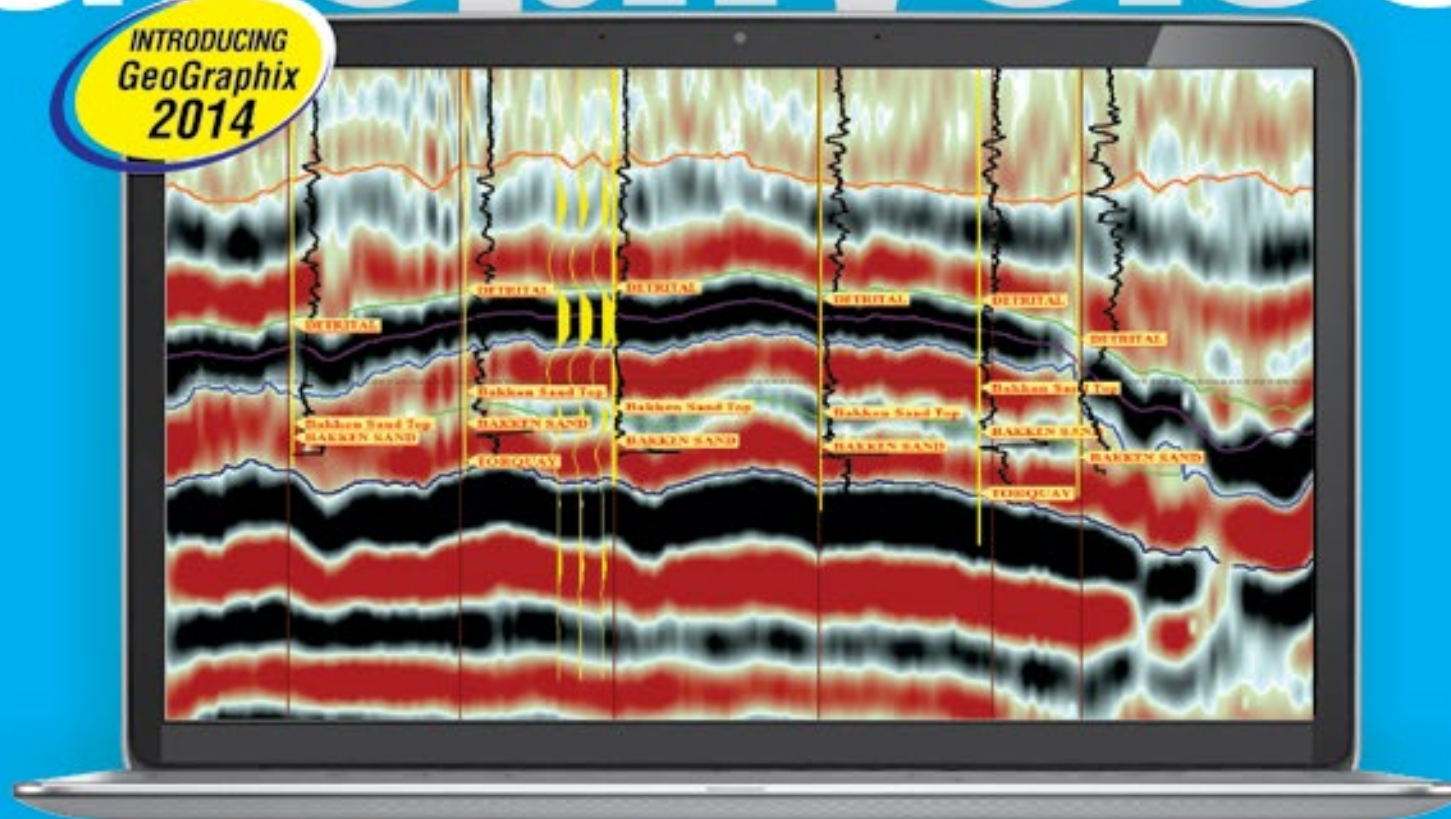


www.lmkr.com/geographix

Visit us at AAPG ACE booth1225  
to see GeoGraphix 2014 in action!

# Geophysics

INTRODUCING  
GeoGraphix  
2014



## Maximize your reservoir understanding through seamless interpretation of seismic and geological data

- Experience the power of geophysical interpretation using an advanced, fully integrated 2D/3D seismic interpretation system
- Easily depth convert your seismic interpretation to refine your sealed earth model
- Quickly depth convert with velocity models derived from time horizon and formation top relationships
- Generate 3D Volume Attributes and integrate seamlessly with LMKR GeoGraphix using LMKR Volume Attributes\*

\*LMKR Volume Attributes is an LMKR Product which integrates seamlessly with LMKR GeoGraphix

### Geology

Make this well better than your last through integrated multi-dimensional geological interpretation

### Field Planning

Optimize your field development efficiency with quick and easy field planning tools

### Visualization

See where your next big opportunity lies with state of the art mapping and visualization



**GeoGraphix®**

GeoGraphix® is a registered trademark of Landmark Graphics Corporation. The LMKR Logo is a trademark of LMKR Holdings. LMKR Holdings is the exclusive world-wide licensor and distributor of GeoGraphix® software.

**Discover  
Your  
Potential**

By unleashing the power of GeoGraphix



## Science from page 28

The ACE panel clearly is a step forward. At press time, Yeilding said the tentatively defined objectives of the panel at ACE include:

- ▶ Develop a picture of what GREAT scientific communication is like.
- ▶ What role can AAPG play in this communication?
- ▶ What can AAPG and other societies learn from other industries, disciplines, media?
- ▶ What are the key messages geologists need to share with the world (STEM, industry)?

"We need to decide our key messages and how to show them in a

memorable, impactful and empowering way," Yeilding said. "We have so many audiences – yet other industries take really complicated messages and figure out how to communicate them simplistically and in an engaging way.

"What lessons," she pondered aloud, "can we learn from them?"

### Something to Talk About


It is anticipated that the erudite individuals set to participate in the Communicating Our Science effort at ACE likely will have some unique ideas and timely suggestions.

(See accompanying box for panelist information.)

"There will be discussions of what and how to communicate about

sensitive topics in energy and science, and how new media are changing our communications with other scientists and the public," Yeilding noted.

Yeilding and co-moderator Colin North, also an AAPG member, plan an "open discussion" of topics such as:

- ▶ How to explain energy issues to friends, colleagues and environmental activists.
- ▶ Where energy originates.
- ▶ Pros and cons of potential energy sources for the future.
- ▶ Hydraulic fracturing.
- ▶ How 21st century media affect how we get scientific information.
- ▶ Why industry members are, or aren't, publishing scientific information that is important for those in the industry to do their jobs. 

## Discovery from page 30

Sternbach said. They will reveal the problems and challenges they faced, failures they experienced along the way and the path that led them to success.

"We get the privilege to look at major new trends and discoveries in seismic maps and vertical displays. It helps us understand how technology is applied and integrated as well as the business aspect of things," Sternbach said.

"It's a holistic view of new discoveries."

### Knowledge – and Encouragement

Discovery Thinking was launched to advance the AAPG's 100th anniversary in 2017. Co-sponsored by the AAPG and the Division of Professional Affairs, the forum addresses both the scientific and professional aspects of exploration.

As it continues to grow in popularity, its life may extend beyond the centennial year and become a traditional component of the ACE and International Conference and Exhibition.

"The program leaves a legacy of discovery and has the continuity and momentum to continue," Sternbach added.

Already, it is serving as a resource for thousands of geologists who visit the 40-plus presentations from previous forums, which are posted on the AAPG website ("Publications" tab, "Search and Discovery" button, or [www.searchanddiscovery.com/specialcollections/discoverythinking.html](http://www.searchanddiscovery.com/specialcollections/discoverythinking.html)).

The site has received more than 20,000 hits, proving that "the talks are not over when the forum is over," Sternbach said.

The presentations also serve as educational tools for young petroleum geologists.

"AAPG and DPA want to encourage young professionals entering the business to become both successful explorers and the next generation of leaders," he said. "These forums can accelerate the learning process."

### Analog

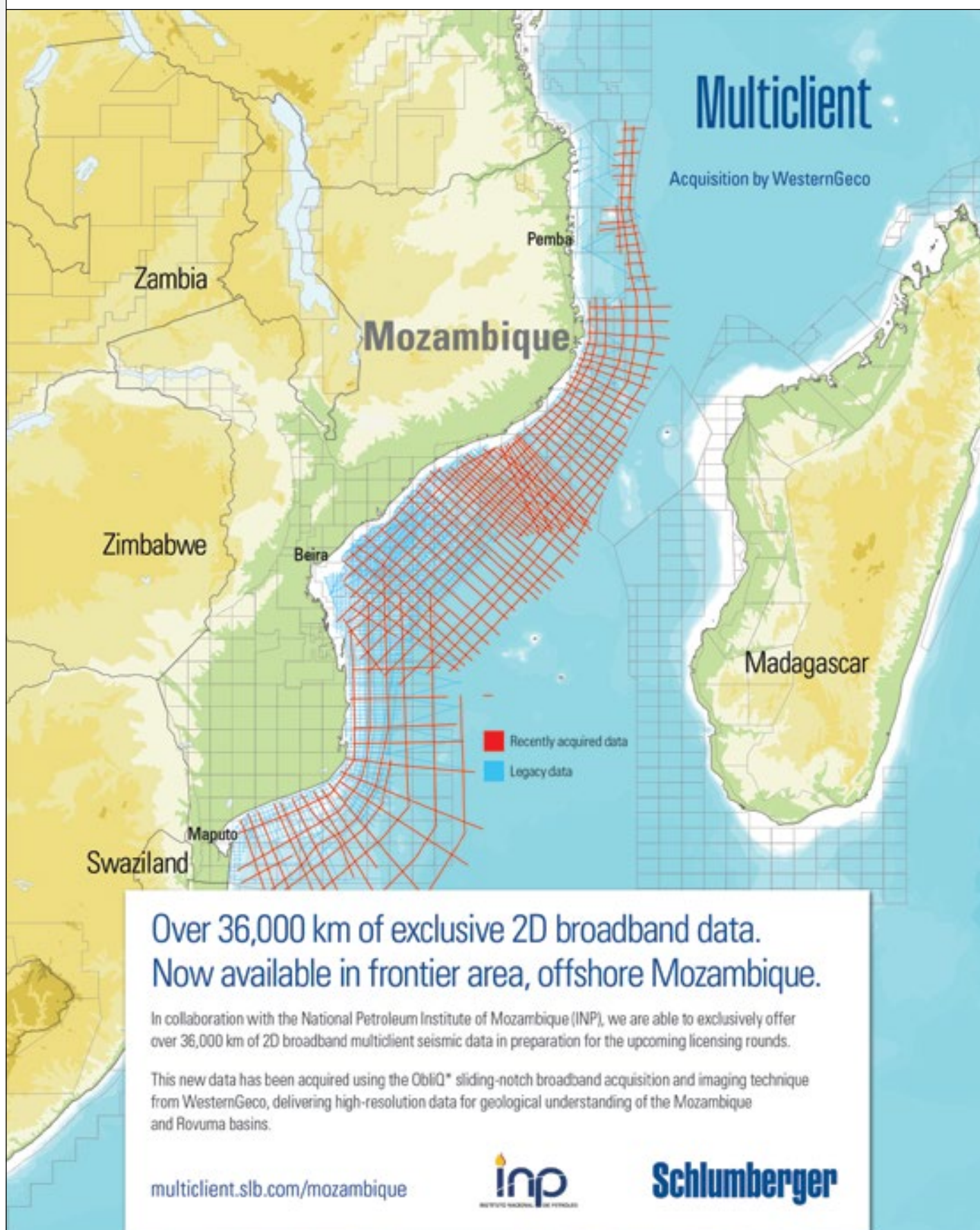
Paul Weimer, co-chair of this year's Discovery Thinking forum, a professor and director of the Energy and Minerals Applied Research Center at the University of Colorado, and a former AAPG president, said many look forward to the talks every year.

"Exploration is very much a process that is done by analog, so geologists are always looking at other basins to generate ideas for their basins," he said.

Ed Dolly, who with Weimer is co-chair of AAPG's 100th Anniversary Committee, will co-chair the afternoon session about discoveries specific to the Gulf of Mexico.

As the forum has gained momentum over the years, Sternbach said lightheartedly that it prompted him to make "new friends" in the industry.

"It's not easy for someone who's just made a giant discovery to come and tell you about it until you have a good relationship," he said. "We've continued to expand our speakers. It's really been a joy for me. I can't wait myself to learn and be inspired by these great discoveries. These programs owe a great debt to the wonderful men and women among us who share their discovery stories so that we all may aspire to be better explorers."





MORE THAN MAPPING

# WANT TO LIFT YOUR PETREL® WORKFLOWS TO NEW HEIGHTS?

VISIT US AT  
AAPG 2014  
April 6-9  
Booth #1219



Seamlessly bring more data into the fold. Dynamically present your insight like never before.

SOFTWARE

SERVICES

CONNECTIVITY

DATA MANAGEMENT

The Petrosys Plug-in for Petrel® gives you access to powerful Petrosys mapping, surface modeling and data exchange from right where you need it – inside Petrel. Now you have the power to effortlessly and meticulously bring your critical knowledge together on one potent mapping canvas. Work intuitively with your Petrel knowledge and, should you so require, simultaneously aggregate, map and model data direct from multiple other sources – OpenWorks®, ArcSDE®, IHS™ Kingdom®, PPDM™ and more. Refine, enhance and then present your results in beautiful, compelling detail. The result? Decision-making is accelerated through consistent mapping and surface modeling as focus moves from regional overview through to the field and reservoir scale. To learn more go to [www.petrosys.com.au/petrel](http://www.petrosys.com.au/petrel).

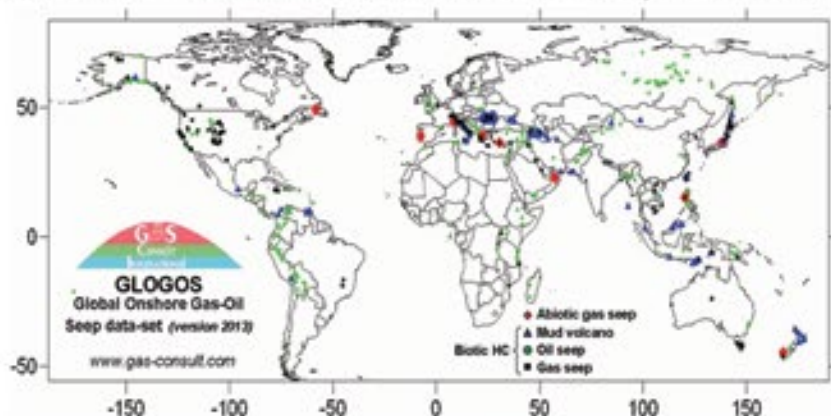
Petrel is a registered trademark of Schlumberger Limited and/or its affiliates. OpenWorks is a registered trademark of Halliburton. ESRI trademarks provided under license from ESRI. IHS and Kingdom are trademarks or registered trademarks of IHS, Inc. PPDM is a trademark of the Professional Petroleum Data Management (PPDM) Association.







## GLOGOS Global Gas and Oil Seep Database



The database contains more than 2000 locations from all continents. The database should be valuable for companies that are engaged in international exploration and lease acquisition. For example, GLOGOS contains 214 records in Romania, a country that is presently of great interest in shale gas exploration. Glogos can be acquired under a data Licensing Agreement. A demo of the database can be provided upon request.

For more info see [www.gas-consult.com](http://www.gas-consult.com) or call Martin Schoell (925) 818-0318



## Arctic Petroleum Systems Studies

### West Greenland



**SOURCE ROCK-SPECIFIC CALIBRATIONS OF KINETICS OF OIL FORMATION FOR PREDICTION OF OIL QUALITY**

#### Study Highlights

- Kinetic and Isotopic Analysis of 3 source rocks (Paleocene, Cenomanian-Campanian Kanguk Formation from Ellesmere Island, Albian Hassel Formation)

#### Key Results

- API gravity and Viscosity of oils is highly dependent on the geo-history model and can be economically risky dependent on the location of the prospect

### Barents Sea



**SOURCE ROCK-SPECIFIC CALIBRATIONS OF OIL AND GAS FORMATION FOR QUANTITATIVE PETROLEUM SYSTEM ANALYSIS NORWEGIAN BARENTS SEA**

#### Study Highlights

- Complete kinetic and Isotopic Analysis of 4 source rocks (1 Jurassic, 2 Triassic, 1 U. Permian)
- Calibrations of Gas Isotope for gas-source correlation
- Isotopic and compositional data of 50 gases

#### Key Results

- Gases are primarily from one deep source different than the oil sources. Prediction of API gravity requires migration modeling with our kinetics.

For more info see [www.gas-consult.com](http://www.gas-consult.com) or call (925) 818-0318 or [GeolisoChem Corporation](http://GeolisoChem.com) (626) 858-5077



Photo courtesy of NASA, JPL

There are portions of the moon's surface that exist in permanent shadow, where volatile fragments of asteroids and meteors have accumulated over eons and can be harvested for fuel. This oblique view of the moon's surface was photographed by the Apollo 10 astronauts in May 1969.

## New frontiers for E&P ?

# Space: A Giant Leap

By BRIAN ERVIN, EXPLORER Assistant Managing Editor

With the sole exception, perhaps, of that one time when Bruce Willis led a motley crew of astronauts and oil drillers to save the world from an asteroid, most people tend to assume petroleum geology and space exploration are, literally, worlds apart.

The former, after all, has to do with getting decayed organic material from the depths of the earth while the latter occurs, by definition, as far from geologists' area of dedicated expertise as humans have ever been, where no life has ever been known to exist.

If some investors' hopes and expectations pan out, though, that popular misconception should be dispelled in due time, as many predict that off-planet energy production will be part of the industry status quo in the decades to come.

"There is an often-asked question by AAPG members: Why is there an AAPG Astrogeology Committee?" said William Ambrose, chair of the committee in question and research scientist with the Bureau of Economic Geology at the University of Texas.

"The solar system is awash in energy resources," he said. "The space and energy frontiers are literally limitless and there's almost an inexhaustible supply of energy beyond the earth that can be accessed with a systematic and well thought-out program of human space exploration."

"The whole idea is that everything we've learned over the last 150 years in energy resources is applicable to the moon and to Mars and to asteroids in near-earth orbit," added Bruce Cutright, project manager with the Bureau of Economic Geology and another member of the AAPG Astrogeology Committee.

Ambrose and Cutright also are

co-chairs of the "Space and Energy Frontiers" technical program at AAPG's Annual Convention and Exhibition this month in Houston.

They said the word "frontier" was very deliberately chosen for the session because, with the treasure trove of knowledge that's been accumulated about the vast energy resources beyond the earth, tapping into them will open the next stage of both space exploration and energy production.



AMBROSE



CUTRIGHT

**"The next logical step, which has yet to be realized, is the exploitation of resources that can provide a springboard to further exploration of the solar system."**

"The next logical step, which has yet to be realized, is the exploitation of resources that can provide a springboard to further exploration of the solar system," Ambrose said.

"The United States has done the characterization of mineral resources ... we know where those resources are," he added. "It's just a matter of following through."

### So, What Are Those Resources?

As far as we now know there are no fossil fuels to be found in the sterile reaches of

See **Space**, page 36



**ON ANY STRETCH OF LAND,  
IN SHALLOW WATER OR DEEP,  
CAPTURE THE SEISMIC YOU NEED  
WITH LESS TROUBLE.**

**A LOT LESS  
TROUBLE.**



Dealing with piles of cable hinders any seismic acquisition, land or marine. That's why our true cable-free ZNodal® systems pay huge dividends in any environment.

Our lightweight, compact ZLand® system, now with the ability to add external sensors or available in a cable-free 3C version, lets crews work faster and much more safely, anywhere on earth.

Our ZMarine system, also completely self-contained, deploys easily and safely, even in congested areas, to water depths of 3000m, which makes it ideal for 4D reservoir monitoring.

**Visit us at AAPG Booth 2127**



SYSTEMS ACQUISITION LICENSING PROCESSING IMAGING



## Space

from page 34

outer space – but there are similar resources to be exploited.

“Chondritic asteroids in near-earth orbit are about 60 percent kerogen, which is, in essence, an organic petroleum-like compound, and all of the petroleum chemistry that we exercise on earth can be applied to the kerogen resources from the asteroids,” Cutright said. “And, we believe, there are probably abiogenic kerogen-type resources on Mars as well.”

He noted that the aforementioned technical program at ACE will include a presentation on Martian energy resources by AAPG member Lorena Moscardelli, one of his colleagues on the

**“So it makes sense to mine and refine the rocket fuel on the moon, rather than bring it up from the Earth, out of the Earth’s gravity.”**

Astrogeology Committee.

Petroleum-related resources are just one source of energy among many that are beckoning us to the stars, though.

Cutright said that as far back as 1968, extraterrestrial solar power has been considered as an obvious and abundant source of alternative energy.

“Peter Glaser was the one that wrote the first article on orbiting solar power satellites,” he said. “In essence, the first

thing in orbit around the earth is unlimited solar energy. The only thing that’s missing is the material to construct those satellites in orbit, and it’s too expensive to bring it from earth’s surface.

“So, what we need to do is go out and find sources of material outside of earth’s surface to construct those materials from,” Cutright added. “And the first place people have looked for those kinds of materials is the near-earth asteroids.”

### From the Earth to the Moon

Cutright also referenced the work of AAPG Honorary member and Apollo 17 astronaut Harrison Schmitt in detailing the plenitude of resources available on the moon.

“He’s written and published extensively on helium-3 resources for very efficient fusion energy production that is on the moon, ample resources of titanium, numerous other high-value minerals and construction material and, of course, now we’ve found water resources on the shadowed areas of the moon’s poles,” he explained.

“So, there’s no missing material beyond earth’s surface to construct long-term operations facilities and to produce energy that is economically viable for transportation from the moon to earth’s orbit or to earth’s surface, if you look at the economics of either,” Cutright added.

He also referenced a paper presented at ACE in 2011 by AAPG member Dieter Beike, “Making the Next Giant Leap in Geosciences,” in which he explained that with some vision, long-term planning and R&D investment, commercial development of lunar helium-3 as an energy source is a viable business model.

Ambrose also noted that an ample supply of energy awaits our use in the form of extraterrestrial ice.

“Basically, it’s rocket fuel,” he said, “because ice is  $H_2O$ , the hydrogen is the fuel, oxygen is the oxidizer that you use to burn the hydrogen.”

Ambrose said the moon, once again, is the nearest and most plentiful source of that untapped rocket fuel.

“There’s an incredible resource of lunar hydrogen deposits, mostly in the form of disseminated ice in the shallow lunar soil near the poles,” he explained. “The reason why they’re at the poles is that there are some areas of what we call ‘permanent shadow’ that exist at or near the poles, because the moon has almost no tilt, with respect to the sun.

“What that means is, in the floors of deep craters in polar regions, there are areas in the floors of these craters that have not seen sunlight for at least three billion years,” he continued. “So these are basically cold traps, areas where any volatiles – ammonia, water, ice, carbon dioxide, any compounds that can be introduced by the impact of water-rich asteroids – would land in those craters and just accumulate over time.”

Ambrose cited geologist and lunar scientist Paul Spudis, who estimated that sufficient ice resources exist on the moon to provide enough rocket fuel to launch the equivalent of the space shuttle from the moon’s surface every day for more than 2,000 years.

“So it makes sense to mine and refine the rocket fuel on the moon, rather than bring it up from the Earth, out of the Earth’s gravity,” he said.

“Because of the difference in gravity fields, we can go to the moon’s surface, produce fuel, and bring it up to earth’s orbit for refueling much, much cheaper than we can take fuel from earth’s surface to low-earth or high-earth orbit,” Cutright concurred, adding that it costs between \$15,000 and \$25,000 per kilogram to bring material up from the earth’s surface.

“So if you have to take a kilogram of water from earth up to orbit,” he said, “that’s like having a pocket full of gold on earth’s surface.”

**Why does Weatherford Mudlogging enjoy almost 100% customer loyalty?**

**Crew on a volcano  
in Cameroon?**  
**Dave’s on it.**

Going the extra mile is par for the course at Weatherford. So when an international oil & gas company requested a mudlogging cabin on Mount Cameroon, Dave, our logistics expert said, “No problem.” Maybe that’s why, in over 600 recent Field Service Quality Surveys, Weatherford Mudlogging was rated “good” or “excellent” 95% of the time. Whether your project is routine or extreme, you can count on Weatherford to move mountains on your behalf. It’s just one more way Weatherford Mudlogging is committed to Excellence From the Ground Up.

**EXCELLENCE  
FROM THE  
GROUND UP™**

**SURFACE LOGGING SYSTEMS**

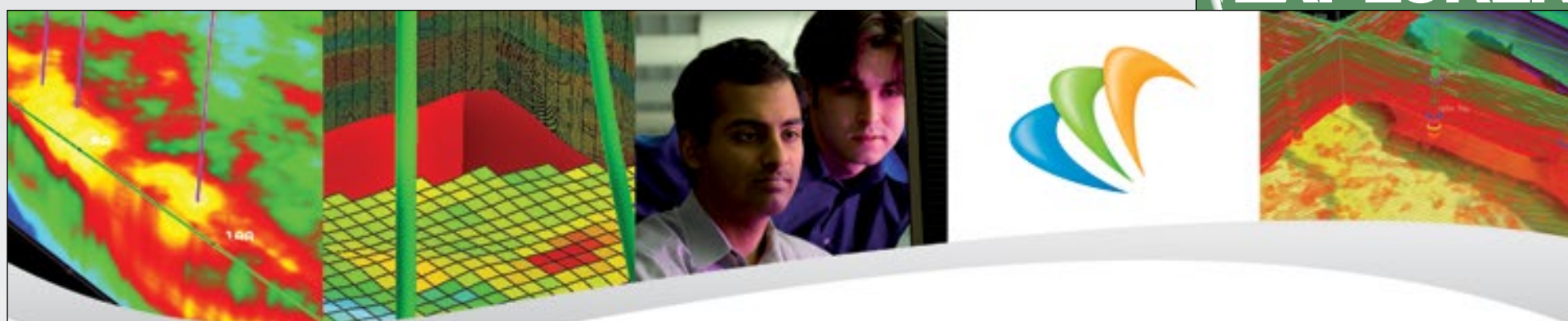
[www.weatherford.com/surfacelogging](http://www.weatherford.com/surfacelogging)  
[mudlogging.services@weatherford.com](mailto:mudlogging.services@weatherford.com)



**Weatherford®**

See **Astrogeology**, page 38

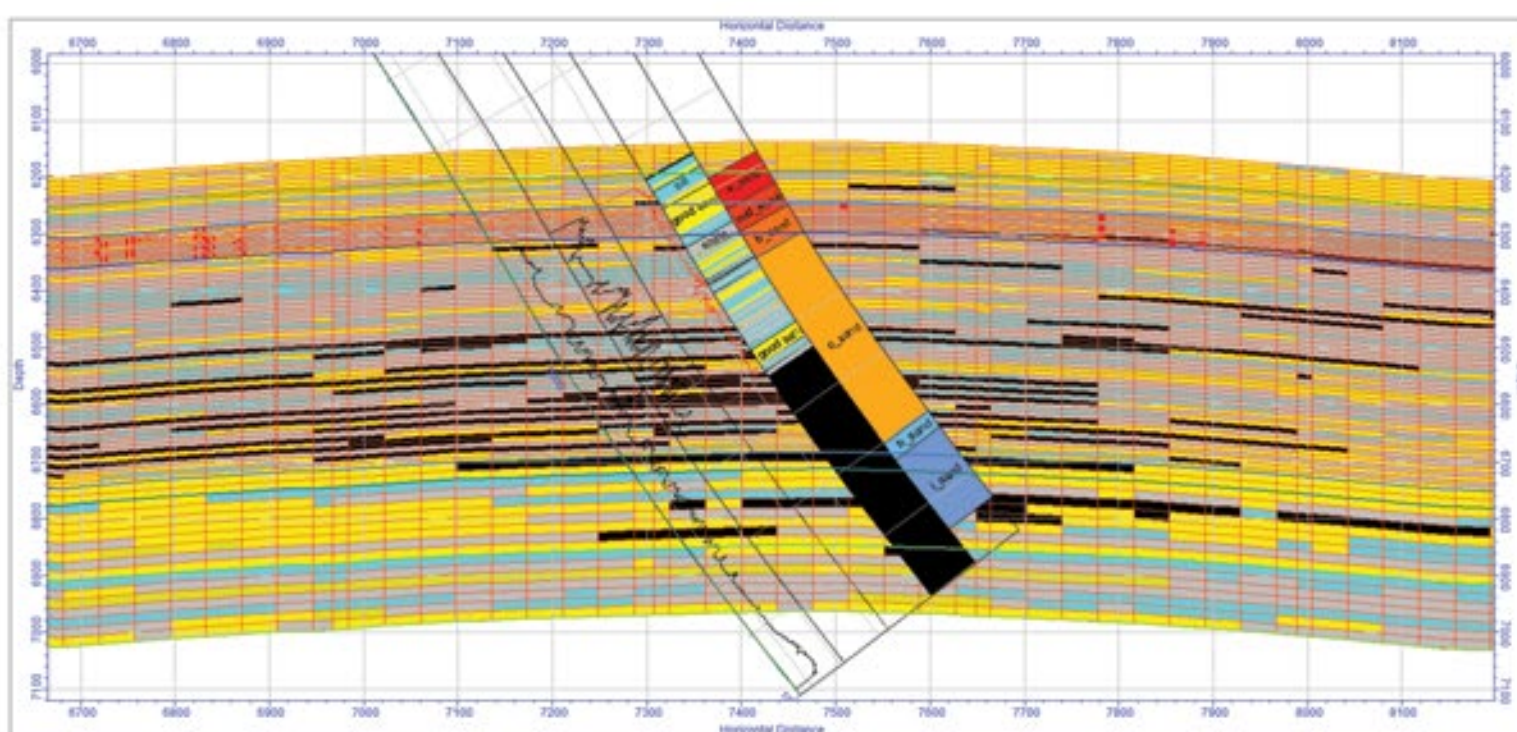




Jason

# Affordable Reservoir Modeling

Rapid answers with **EarthModel Builder**



3D model cross section of distributed facies with a deviated well displaying discrete and continuous logs.

Use **EarthModel® Builder** to construct more realistic representations of pay zones. Create a 3D model that helps you optimize field development and well planning.

This easy-to-use application combines several types of data displayed in 2D and 3D views. Incorporate the most current information as it becomes available from the field to generate multiple first-pass models with reservoir properties. Perform quick quality control along the way and develop a variety of scenarios to forecast production and predict sweep efficiency.

Learn more about CGG's robust technology portfolio at AAPG Booth 1543 in Houston or schedule a demo today.

[jason.cgg.com/earthmodel\\_builder](http://jason.cgg.com/earthmodel_builder)







Photo courtesy of NASA

This view of a Martian rock target called "Harrison" merges images from two cameras on NASA's Curiosity Mars rover. Harrison bears elongated, light-colored crystals in a darker matrix. Based on composition information, the elongated crystals are likely feldspars, and the matrix is pyroxene-dominated. The texture provides compelling evidence for igneous rocks at Gale Crater, where Curiosity is on a traverse to reach the lower slopes of Mount Sharp near the center of the crater.

## Astrogeology from page 36

### Private Eyes

The resources exist and we know where they are and they're out there waiting for earthlings to take advantage of them. And, thanks to a few visionaries, entrepreneurial adventurers and space cowboys, the private industry is just beginning to catch up with the possibilities.

"If you can characterize where we are – you know, we had Ferdinand and Isabella funding Columbus to go out and explore and discover the New World, and that's the stage where space exploration has been up to about the last five years," Cutright said.

One such modern-day Columbus would be SpaceX CEO Elon Musk, who recently made a case to the U.S. Senate Defense Appropriations Subcommittee that if they open the Air Force's Evolved Expendable Launch Vehicle (EELV) program up to more competitive bidding by the private sector, his company could save U.S. taxpayers more than \$7 billion over their current expenditures on the program since 2006.

"His testimony to Congress was that the more efficient way of launching material, equipment and sensors into space is now to use the private industry," Cutright said. "This is now a frontier that is open to private development."

Space-based communication is a more than \$4 billion-per-year industry today, but with the improvements to launch systems driven by the digital revolution, private industries are moving into turning their space investments to energy production, Cutright said.

For instance, at the 2012 ACE in Long Beach, Planetary Resources announced its plan to retrieve high-valued rare earth and platinum-group metals from near-earth asteroids for commercial use by 2022.

"They're funded by a number of very wealthy individuals that are, in essence, venture capitalists, but they made their money in the digital world," Cutright said.

He added that the growth of space-related industries averages about 15 percent a year, according to reports he's read.

"In 2012, it was a \$4 billion a year industry, so you can see where that's going," he said.

"I think there's been a big focus on near-earth asteroids and the high-valued materials that are there," Cutright continued. "I do think that's got the public's interest, and the private businesses' interest as well, but I think behind the scenes, we could easily see along the same scale solar-powered satellites and, on a little longer scale – in terms of, say, 20 years – viable energy-harnessing environments on the moon."

"The whole issue is tied around water and the ability to provide water resources on supporting that," he added, "but those same water resources are available on the near-earth asteroids, and NASA's latest study on in situ refueling, and the value of fueling stations in orbit rather on the ground, using ice resources from near-earth asteroids, shows that there's about a 40-to-1 return on investment if they can retrieve and make available ice resources in high-earth orbit."

### Leading the Way

This year's ACE astrogeology session has a specific target.

"In this session we hope to demonstrate the economics to us, the private industry majority of AAPG members, in that this is a frontier that contains valuable minerals, valuable energy resources," Ambrose said, "that it is accessible, there is competitive pricing for moving off the earth's surface and into orbit."

"And so, suddenly, all the things that we know now have much greater applicability," he added. "Yeah, there's tweaks we've got to do for a space environment, but it doesn't mean that what we know now has to be discarded. It just has to be expanded."

"AAPG, with all of the capabilities that our members have, can really be the leader in the expansion of energy resources and all necessary resources for advancing the economy into the space area." ■

# CALL FOR PAPERS

► Submission deadline:  
**30 August 2014**

<https://mc.manuscriptcentral.com/interpretation>

A joint publication of SEG and AAPG  
**Interpretation®**  
A journal of subsurface characterization



Society of Exploration  
Geophysicists  
The international society  
of applied geophysics



## Geophysical imaging and interpretation of outcrops

Outcrops have long been studied as analogs for rocks rich in natural resources, including hydrocarbons, minerals, and groundwater. Outcrops provide highly detailed information on facies assemblages, stratigraphy, textural and petrographic variability, and fracture patterns, among others. However, except in a few exceptional cases, this information is strictly two-dimensional. Geophysical tools allow for a "look behind the cliff," thus enabling 2D outcrop analog data to be extended into the third dimension. Such geophysical investigations can be operated from the cliff top, cliff face, and boreholes.

With the increasing demand for unconventional, geothermal, mineral and water resources as exploration targets there is a renewed interest in detailed outcrop studies. For this special section of Interpretation, we invite papers that focus on applying geophysical tools (e.g., seismic, ground-penetrating radar, and downhole geophysical logging) for imaging and interpretation of outcrops. We also invite papers that use Lidar and high-resolution outcrop imagery in combination with behind-the-cliff geophysical data or synthetics.

The focus of the work can be on geophysical imaging and modeling, 3D facies analysis and sequence stratigraphy, studies of deformation and faulting, mineralization, fracture zones, and generating high-resolution input for geological modeling of both sedimentary and crystalline systems. Case studies for specific outcrop analogs are also welcomed.



Image courtesy of M. Pipan

Interpretation, copublished by SEG and AAPG, aims to advance the practice of subsurface interpretation.

The submissions will be processed according to the following timeline:

Submission deadline:  
**30 August 2014**

Publication of issue:  
**May 2015**

### Special section editors:

**Remke L. Van Dam**  
rld@msu.edu

**Aria Abubakar**  
aabubakar@slb.com

**Emanuele Forte**  
eforte@univ.trieste.it

**Jeroen A.M. Kenter**  
kenter.jeroen@gmail.com

**Alireza Malehmir**  
Alireza.Malehmir@geo.uu.se

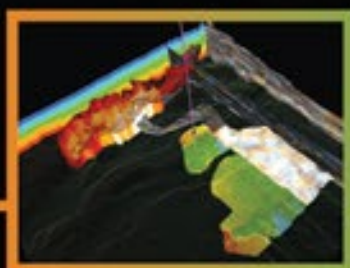
**Michele Pipan**  
pipan@units.it

**Gerard T. Schuster**  
gerard.schuster@kaust.edu.sa

**Joep E.A. Storms**  
J.E.A.Storms@tudelft.nl



**Here for the  
proof seekers,  
problem-solvers  
and forward  
thinkers.**



**GeoTeric® is on hand with Geological Expression software,  
services and support centred around you.**

Whether your focus is on achieving a detailed interpretation – or hitting deadlines –  
we're here to provide a better experience for everyone involved in seismic interpretation.

Delivered by Geological Expression specialists, with a track record that spans over  
300 successful projects in conventional and unconventional reservoirs, you'll find  
we're on your side and at your service.

[poweron@GeoTeric.com](mailto:poweron@GeoTeric.com)

**poweron** with GeoTeric







# GeoMark. Rocks. Everywhere.

## International Source Rock Database

Better decisions begin with rock solid information. The GeoMark Rock and Fluid Database is a critical first step to new reserves. Explore this dynamic database that combines source rock, oil, gas and PVT data to quickly drill down to the information you need. GeoMark is your source for geochemical lab services, regional studies and databases. Visit our website for information and a database demo at [www.geomarkresearch.com](http://www.geomarkresearch.com).

# GEOMARK

*Consider The Source*

9748 Whithorn Drive • Houston, Texas 77095 • 281.856.9333 • [www.geomarkresearch.com](http://www.geomarkresearch.com)



*Photos courtesy of Art Donovan.*

Site of the BP/SLB Lozier Canyon research well: Austin is at top, Buda at the base and Eagle Ford in between; to the eye, black lower half is lower Eagle Ford and lighter colored upper half (bedded and burrowed) is the upper Eagle Ford.

## A trip to bountiful

# Eagle Ford Gets Spotlight

By BARRY FRIEDMAN, EXPLORER Correspondent

If you want to know about the Eagle Ford play in Texas, AAPG member Art Donovan is a man you want to be talking to.

And if you want to actually take a trip to study the Eagle Ford, Donovan probably is THE man you want to be talking to.

And the numbers of geoscientists in both those groups have been growing over the past few years, because exploration in and around Eagle Ford in Texas, which Donovan is expertly familiar, has been a huge success story – and “huge” may be an understatement.

Since 2008, in fact, it has become one of the most heavily drilled targets in the United States with more than 7,000 wells having been drilled – and another 5,500 having been approved by state regulators for future exploration.

And Donovan, a professor at the Department of Geology and Geophysics at Texas A&M University who will be leading a field trip to the area as part of this year’s AAPG Annual Convention and Exhibition in April, is not surprised.

“The Eagle Ford is a great source rock,” he said.

“In the onshore U.S., we have pretty much gone through the better conventional reservoirs and what’s left are unconventional things like tight gas, tight oil, shale gas and shale oil,” he added.

Unlike the Bakken play in North Dakota, however, Eagle Ford’s success is pretty unique, according to Donovan, who is BP’s senior geoscience adviser for unconventional reserves.

“Due to local overpressure in the oil window, it’s probably the only successful shale oil play in the U.S.,” he said. “The Bakken in North Dakota and most of what’s happening in Permian Basin in west Texas is really a tight oil play.”

There are other factors, Donovan said, for an area to be such a vibrant, successful play, and Eagle Ford has all of those going for it.

“It has full product spectrum of product type, from volatile oil to dry gas,” he said, comparing it with the Haynesville, which is mainly a dry shale gas play.

Also, it’s an excellent source rock that in south Texas is carbonate-rich and clay poor, which gives it the proper mechanical stratigraphy to be a great unconventional shale oil to shale gas reservoir.

“It also has regions of overpressure,” he added, “that allow the shale oil window to actually work.”

### Up Close and Personal

Much of this region will be on display during the field trip that Donovan, along with AAPG members Scott Staerker, Rand Gardner, Aris Pramudito and Jonathan Evenick, will be leading.

All concerned have worked the Eagle Ford, as well as other unconventional mudstone plays in the subsurface of North America, and bring with them a wealth of multi-discipline expertise, knowledge and experience to the subject of unconventional mudstone reservoirs and the area.

“It will be,” Donovan said, “an opportunity for folks to examine the entire Eagle Ford succession in spectacular outcrops within Lozier Canyon.”

Interestingly, the outcrops are on private property and had been off limits to over a generation. According to Donovan, not until BP’s geologists in its land department gained access rights in 2010 were research and field trips even available.

“Since 2010, BP has funded research to graduate students to better understand the Eagle Ford within Lozier Canyon,” he said.

For ACE attendees, that means a chance to see the area, literally, up close and personal.

“With this framework in place, folks can walk up to and examine the exact portions of the Eagle Ford, underlying Buda, and overlying Austin in outcrop, that is of interest to them in the surface,” Donovan said.

Field trips like these at conferences are always part fun, part educational. In this case, the trip aims to clearly demonstrate, explain, and predict the Eagle Ford outcrops and unconventional reservoirs, while also increasing discussion on the geologic, engineering, petrophysical, geochemical, geophysical and drilling challenges associated with exploring and exploiting oil and gas resources from the Eagle Ford, as well as other unconventional mudstone reservoirs.

This trip, Ford says, will be an opportunity to display the research efforts of those graduate students.

“I should also note the work we have done has allowed us to port the subsurface Eagle Ford stratigraphy directly into the outcrops,” he said, while adding, “basically, we don’t get bogged down in local terminology and provincial stratigraphic usage.” ■



DONOVAN





# THE EARTH SINGS

Global Microseismic Services' **Ambient InSight™** offering uses the incredible sensitivity of the TFI™ method to map fractures prior to drilling or completion of wells. This technique uses seismic emissions (Ambient Microseismic™) caused by naturally occurring stress and pressure variations associated with earth tides and tectonic activity to directly map fracture networks. Unlike the monotonous drumbeat of traditional proxy hypocenters, TFIs use the complete spectrum of microseismic emissions, resulting in images that resound with the fullness of a symphony orchestra.

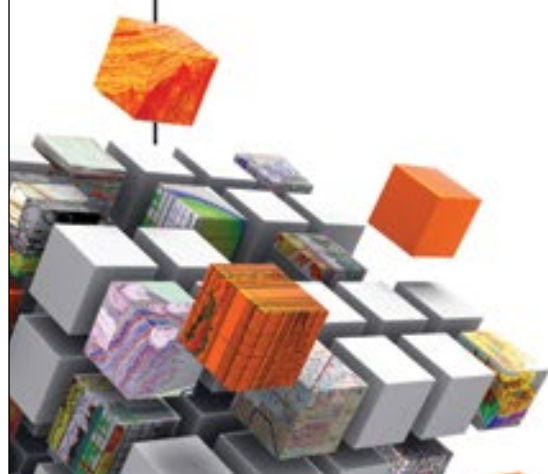
And thanks to the 32-bit technology in our AutoSeis® High Definition Recorder, we can capture the faintest passages of the earth's song, providing our clients with incredibly detailed images of the fracture networks in their reservoir.

## Global Listens

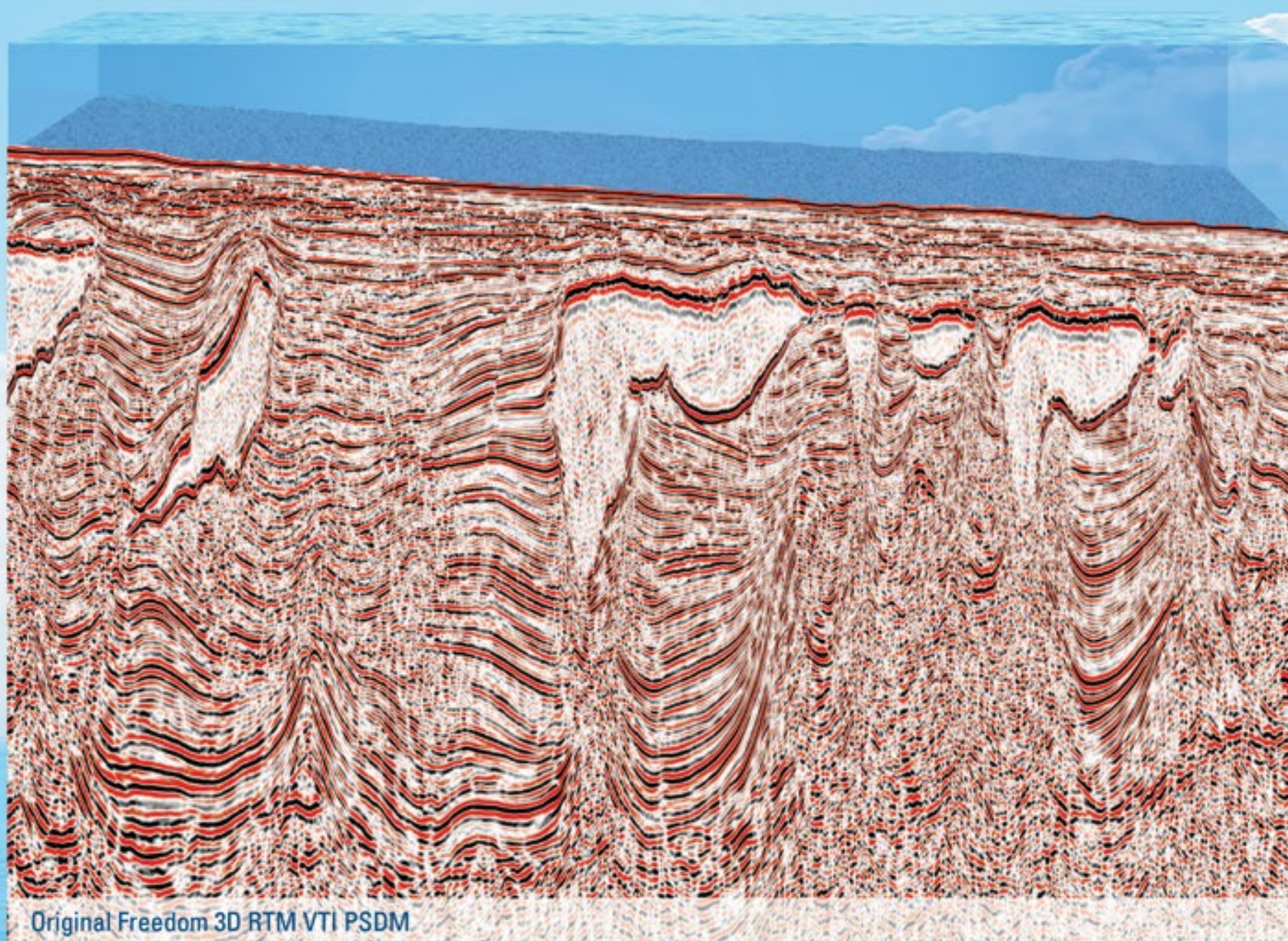
Global Microseismic Services®

**GAIN** *InSight*

Global Microseismic Services, Inc.  
a Global Geophysical Services Company  
13927 S. Gessner Road • Missouri City, TX 77489  
tel +1 713-972-9200 [www.globalgeophysical.com](http://www.globalgeophysical.com)







## SEE THE UPLIFT

**3D M-WAZ TTI data now available in Central Gulf of Mexico**

TGS gives you a clearer view of the geologically complex structure in the prolific Mississippi Canyon region of the Gulf of Mexico with Freedom TTI 3D WAZ. Significant improvement in data quality over the earlier PSDM has been achieved through the use of Tilted Transverse Isotropy (TTI) RTM pre-stack depth migration.

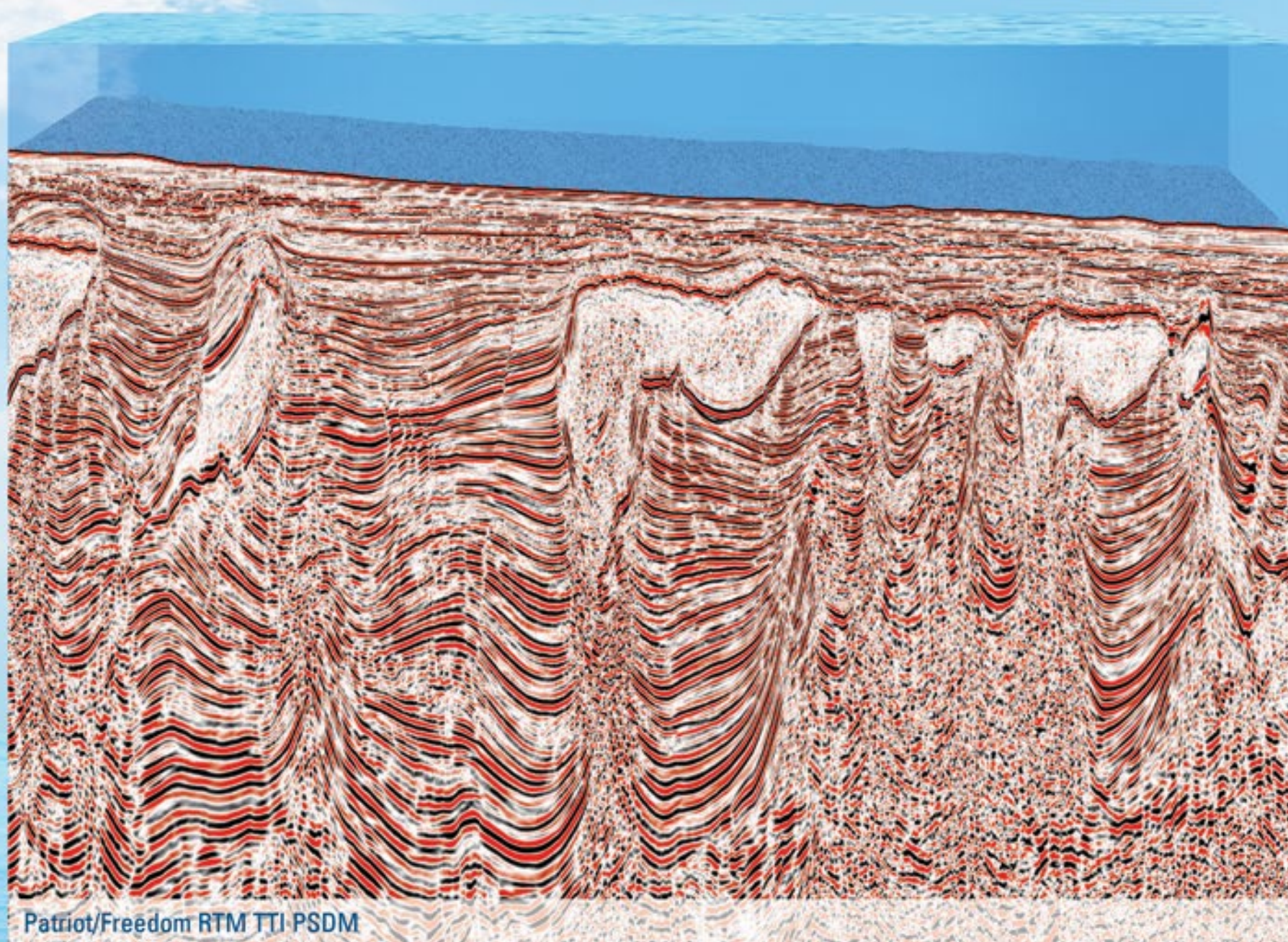
Patriot M-WAZ Project Includes:

- Patriot 3D WAZ RTM TTI PSDM
- Patriot 3D WAZ CFP RTM TTI PSDM
- Freedom 3D WAZ RTM TTI PSDM
- Patriot 3D WAZ CFP KIR TTI PSDM

See the energy at [TGS.com](http://TGS.com)

© 2014 TGS-NOPEC GEOPHYSICAL COMPANY ASA. ALL RIGHTS RESERVED.





For more information, contact TGS at:  
Tel: +1 713 860 2100  
Email: [info@tgs.com](mailto:info@tgs.com)





*Rose receives Halbouty Leadership Award*

## Risky Business: A Career of Taking Chances

By BRIAN ERVIN, EXPLORER Assistant Managing Editor

**P**ete Rose appreciates the affirmation that comes with being the 2014 recipient of AAPG's Michel T. Halbouty Outstanding Leadership Award.

He takes the honor seriously and he clearly values the validation of his peers, but he has a casual approach to the recognition that suggests, perhaps, he isn't particularly surprised to be getting it.

Rose, a past president and an Honorary member of AAPG, is now the retired founder and president of Rose & Associates, a globally recognized E&P risk assessment firm based in Houston.

But that's only part of his story.

He has a litany of other accomplishments and accolades to his name from his long career in geology: He's been an author, an activist, a teacher and the head of the oil and gas branch of the U.S. Geological Survey, as well as a recipient of other prestigious industry awards.

For AAPG he's been president of the Association (2005-06), chair of the Advisory Council, a member of at least 10 committees (serving as chair of three), president and Life Member of the DPA, president of the Gulf Coast Association of Geological Societies, a charter member of both the EMD and DEG, winner of the AAPG Distinguished Service Award, Distinguished Lecturer and columnist of the EXPLORER's popular "Business Side of Geology" series.

And that's just *some* of his experiences.

Yet he cited none of these distinctions when he spoke of the honor to be bestowed



Honorary member and past AAPG president Pete Rose through the years: He always had an eye toward leadership.

upon him at AAPG's upcoming Annual Convention and Exhibition in Houston this month.

"I'm an old guy – I've been a geologist for 55 years," Rose said. "So, you live that long and work in a profession all that time, you're bound to do a few things right."

### First Steps

His self-deprecation, however, belies a storied and carefully considered career

punctuated by thoughtful risks and self-imposed challenges – as well as by successes and setbacks that tested and refined his character and professional resolve.

The seeds of that career were planted at a young age when he met a counselor at Boy Scout camp by the name of Art Owen, who was a geology student at the University of Texas.

"He was a terrific counselor, and he got me into rocks and minerals and fossils and

things," Rose related. "From the time I was 14, I haven't really thought of doing anything else."

Rose said he didn't quite grasp at the younger age what geologists did yet; he was taken more by his newfound interest in fossils and minerals than any consideration of commercial application.

"But it was a close enough connection that it sustained my interest until I could

[See Rose, page 46](#)

Under the Auspices of the Ministry of Energy & Water Republic of Lebanon

## 2014 LIPE & AAPG Northern Arabia Geoscience Conference and Exhibition

### New Frontiers, New Challenges

27 – 29 May 2014

Hilton Beirut Habtoor Grand, Beirut, Lebanon

REGISTRATION

FIELD TRIP

SPONSORSHIP PACKAGES

TECHNICAL PROGRAM

SHORT COURSES

EXHIBITION OPPORTUNITIES

Visit our website for more information  
[middleeast.aapg.org/LIPE](http://middleeast.aapg.org/LIPE)



AAPG







أرامكو السعودية  
Saudi Aramco

9:25AM

CAPITALIZING ON A VAST,  
HYDROCARBON-RICH ENVIRONMENT

5:25PM

CAPITALIZING ON SOME DOWNTIME  
ON CALM, BLUE WATERS

## GEOSCIENCE PROFESSIONALS

Join a multidisciplinary team of experienced professionals evaluating conventional and unconventional resources in Exploration at Saudi Aramco. Take the opportunity to develop frontier source rock and tight reservoir basins among the largest oil and gas fields in the world. Employ advanced seismic processing techniques, including 3D visualization and remote geosteering of multilateral wells, to drill and produce prospects in subsalt plays. Utilize cutting-edge technology to identify and manage reserves in a diverse environment. Beyond work, enjoy a flexible schedule that offers a chance to explore the wealth of activities in Saudi Arabia. Advance your career while experiencing a work-life balance. Saudi Aramco provides a chance to do it all.

Visit us at AAPG Conference & Exhibition, Booth #1528.

Visit us at OTC, Booth #5621.

**DREAM BIG** at [www.Aramco.Jobs/EX](http://www.Aramco.Jobs/EX)





Rose as president of AAPG, with his fellow Executive Committee members: (clockwise, upper left) Ernie Mancini, Don Clarke, Clint Moore, Mike Party, Steve Veal and Lee Billingsley.

## Rose from page 44

begin to identify all of the other stuff that geologists do," he said. "So, I really haven't wavered from that primary interest."

### The Shell Game

Along with the lasting impression left upon him by his Boy Scout counselor, Rose credits the influence of other role models from early in his career when he worked for Shell Oil Company.

"Shell had a wonderful tradition of keeping capable senior people around, and one of their primary functions was to mentor younger geologists coming up – and I sure did benefit from that," he said. "A guy named Baxter Adams was an early role

model. Baxter and I are still friends. I worked for a guy in Corpus Christi named Ted Cook, who is now deceased, rest his soul. He was a tremendous role model. And I went to Shell in Denver and I worked for a guy named Jim Clement (also departed), who was also a really super guy."

As grateful as Rose was for the guidance he received, he grew to understand that there were some lessons and experiences he could only find by setting out on his own, out from under the protective wings of his mentors.

"I guess Shell kind of wanted to keep me in the research and science side of everything, but I felt like I needed to move into the application and management side," he said. "That was a challenge, making that move, and I finally had to leave Shell to make that move, to get out into a leadership or management area."

"I never lost the scientific interest," he said, "but I sort of augmented it with the leadership and management kind of stuff."

### Managing His Career

It was a risk to leave a stable, secure and successful job with one of the biggest oil companies in the world, and it didn't come without cost, but Rose is glad he took it, and advises others to take similar chances:

"I've always felt like your career is not something that just happened to you on your way to retirement, but it was a part of your life you would do well to manage – to think about and manage. And I've certainly tried to manage mine," he said.

"Your career is – granted, not totally within your control – but it certainly is within your ability to guide it if you're willing take risks and make a move here and there," he said. "You've got to decide – consistent with the state you're at in your career – you've got to decide what you need to be doing to put yourself in a position to be able to do that."

"There's an old adage I think is pretty good: 'I was looking for a job when I took this job, and I can always go look for another one,'" he continued. "If you're a scientific or technical person working for a company, there are obligations on both sides of that bargain. The company has every right to expect you to be diligent in your application of your efforts, to work hard and give total devotion to your company. And you have a right to expect to be paid a reasonable amount and to be given an opportunity to grow."

"If either party feels over a reasonable period of time that those obligations aren't being met," he said, "then the relationship should end."

### From Broke to the Big Break

In 1980, after he left Shell, he established his own independent oil and gas consulting firm, Telegraph Exploration Inc.

As Rose explained, the company initially thrived, with a client list that included most major U.S. companies and several prominent independents, as well as many international firms and state oil companies.

It wasn't to last, however.

"We had about two good years and then things started going south," Rose said. "I hit bottom in 1986 when the price of oil dropped. I came pretty close to going broke at about that time, but I managed to survive."

"That was a challenge getting through that period," he said, "but a lot of geologists had to deal with the same challenges and still struggled through."

Eventually, he went on to form Rose & Associates in 1998.

See Leadership, page 54

## The GeoCare Benefits Group Life Insurance Plans. Affordable Benefits, Exceptional Service, All Focused on Your Family's Financial Security and Your Peace of Mind.

GeoCare Benefits Offers You Three Quality Group Life Insurance Plans to Choose From. Our Term Life Insurance Plan provides the type of coverage often recommended by financial professionals, at an affordable group rate. The 10-Year Level Term Life Insurance Plan offers the same type of insurance, but keeps rates steady for each 10-year period. Finally, the First-to-Die Life Insurance Plan also offers term life benefits, covering member and spouse for the same amount of protection, but pays the benefit on the first spouse to die. No matter which Plan you choose, you'll benefit from our affordable group rates, flexible payment options and our commitment to providing you with exceptional service. Plus, you'll have the peace of mind that comes from knowing all three plans have been researched, approved and endorsed by AAPG's Committee on Group Insurance.



We've Done the Work For You...Choose From Three Life Insurance Plans to Help Protect Your Family's Future, and Your Peace of Mind. Call 1-800-337-3140 or Visit Us on the Web at [www.geocarebenefits.com](http://www.geocarebenefits.com) For More Information, Including Eligibility and Renewal Provisions, Exclusions, Limitations and Rates.

GeoCare Benefits Life Insurance Plans, P.O. Box 9159, Phoenix, AZ 85068-9159, Email: [geocarebenefits@agia.com](mailto:geocarebenefits@agia.com). The Group Plans—Term Life, 10-Year Level Term Life, and First-to-Die Term Life Insurance Plans are underwritten by New York Life Insurance Company, 51 Madison Ave., New York, NY 10010 under Group Policy GMR/G29067/G29195/FACE. All coverage is subject to approval by New York Life Insurance Company.



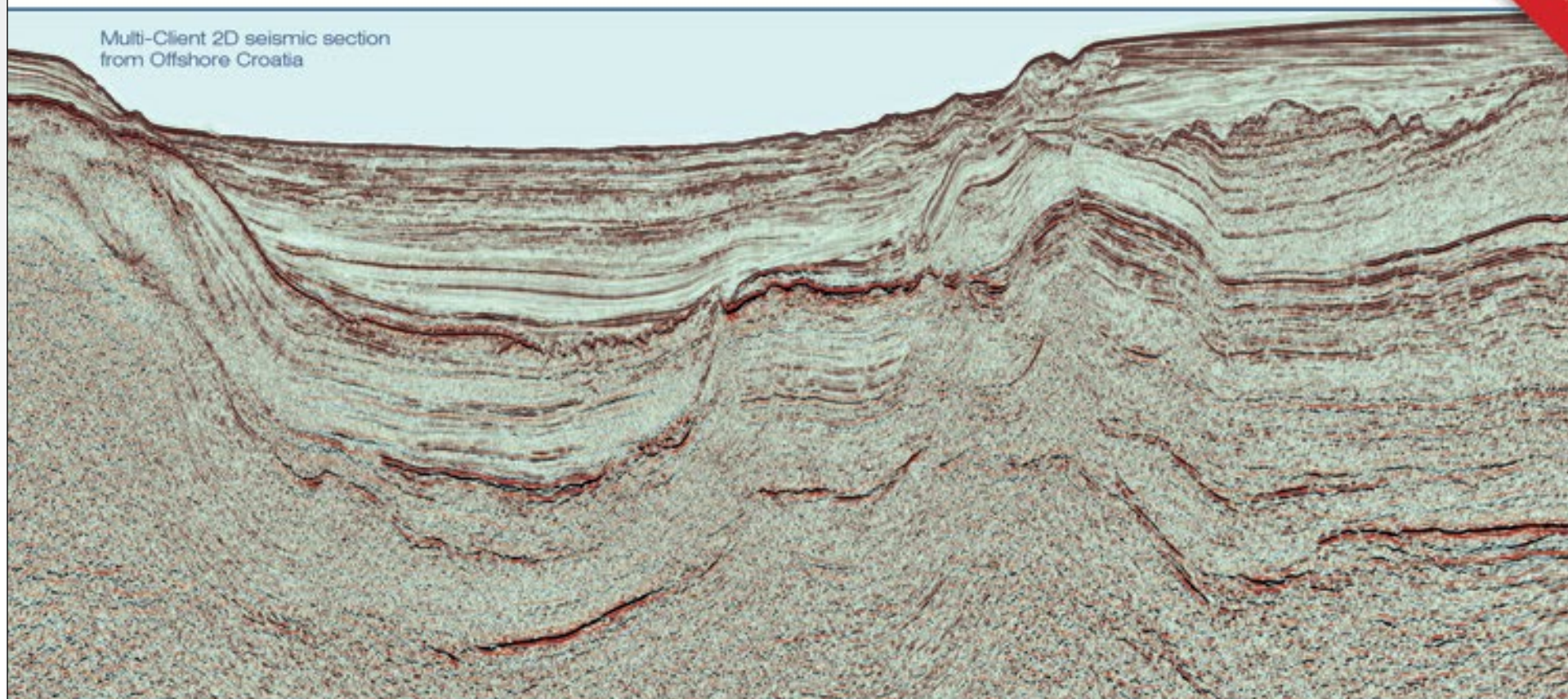


# Offshore Croatia

## A New Oil Province at the Heart of Europe

visit us at the  
**AAPG**  
Annual convention  
booth #545  
and AAPG International Pavilion #748

Multi-Client 2D seismic section  
from Offshore Croatia



Spectrum has acquired a truly unique Multi-Client seismic survey offshore Croatia. This is the only seismic data available to license in this hugely underexplored region which expects to see its first offshore licensing round this year.

The survey, acquired under contract to the Ministry of the Economy in Croatia, covers approximately 14,700 kilometres of long offset seismic data with a 5 km x 5 km grid. It extends across most of the Croatian Adriatic Sea and connects with Spectrum's reprocessed seismic data covering the Italian Adriatic Sea.

Final PSTM data has now been delivered and all processed data will be available in early April. The Government of Croatia plans to hold a licensing round over the country's offshore continental shelf in 2014.



+44 (0)1483 730201  
@mc-uk@spectrumasa.com  
www.spectrumasa.com



Robert R. Berg Outstanding Research Award 2014

## The Man Who Wrote the Book on Field Safety

By BARRY FRIEDMAN, EXPLORER Correspondent

It didn't start out to be a bible.

"At ExxonMobil, we have a very good Operational Integrity Management System (in place since the late 1980s) that addresses almost every aspect of what we do as a corporation, from shooting seismic and drilling wells to running refineries, in a very systematic approach across the corporation."

That's AAPG member Kevin M. Bohacs, one of the winners of this year's Robert R. Berg Outstanding Research Award, in part for his work in developing concepts that have literally trained thousands of geologists around the world through his lectures, workshops, symposiums and, mostly, through his field manual "Field Safety in Uncontrolled Environments – A Process-Based Guidebook."

Bohacs, a senior research scientist with ExxonMobil Upstream Research Co., laughs when told his work, for many, like Ron Boyd, of NGU (Geological Survey of Norway), is the bible in the field, for he readily admits he didn't re-invent the wheel.

In fact, Bohacs, who also is known for his groundbreaking work in detailed stratigraphic and sedimentology characterization of mudstones, says modestly his motivation in writing it was not so much that there was a lack of safety at ExxonMobil (far from it) – or the industry. Just a lack of uniformity.

"Our field activities at the time were handled more on a company-by-



A man of research, and a career of adventure: Kevin Bohacs brings global experience to his work as a geoscientist.

company basis," he says, "and although all were conducted safely, there were significant differences in processes and communications of requirements."

And that's how the field safety book came to be.

"We saw an opportunity to share field safety lessons across the corporation," Bohacs said, "and to standardize and streamline the process."

### Getting Organized

What Bohacs and his co-author, Stephen R. Oliveri, did was devise a uniform field safety process that took a systematic approach to preparation, execution and learning for the next time – company wide, based on input from most of their experienced field instructors and workers.

"It wasn't so much developing new

material," he emphasized, "as it was organizing, updating and streamlining what we had already been doing for more than 40 years."

And that's when it got interesting. "We documented this in a handbook for internal use at the company and

Continued on next page

## UPCOMING 2014 EVENTS \*SAVE 15% USE CODES BELOW WHEN YOU REGISTER IN APRIL



### EMERGING SHALE PLAYS USA 2014

First Mover Shale Plays. Early Development Plays. Plays On The Brink Of Commerciality

May 28-29, 2014 | Houston | Texas

Providing Updated Core Analysis Data And Production Results To Identify Key

Geochemical, Petrophysical And Structural Production Drivers In The Hottest Emerging US Shale Plays

And Quantify Initial Rates Of Return, Identify Sweet Spots And Infer The Profitability Of Each Play Presented

Hear From Leading New Ventures Explorationists Including:



Todd Dutton  
President  
Longfellow  
Energy



Kirk Barrell  
President  
Amelia  
Resources



Cory Christofferson  
SVP Reservoir &  
Production Engineering  
Goodrich Petroleum



Thomas Bowman  
VP Evaluation, Geology  
& Geophysics  
ZaZa Energy

Quote 'AAPGEPNA' For Discount

[www.emerging-shale-plays-usa-2014.com](http://www.emerging-shale-plays-usa-2014.com)



### TIGHT OIL RESERVOIRS CALIFORNIA 2014

Optimizing Crude Production In California's Heterogenous Unconventional Reservoirs

June 25-26, 2014 | Bakersfield | California

Identify Productive Zones And Determining The Most Appropriate Stimulation And Production Techniques For California's Shale And Unconventional Tight Reservoirs:

Hydraulic Fracturing, Steam Injection And Acidization

Hear From Over 20 Expert E&P & Regulatory Speakers Including:



Bob Paole  
Public & Government  
Affairs Manager  
Santa Maria



Lorelai Oviatt  
Director  
Kern County  
Planning



Mark Wilson  
Geology Manager  
Santa Maria



Paul Gagnon  
SVP  
Central Resources

Quote 'AAPGMNT' For Discount

[www.tight-oil-monterey-california-2014.com](http://www.tight-oil-monterey-california-2014.com)



### BAKKEN & THREE FORKS COMPLETIONS & WELL SPACING 2014

The Only Completions And Reservoir Engineering Focused Bakken Congress

May 28-29, 2014 | Denver | Colorado

Technical Insight From 20+ Bakken & Three Forks E&P Professionals:



Chris Wright  
CEO  
Liberty Resources



David Veltri  
COO  
Emerald Oil



Dominic Spencer  
EYP  
Triangle Petroleum Corporation

Quote 'AAPGBCG' For Discount

[www.bakken-completions-2014.com](http://www.bakken-completions-2014.com)



### HORIZONTAL COMPLETIONS OPTIMIZATION WESTERN CANADA 2014

Reservoir Specific Completions Techniques For The WCSB

June 24-25, 2014 | Calgary | Canada

Expert Insight From Over 20 E&P Completions Industry Professionals Including:



Jean-Yves Chabellier  
Technical Lead  
Talisman Energy



Paul MacKay  
President  
Shale Petroleum



Doug Berlinger  
Geology Advisor - Shale Gas  
Nexen

Quote 'AAPGCC' For Discount

[www.horizontal-completions-canada-2014.com](http://www.horizontal-completions-canada-2014.com)





*Geoscience without borders: Bohacs research and humanitarian approach to his work gave him plenty of opportunities to interact with the locals in Madagascar – and vice versa.*

### Continued from previous page

started teaching the process to our affiliate companies around the world.”

The world liked what it was reading, so Bohacs had an idea.

“I suggested that we publish our handbook, so other organizations could see where we were coming from and encourage an equivalent systematic approach.”

It worked.

“Our vice president at the time, Carlos Dengo (AAPG member), convinced AAPG to publish it (it didn’t take much persuasion), and the rest is, um, history.”

### Taking It to the Streets

It became clear almost immediately that what benefited ExxonMobil would soon benefit others.

“We needed this handbook because there was really no other publication available that addressed, in a systematic and scalable process, the wide range of field activities that we conduct,” he said. “Our activities run the gamut from walking on paved trails at national parks to diving on reefs and camping in very remote areas.”

As an advanced first aid/CPR instructor trainer for the American Red Cross since the early 1970s, Bohacs clearly understands not only the importance of safety, but the importance of training those involved in delivering that safety.

“There are indeed several very good books on safety in the field, but they tend to concentrate more on detailed tactics, prescriptive do’s and don’ts for specific settings or activities (such as mountain climbing, diving or backcountry trekking),” he said. “We took a more strategic approach, basing the book on our process – of thinking about what hazards one faces, preparing for the field based on those hazards and risks, conducting field activities in light of those risks and documenting what one learns to be used the next time.”

Industry-wide, Bohacs said he is relatively happy with the focus on safety, even if that focus is somewhat against the grain.

“It is true that there was a certain ‘cowboy’ mentality that many of us experienced in our early field activities that continues to some degree to this day,” he

said, “but there is a widespread realization that to maintain our access to field sites and garner support to conduct the essential training activities in the field, we all need to be safe.”

### Think About It

So, how successful is the book?

Bohacs said it’s not just a sense that it’s working – he’s got data.

“The charm of our system at ExxonMobil is that we document every aspect of our field activities and can show exactly how and how often participants are injured,” he said.

“Over the last 10 years of running the system, we have more than one million work hours of experience that we share with the short course participants,” he continued, “statistics that show, in any given year, it can be two to four times safer to be in the field than in a typical office (based on injuries reported to OSHA).”

Bohacs, who said a new edition is in the works, is honored to be receiving the Berg award, adding it is especially gratifying because of the value the AAPG community places on the role of research in developing technology to make our search for resources more effective, efficient and environmentally sound.

Something else, too: He meets people affected by his work – and by his book.

“My favorite reaction to the guidebook and process was based on how we teach the short course, where we make the participants really think about what could happen on the trips they lead (during the classroom day), and then subject them to dealing with many common issues (during the field day of the course),” he said.

“I saw this particular participant on the Monday morning following the short course (on Thursday and Friday), and asked him how was his weekend.

“‘Terrible,’ he said. ‘I’ve been leading field trips for 17 years and I hadn’t thought about half the stuff you brought up in class – stuff that almost happened or that I could very easily see could have happened. I lost a lot of sleep ...’

“I was sorry that he had a terrible weekend,” Bohacs said, “but glad that he got it.”



**EXPLORATION HAS NEVER BEEN MORE SEAMLESS**

**GEOFACETS**  
from ELSEVIER

Geofacets enables seamless search and integration of georeferenced geological maps sourced from Elsevier and other trusted scientific providers.

Locate relevant peer-reviewed maps using specialized geographic and text-based search features

Download map images and georeferenced maps for easy integration into GIS, modeling, and presentation tools



**LEARN MORE TODAY AT  
ELSEVIER.COM/GEOFACETS**

Copyright © Elsevier Inc. All rights reserved.



## Norman H. Foster Outstanding Explorer Award 2014

# Different Puzzles, Same Pieces, Great Results

By LOUISE S. DURHAM, EXPLORER Correspondent

Each year, a uniquely talented and successful explorationist is selected to receive the Norman H. Foster Outstanding Explorer Award from AAPG.

The award is presented to an AAPG member "... in recognition of distinguished and outstanding achievement in exploration for petroleum or mineral resources, by members who have shown a consistent pattern of exploratory success, and with an intended emphasis on recent discovery."

That's a perfect description of this year's winner, Orion Skinner, senior explorationist at Whiting Petroleum Corp. since 2004.

If his name sounds familiar, it should.

Skinner has been a major force in a number of successful discoveries during his 31-year stint as a petroleum geologist.

The crown jewel among these finds is the notable Pronghorn Field in North Dakota, where Whiting drilled the discovery well in 2010.

"I probably would say that Pronghorn is a career high point because of all the disciplines, all the subtle hints that had to be



SKINNER

teased out of the data that lead to that," Skinner said. "It really was a culmination of using all the skills, all the tool boxes to find that area."

"So I think out of all the discovery areas I've been in, if there was one that I felt was probably one of the neater ones as far as just from concept to how it was found, this was it," he said. "Definitely."

The highly productive Pronghorn zone lies beneath the lower Bakken shale and overlies the Three Forks Formation in the

Williston Basin. The main Pronghorn pay facies is burrowed detrital dolomitic siltstone with finer-grained rippled interbeds.

"The play is not at all a look-alike of any other Bakken systems accumulations, so to some extent it's a first principles discovery, other than we're operating within the petroleum system of the Bakken shales," Skinner emphasized.

He is quick to credit the influence and contributions of his co-workers relative to Whiting's Williston Basin successes as well as the backing of the company's management team.

### A 'Natural Curiosity'

This super talented explorationist hails from Pinedale, Wyo., where his family ran an outdoor wilderness school for kids, so the outdoor life has long been intriguing to Skinner and his entire family.

"As kids, we would all go out in the middle of nowhere looking for rocks and things," he said. "I got into the intrigue of picking up cool rocks, wondering what this is."

"I was in the outdoors a lot, seeing a lot of neat stuff and trying to understand how it came about."

Now joined by his wife and children, this early family tradition of exploring the great outdoors continues today.

Rock climbing was another of Skinner's early interests, and he was a member of the Wyoming Centennial Everest Expedition aka "Cowboys on Everest" in 1998. In a challenge of man versus altitude, the latter ruled, and he was forced to retreat after reaching an elevation of 26,000 feet.

Skinner earned both a bachelor's and master's degrees in geology at the University of Wyoming.

He almost lost his way, he likes to joke, initially venturing into petroleum engineering. It wasn't until his junior year in college that he enrolled in his first geology class.

"I thought petroleum handled the rock side but found out otherwise," he noted. "I tell my engineering folks that I saw the light and shifted from the dark side."

His take on the process of hydrocarbon exploration is enlightening.

"This whole business of exploration is like a 1,000-piece puzzle with 15 pieces, and you don't know what the picture is," he said. "The challenge always is you use the same tools, but it's never the same."

"Different plays and different areas, you still have the same basic toolbox, but it's always fresh and new because no areas are exactly the same."

"That's one of the reasons I'm always looking beyond my project area," he noted, trying to map the next county, state, whatever, because of my natural curiosity about what's going on."

### Home Sweet Home

Skinner is one of those exceptional oil and gas industry individuals who has spent his entire career at one base camp, so to speak.

"It's rare that anyone stays in one place this long, but I've been in Denver since 1982 except for one summer stint down in Lafayette, Louisiana," he said. "I keep saying I've had enough Gulf Coast experience now, so I don't have to go south."

"Being a Wyoming boy," he said, "I need winters – I need seasons." ■

# CALL FOR PAPERS

► Submission deadline:  
**1 September 2014**

<https://mc.manuscriptcentral.com/interpretation>



## Mining geophysics

Mining geophysical methods and technologies have recently discovered or rapidly advanced a number of significant mineral deposits. Case histories and advances have been presented at professional conferences, but most have not been published in a scientific journal such as Interpretation.

Special-section editors encourage complete geophysical case histories and successes. Manuscripts that provide geologic reasoning for the geophysical surveys, the role of prior "legacy" data, and the interpretation methodology of the geophysical data with supporting field data examples are preferred.

Contributions may include the following:

- detailed interpretation case histories;
- new technologies or methodology and interpretation techniques used to overcome particular geologic challenges;
- mineral exploration concepts from the viewpoint of a geophysicist.



Image courtesy of Lamontagne Geophysics

Interpretation, copublished by SEG and AAPG, aims to advance the practice of subsurface interpretation.

The submissions will be processed according to the following timeline:

Submission deadline:  
**1 September 2014**

Publication of issue:  
**May 2015**

Special section editors:

**Bob Lo**  
[bob.lo.yyz@gmail.com](mailto:bob.lo.yyz@gmail.com)

**Mark Shore**  
[mshore@magmageosciences.ca](mailto:mshore@magmageosciences.ca)

**José Arce**  
[josearce@geofisicos.com](mailto:josearce@geofisicos.com)

**Tom Lane**  
[tom.lane@sympatico.ca](mailto:tom.lane@sympatico.ca)

**Richard Smith**  
[rsmith@laurentian.ca](mailto:rsmith@laurentian.ca)

**Yaoguo Li**  
[ygli@mines.edu](mailto:ygli@mines.edu)





HGS-PESGB

PES <sup>1964 | 2014</sup> 50 GB

13th Conference on African E&P

# Africa: A World of Opportunities

September 9–10, 2014

The Westin Houston, Memorial City, 945 Gessner Road, Houston, Texas

## Call for Papers, Posters, Sponsors and Exhibitors

In twelve years this conference has become established as a leading technical E&P forum on Africa, with attendance that can exceed 400. Participants include operators, service companies, consultants, governments and academia. The two day program of talks, technical posters and vendors' exhibits will be held on September 9-10, 2014 in Houston, Texas.

The conference, which alternates annually between London and Houston, is organized by the Houston Geological Society (HGS) and Petroleum Exploration Society of Great Britain (PESGB). The HGS-PESGB African Conference covers all aspects of African E&P, with particular emphasis on new ideas for plays and prospects, the geology of the continent and its conjugate margins, and application of emerging technologies.

Abstracts (~200 words) should be submitted as soon as possible to the technical committee, [Africa2014@hgs.org](mailto:Africa2014@hgs.org). The program will be finalized by the end of April.

Currently, volunteers are being sought to be proactive Session Chairs and anyone interested should contact the Technical Committee as soon as possible.

Details of sponsorship opportunities and display booths are available from the HGS office. To become a sponsor or inquire about exhibit space, contact [sandra@hgs.org](mailto:sandra@hgs.org)

Registration will be available from April 2014 and Early Bird benefits will apply for a few weeks.

Further details will appear in the HGS and PESGB bulletins and on their websites, [www.hgs.org](http://www.hgs.org) and [www.pesgb.org.uk](http://www.pesgb.org.uk).

### Conference Committee for 2014

Martin Cassidy (chair), Al Danforth, Ian Poyntz, Donna Davis and Sandra Babcock (HGS)  
Ray Bate and Duncan Macgregor (PESGB).





## Early-bird Registration

Sign up early and save \$100!

**Rocky Mountain Section—AAPG  
Annual Meeting**

July 20-22, 2014 in Denver, CO

Visit [www.aapgrms.org/2014](http://www.aapgrms.org/2014) to register!

*Opens mid-April*

**Promote your visibility in the geoscience community by  
being a Sponsor and/or an Exhibitor!**

**The RMS-AAPG annual meeting attracts hundreds of  
attendees. It's a simple way to gain name recognition  
and to network with potential clients, partners, and  
employees.**

**The RMS-AAPG Annual Meeting is expected to include:**

- Two days of technical presentations
- Three short courses
- Four field trips
- Two different core sessions
- Teacher's Program
- All-Convention Luncheon: "Colorado's Extraordinary Flooding in 2013" by Robert Jarrett, Ph.D.
- Social and Networking Events
- AND MORE!

For more information, visit:  
[www.aapgrms.org/2014](http://www.aapgrms.org/2014)

Thanks to Idaho Association of Professional Geologists and Montana Geological Society for their ad space donation!

# Berg Outstanding Research Award Loucks: Science Fuels Nanopore Studies

By BARRY FRIEDMAN, EXPLORER Correspondent

It is just about impossible to talk about the identification of pore networks in mudstones and shales, not to mention the possible energy within, without talking about hydraulic fracturing.

And you can't talk about that without talking about politics.

Which is exactly why one of this year's AAPG Robert R. Berg Outstanding Research Award winners won't talk about it.

To be fair, he doesn't have to.

"Understanding pore systems in mud rocks and shale is a scientific question, not a political question."

What comes next, he seems to be saying, is what comes next.

"The [fracturing] is necessary to connect and drain these nanopore networks," he said.

So, with that in mind, he wants to talk about what comes first.

Robert G. Loucks, a senior research scientist at the Bureau of Economic Geology, University of Texas at Austin, said that there were two aspects of these small pores that first caught scientists' attention:

► Their size – Most average only 100 nanometers (a nanometer is one billionth of a meter).

► Their location – Loucks said they are formed during thermal maturation and are not seen in immature organic material.

"These pore types were a complete surprise to the geologic community when we started this research in 2006," Loucks said, and here he credits fellow BEG researchers Robert Reed and Steve Ruppel, and Dan Jarvie with EOG Resources in Humble, Texas. All are AAPG members.

"Producing shale gas was still in its early stages and pore systems in these tight rocks were unknown," Loucks said. "Many people thought all production and storage was from microfractures."

He says his team's initial research discovered that in the Barnett Shale, in the example found there, the major types were pores associated with organic matter.

"We showed that the visible pores using a scanning electron microscope (SEM) were in the nanometer range."

And that was exciting, especially considering the same could probably be said about other sites in the state.

"We later showed that there were many more pore types in shale systems such as the Eagle Ford in south Texas," he said.

It was there, he and his team found the reservoirs contained common nanometer to micrometer mineral pores, which are the pores between mineral grains and within mineral grains. They then published a mudrock pore classification in the AAPG 2012 BULLETIN, summarizing their research.

### Questions ... And More Questions

Loucks, who also has previously won the Wallace E. Pratt and A.I. Levorsen Memorial awards as author of award-winning works, says he began wondering about these networks of nanopores after a simple request and subsequent finding.

"I had Core Lab do some conventional core analysis on Barnett Shale samples," he said. "They ran a few NMR samples, which showed a distribution of pore sizes."

And that's when he started wondering.

"When I got the results, there were no measurements of pore sizes provided."



LOUCKS

**"I think we have established the basic pore networks in mudrocks and shales, and many researchers are now perusing this work in more detail."**

He then asked what those pore sizes were, and was told that nobody knew because of the extreme small sizes of the pores.

"So I asked if anyone had looked for them using the SEM," Loucks continued. "They said they didn't think so."

Didn't think so?

And then he got *really* curious.

► Step One:

"Therefore, wanting to know the size and origin of the pores in mud rocks, I got together with Rob Reed and we prepared samples for the SEM," Loucks said. "The initial samples were rock chips, but we found that we could not clearly differentiate pores because of the amount of plucking of small grains."

A setback.

"The pores we at first thought were real were actually artifacts of sample preparation."

► Step Two:

"We then tried polished thin sections, but they also didn't work because of too much relief on the surface related to differential hardness," he said.

Ok, another setback.

► Step Three:

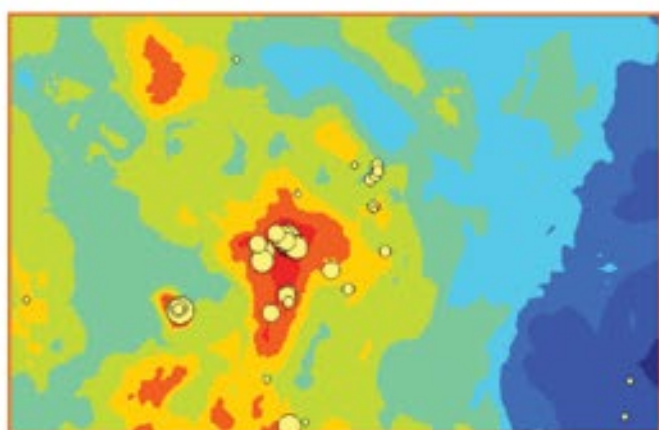
"At that point we heard from (AAPG member) Kitty Milliken (BEG senior research scientist and former AAPG Distinguished Lecturer) about Ar-ion milling, a technique used in the computer

See Loucks, page 54



# Nowhere to hide in Tioga County

## Multi-measurement imaging reveals secrets of the elusive Marcellus



*Sweet spot map (zoom) over a roughly 200-square-mile area in Tioga County, Pennsylvania. Hot colors indicate areas most similar to best producing wells in the region. Circles are sized to the first six months of production for all horizontal wells.*

Thanks to unconventional drilling and extraction techniques, the Appalachian Basin has experienced a multi-billion dollar economic resurgence. In Tioga County, Pennsylvania, a methodology called Multi-measurement Interpretation (MMI) has been introduced by NEOS GeoSolutions to provide a better understanding of the basin.

NEOS acquired airborne geophysical data – magnetic, electromagnetic (EM), radiometric, gravity, and hyperspectral – over 1,000 square miles of Tioga County. These data were integrated with existing geophysical, geochemical, and seismic measurements from various public domain and third-party sources and interpreted by NEOS and operator geoscientists. This low-impact,

environmentally friendly approach revealed subsurface features from the basement to the surface, helping explorationists pinpoint the sweet spots and avoid shallow gas geo-hazards in the play.

Using hyperspectral analysis, which classifies substances on the surface based on unique spectral signatures associated with the reflectance and absorption of both visible and invisible light, interpreters located numerous oil seeps and gas plumes. Of these, 90% were verified by geo-technicians on the ground. The seeps and plumes were then traced back into the subsurface along various pathways, including faults that had been mapped using an analysis of magnetic, seismic, log, and EM data.

Airborne EM resistivity measurements provided insights into both lateral and vertical resistivity variations throughout the geologic column, down to roughly 10,000 feet. When the EM voxel was depth-sliced at the Marcellus interval, geoscientists noted that resistive hot spots in the Marcellus corresponded to many of the county's "best well" locations.

In addition to analyzing the airborne datasets, geoscientists on the project also incorporated more traditional geophysical measurements into the interpretation. Well logs were analyzed to enhance structural control and to calibrate the airborne EM data. Seismic data were incorporated into the regional structural model and, in combination with the magnetic and EM data, provided insights into how faults were creating pathways for hydrocarbons to migrate toward the surface.

Finally, a cutting-edge geostatistical technique called predictive analytics was applied. The technique allowed geoscientists to mine all geo-datasets for subtle patterns and correlations that corresponded to the best wells, and to then pattern search for similar "correlative attributes" in areas that had yet to be drilled. This helped the project's underwriters to optimize their leasing, drilling, and hydraulic fracturing programs and to target future ground-based geophysical acquisitions in the most promising areas.

MMI has captured the attention of the region's major E&P producers. Since the early surveys in Tioga, NEOS has undertaken additional projects in Pennsylvania, compiling nearly 5,000 square miles of available regional data that are delivering unique, cost-effective insights into the Marcellus and Utica shale plays.

▶▶▶ To learn more about this project or others in the *Unlock the Potential* series, visit: [www.ThePotentialUnlocked.com](http://www.ThePotentialUnlocked.com)

### HIGHLIGHTS

#### KEY TECHNOLOGIES:

- MAGNETIC
- PASSIVE-SOURCE EM
- RADIOMETRIC
- GRAVITY
- HYPERSPECTRAL
- PREDICTIVE ANALYTICS

**AREA:** Appalachian Basin, Pennsylvania

**CUSTOMER:** Supermajor

**FOCUS:** Regional Mapping

**TYPE:** Unconventional

#### KEY INTERPRETIVE PRODUCTS:

- Regional resistivity voxels down to 10,000 feet
- Maps of lineaments, fault networks, and intrusives
- Maps of regional prospectivity derived via predictive analytics

#### CUSTOMER BENEFITS:

Cost-effective regional insight depicting the most (and least) prospective areas for leasing, drilling, or further geological and geophysical (G&G) study.



## Leadership from page 46

"It still exists and has my name on it," Rose beamed. "That was very fulfilling. They still exist. They have a leadership role in the field of petroleum risk analysis, worldwide. Not so much among the majors – they have their own way of doing things – but with smaller companies."

He retired from the company bearing his name in 2005, which also was the year Rose served as AAPG president.

"I'm still with the firm, but I don't do very much," Rose added. "They throw the old dog a bone every once in a while."

### Writing and Recognition

Since that time, he's also served

on the National Petroleum Council, and he's written and edited books and articles and given lectures on his area of expertise – risk assessment of petroleum exploration ventures.

Rose is arguably best known in the industry for a book he published in 2001, which some in the industry regard as the bible of exploration risk and resource assessment: "Risk Analysis and Management of Petroleum Exploration Ventures."

The volume is now in its seventh printing and has been translated into Mandarin, Japanese and Russian.

Also, of course, he has a long and distinguished career within AAPG.


That career reaches even far beyond AAPG borders; in 2013 Rose became the first American to receive the Petroleum Group Medal from the

Geological Society of London.

The award is presented annually to a geoscientist "in recognition of their outstanding contribution to the petroleum industry."

The award cited Rose specifically for playing "a pivotal role in both the science and the profession of our industry."

In his retirement, though – along with raising cattle on his ranch near Austin – Rose has taken an interest in writing about other subjects besides geology: in September 2012, Texas Tech University published his book, "The Reckoning: The Triumph of Order on the Texas Outlaw Frontier."

(An excerpt from the book provided the Historical Highlights column in the October 2012 EXPLORER.) 

## Renew Your Membership

**Q**uestion: When is the best time to renew your AAPG membership?  
Answer: Now!

Dues payments for the 2014-15 fiscal year are now being accepted by the AAPG membership department.

To pay your dues, simply log in to the AAPG website at [www.aapg.org](http://www.aapg.org), access your profile and click the PAY DUES NOW button.

## Loucks from page 52

industry to prepare very flat surfaces," Loucks said. "We decided to try this technique, but the machines to do this type of sample preparation cost approximately \$80,000."

Not just another setback, but an expensive one – one that could have ended the search.

But then some luck.

"We were lucky that the companies who made these millers were willing to prepare test samples for us," Loucks said, "and it is with these samples that we first saw the organic matter pores in the Barnett Shale."

Without hesitation, Loucks will tell you this was the ballgame – a new ballgame.

"It was the Ar-ion milling sample preparation techntbreakthrough."

### The Key: Pore Networks

Looking back, Loucks says it was the mystery of these pores that drove his team.

"We wanted to know what the pore networks were in shale-gas and shale-oil systems," he said. "These pore networks are the basis for creating permeability pathways for gas and oil out of the mineral matrix into the induced fractures."

And here's the money shot.

"These pores are the storage for much of the oil and gas in mudrocks and shales."

And where the work begins.

"I have worked on carbonate and sandstone reservoirs for years," he said, "and a basic understanding of pore networks is an essential element for knowing how to approach these reservoirs relative to exploration and production."


These pores in shales and mudstones, all agree, is the where the future economic reservoirs will come.

"I think we have established the basic pore networks in mudrocks and shales," he said, "and many researchers are now perusing this work in more detail."

Loucks also says there needs to be more work on quantifying how different pore types effect permeability, how different types of organic matter pores evolve, how migrated bitumen also produces pores and an extended permeability system.

Mostly, though, he says the key will be to " ... predict ahead of the drill bit what facies will have the best porosity and permeability."

Looking back, Loucks was right in suggesting there was potential in something that, literally, could not be seen – even after numerous attempts.

"I just didn't think answering this question would be as hard as it was." 

# COME TOGETHER

## Register Now!

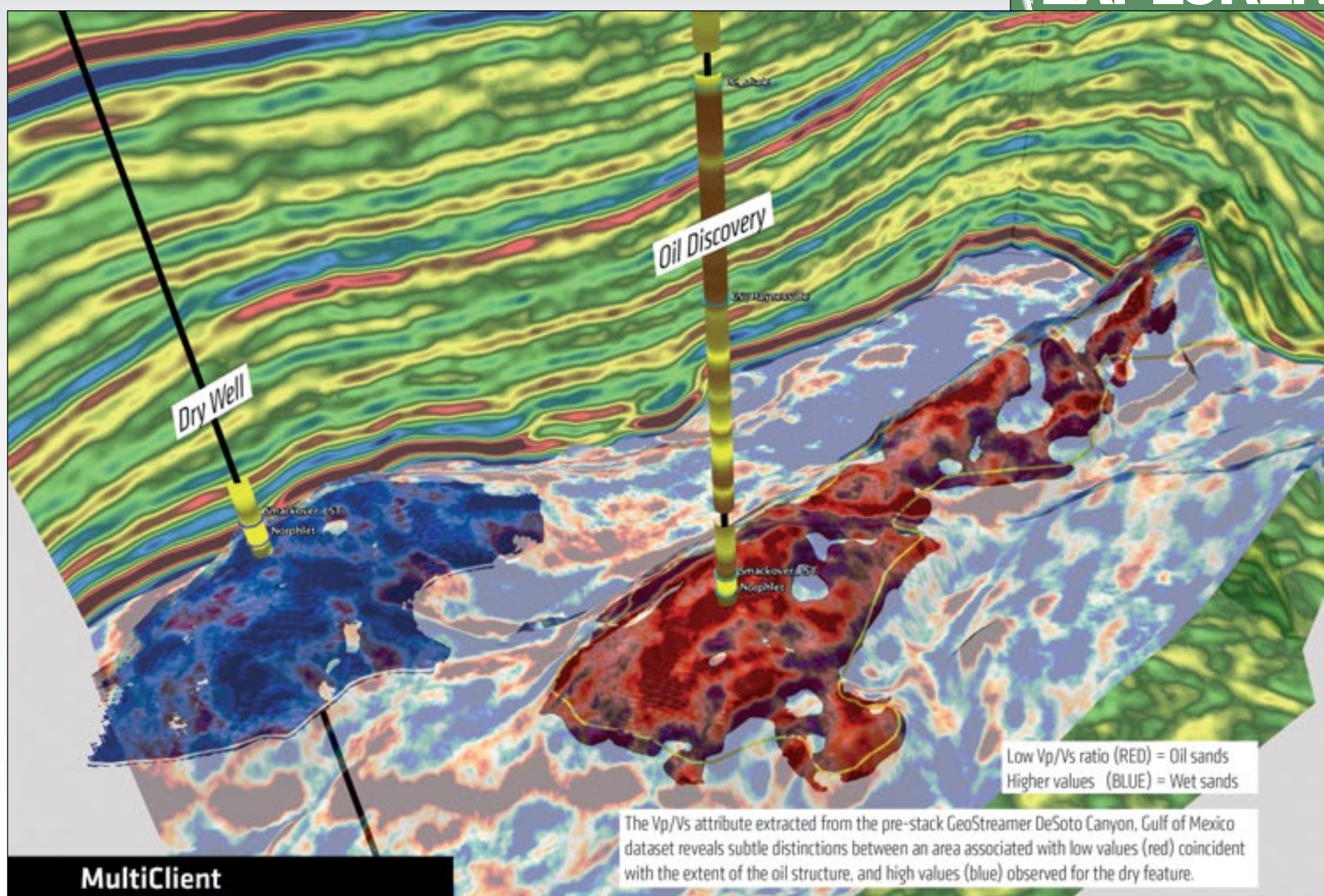


# OTC2014

**2014 Offshore Technology Conference**  
5-8 May • Houston, Texas, USA • [www.otcnet.org/2014](http://www.otcnet.org/2014)







## PIONEERING TECHNOLOGY FOR GREATER OPPORTUNITIES

PGS GeoStreamer® with GeoSource™ technology set the benchmark in seismic data quality and resolution, providing a new level of geological understanding in the world's most complex basins. Since 2007, much of the PGS MultiClient data library has been acquired using advanced GeoStreamer technology providing images of unprecedented clarity and reliability. PGS pioneering technology gives you the insight needed to explore and better define prospects in both frontier and proven hydrocarbon regions. When it's time to find oil faster, let us help you see the difference.

Supporting your exploration success

[globalmc@pgs.com](mailto:globalmc@pgs.com)



A Clearer Image | [www.pgs.com](http://www.pgs.com)



*Science-based model applied in Canadian Rockies*

# Permeability Trumps Storage in Shale Play

By LOUISE S. DURHAM, EXPLORER Correspondent

**S**hale formations can confound even the savviest geoscientist when it comes to determining the inner workings of the rock.

After expert evaluation, even the most attractive prospecting deal can be a tough sell owing to the fact that there are seldom any two zones that are laydowns. And there's almost always a new piece to each of these puzzles that requires some sophisticated high-tech explaining.

The geologists and geoscientists at Shale Petroleum Ltd. in Calgary, Canada, are all too familiar with this scenario.

And they have their own way of dealing with the challenges.

"We're geeks," said company president and CEO Paul MacKay. "We do the science and then go after the land position. That's our business strategy – and we then choose a U.S. partner or drill ourselves."

MacKay, an AAPG member, noted that they buy land where the rocks are highly permeable, allowing fluid to migrate through them with relative ease. He sides with the geoscientists who favor permeability over storage as key to defining unconventional reservoirs.

The company's landholdings in southern Alberta, largely within view of the Rocky Mountains, underscore his science-based opinion.

He noted that as the Rockies formed, the accompanying pressure on organic material converted it into oil and thrust it outward into the surrounding region.



MacKAY

Paul MacKay will be presenting a paper on Canadian shale resources at the inaugural Playmaker Canada Forum, set May 27 in Calgary, Canada.

"There is relic overpressure the closer we stay to the mountains, and we concentrate on defining the pressure window," said MacKay, who is often dubbed a rock fracture specialist by his peers.

He likened the mountain range to a pump, with the surrounding prairies serving as a sponge of sorts. He and his team are focused on buying parts of the "sponge" that are still being subjected to pressure and are permeable and fractured.

## Fractures Trump the Matrix

Canadian shale plays of Devonian age, such as the Horn River, Duvernay and Canol, are some of the more high profile names during this industry time of "shale rules."

The Jurassic Nordegg play is attracting attention along with the now-familiar Triassic Montney shale.

The Cretaceous-age Colorado Group (Alberta Group) is in Shale Petroleum's crosshairs, with the focus on the Second

White Specks formation, which is a fractured marine, inter-bedded shale, siltstone and fine-grained sandstone.

The name comes from actual white specks observed by the drillers, which were identified as cocoliths.

This naturally fractured reservoir has provided many hydrocarbon shows, but not the repeatable success that would establish a resource play.

Despite the dearth of repeatability, there have been a few vertical wells of significance drilled in the Second White Specks over about a 300-mile area, according to MacKay. Four of these have produced over one million barrels each, and three of them are still producing after 20 years.

Production depths range between 4,000 and 8,000 feet.

There is no apparent reservoir, indicating they are not your father's vertical well.

"In these cases, the well appears to have intersected a regional natural fracture system that has delivered significant volumes of hydrocarbons," MacKay said.

"In resource plays, there is an ongoing debate over the merits of matrix permeability versus the permeability of the natural fracture system," he noted. "In the case of the Second White Specks formation, the natural fracture system dominates the permeability system."

"Success in the Colorado Group is dependent on not only finding successful permeability pathways but also locating

over-pressured areas that will provide the driving force for fluid flow," he emphasized.

## Team-Led Innovation

So, you ask, when will the drill bits start turning on the company's lease holdings?

"We're getting ready to drill two science wells, which will be vertical," MacKay said. "We're always looking for the right combination of pressure and fractures near mountain thrust belts, and it takes time to find that exact fit."

"We must understand the rocks because we're a technology-driven company instead of one that's opportunity driven."

"The key to unlocking the petroleum potential of the Colorado Group, particularly the Second White Specks, is to exploit the natural flow paths within the rock volume by means of an integrated approach of geology, rock mechanics and reservoir engineering," MacKay emphasized.

"Innovation will come, not through one single discipline but through a team effort and a cross-discipline approach."

"As we work on fractured rocks, we must be communicating with reservoir engineers, or else the proposed prospect will never be drilled," he noted. "Advancing the integrated side in science is a test of teamwork versus any individual, no matter how knowledgeable."

"That," he added, "is really the challenge." ■

## AAPG GENERAL STORE

Come by the General Store, located in the AAPG Center, and support the AAPG Student Chapters. Proceeds from apparel, gifts and merchandise benefit the Chapters volunteering to work this meeting. Many items on clearance: Dress shirts, T-shirts, hats, jackets, etc.

Thank you for your support.

**AAPG**

store.aapg.org





# TODAY'S EXPLORERS HAVE EARTH SCIENCE DEGREES.

At Chevron, you'll join a team with the technology to take on big challenges, the integrity to do it responsibly, and the drive to keep the world moving forward. Are you up to the job?

## We're Hiring Experienced Earth Scientists

Requisition No.	Position
032233496	Interpretation Workflow Strategist/Developer - EPOS
006432892	Development Geophysicist
032232700	Senior Technical Research Geophysicist - Seismic Data Processing
006432893	Earth Modeler
032232708	Senior Seismic Data Analysis Specialist
081132160	G&G Operations Geophysicist
032224841	Petrophysicist - FES
032228270	Research Scientist: Reservoir Modeling
018734922	Pore Pressure Surveillance Specialist
081129098	Senior Geological and Geophysical Operations Geoscientist/Pore Pressure Specialist

To learn more about these positions and apply, visit [chevron.com/careers](http://chevron.com/careers)

**JOIN THE  
CHALLENGE.**



Human Energy®

An equal opportunity employer that values diversity and fosters a culture of inclusion.  
CHEVRON, the CHEVRON logo and HUMAN ENERGY are registered trademarks of Chevron Intellectual Property LLC. © 2014 Chevron U.S.A. Inc. All rights reserved.



## Ramirez Leads with Knowledge, Personality

By EMILY SMITH LLINAS, EXPLORER Correspondent

Creative. Dynamic. Innovative. Passionate. Exceptional.

These are some of the words used to describe Victor Ramirez, father, friend, exploration geologist and current president of the AAPG Latin America Region.

At first glance, the 47-year-old, unassuming Colombian may not seem like one of the senior leaders of a national oil company. But spending five minutes with Ramirez explains why this passionate individual is one of Colombia's industry leaders who is leaving a lasting legacy for AAPG.

Ramirez grew up in Manizales, Colombia, a beautiful town in the slopes of Ruiz Volcano, which erupted in 1985 and killed 30,000 people. The tragedy sparked an interest in understanding the earth and its natural phenomena.

Ramirez entered the geology school at the Universidad de Caldas in Manizales and later transferred to Colombia's National University in Bogotá. Studying at the National University exposed him to a broad range of political and social ideas as diverse as Colombia itself. This rich environment fueled his education, as did relationships



Ramirez discussing offshore exploration with the University of the Andes AAPG Student Chapter in Bogotá.

many of whom are influential players in the Colombian geology community today.

"I was lucky enough to have really smart classmates, and now dear friends, who always offered a stimulating learning environment," Ramirez said. "Besides that, some of the professors were leaders and pioneers of different topics of Colombian geology during the second part of the 20th century, and it was a privilege to be one of their students."

Petroleum geology professor and AAPG member Orlando Forero encouraged Ramirez to join AAPG as a student member in 1993.

"Professor Forero pointed out the importance of being part of a technical organization, first the local association and then AAPG," Ramirez said. "He even allowed some students to use his credit card to make the payment!"

### First Steps: Ecopetrol

Ramirez joined Ecopetrol, Colombia's national oil company, in 1997, and as a junior geologist he immediately began participating in the company's lead technical initiatives.

"From the beginning I enjoyed working with very experienced people, with access to the best technical data base in Colombia," Ramirez said.

Before long, he was leading teams of colleagues in exploring several Colombian basins. In his current position as offshore exploration superintendent, he leads a team in exploring Colombia's Caribbean offshore, a frontier basin that holds great promise of future hydrocarbon resources both for the company and the country.

During his time at Ecopetrol, Ramirez watched the company transition from a 100 percent state-owned entity and regulator to a public capital company accountable to stakeholders other than the Colombian government. Throughout the changes and his 17 years at the company, Ramirez remains satisfied.

"Ecopetrol provides to its employees plenty of development opportunities," he said, "and the dynamic of organizational change represents a challenge that I am still living as a rewarding career path."

### Meeting Mancini

A development opportunity Ecopetrol offers employees is the chance to study abroad, a benefit Ramirez took advantage of in 2005. Following the lead of several National University classmates, he enrolled in the University of Alabama's graduate program in geology, working under AAPG member Ernest Mancini.

Mancini served as AAPG's elected editor at the time, and he invited Ramirez to be an associate editor, a position he held until 2010.

Ramirez described Mancini as friendly, stimulating and approachable and said that, despite being very busy, Mancini took time to discuss projects on a daily basis. Ramirez appreciated how Mancini granted him access to Department of Energy projects and allowed him to work on a project in Colombia.

But what Ramirez most appreciated about Mancini was his integrity.

Continued on next page

## Registration Now Open

The integrated event for unconventional resource teams



25 - 27, August 2014 » Colorado Convention Center » Denver, CO

## Register now and benefit from:

- High-quality, **multidisciplinary**, peer-reviewed science and technology forums
- **4,500+ Engineers and Geoscientists** from every facet of the unconventional sector collaborating under one roof
- A **premier marketplace** for technology exchange between vendors and users
- Engaging **networking events** on the show floor

Early Bird Expires 14 July  
Learn More at:

**URTeC.org**



## PROFESSIONALnewsBRIEFS

**Roger Barnaby**, to president, DigitalStratigraphy.com, Houston. Previously senior geological adviser at Core Lab – Integrated Reservoir Solutions, Houston.

**Matthew Regis Bob**, has been appointed to the board of directors for Callon Petroleum. Bob is managing member of MB Exploration, Dallas.

**Bryan Delph**, to senior geologist, Cobalt International Energy, Houston. Previously retired geological adviser, BHP Billiton, Houston.

**Arlen Grove**, to president, Helotes Petroleum, Helotes, Texas. Previously vice president exploration, Prime Natural Resources, Houston.

**William "Bill" Houston**, to general manager-exploration, New Zealand Oil and Gas, Wellington, New Zealand. Previously geoscience manager, New Zealand Oil and Gas, Wellington, New Zealand.

**Ron Manz**, to vice president-Western Hemisphere exploration and new ventures, Murphy Exploration and

Production, Houston. Previously vice president exploration and appraisal-Europe and Africa, Nexen Petroleum, Uxbridge, England.

**Jock McCracken**, has been appointed as a senior adviser for Terra Nova Energy, Vancouver, Canada. He is president of Egret Consulting, Vancouver, Canada.

**Jeff D. Patterson**, to director, Barclays Capital, Houston. Previously senior geologist, Raymond James/Albrecht, Houston.

**Lewis "Stan" Pittman**, has been appointed head of Rango Energy Technical Advisory Board, Dallas. Pittman, an AAPG Honorary member, previously was with Hunt Oil, Dallas.

**Cary Purdy**, to worldwide director of oil and gas, FEI, Houston. Previously manager, Landmark/Halliburton, Houston.

**Daniel Schafer**, to reservoir management team leader, BP Azerbaijan Baku, Baku, Azerbaijan. Previously lead geologist, BP Exploration, Sunbury, England.



Ramirez (center) with AAPG President Lee Krystinik (fourth from left) and members of the University of Caldas AAPG Student Chapter – a chapter he helped start in 2013.

### Continued from previous page

"Besides his technical excellence, [Mancini] stands true to his ideas of making an honest contribution to our science without merchandising the knowledge to fulfill temporal agendas," he said of his mentor.

Mancini also appreciated working with Ramirez.

"Victor is exceptional," he said. "He came to the UA to earn an MS degree and be back at work with Ecopetrol in a managerial position in two years. He was focused, committed and hard working.

"He accomplished his goals," Mancini added. "I never had any doubt that he would."

Mancini said that Ramirez's multidisciplinary thesis, which involved sequence stratigraphy and petroleum system modeling, was "outstanding," and his contributions to the university's Center for Sedimentary Basin Studies were "many and significant."

Ramirez also contributed to several articles on Little Cedar Creek Field and Mesozoic deep gas reservoirs in onshore GOM basins, which were published in the AAPG BULLETIN.

Mancini also noted that, in addition to his studies, Ramirez showed dedication to his family.

"His son was into Spider-Man big time when he was at the UA," Mancini recalled. "I think Victor enjoyed that. Victor is very committed to his family. This is important."

Ramirez has two sons, now 11 and 8

years old. His wife Luisa is a veterinarian, and the family lives in Bogotá. One of Ramirez's favorite pastimes is taking them to visit natural attractions, an activity that combines his passions for geology, science fiction and his family.

"I enjoy the vision and understanding of time factor in nature, in a scale of millions to billions of years," Ramirez said, "and being able to talk, especially with my kids or youngsters, about several topics like dinosaurs, earthquakes, evolution, volcanoes, planets and energy."

### Industry Leadership

Ramirez's love for geology and helping other geologists make him a respected and effective leader in private industry and in geological associations.

AAPG member Helga Niño, a sedimentologist with Ecopetrol, met Ramirez in 2003 while he was studying well cores at the Colombian Petroleum Institute in Bucaramanga where she worked. Ramirez encouraged Helga to transfer to Ecopetrol in Bogotá, and she followed his advice some years later.

Niño worked on Ramirez's team for three years, and she said she deeply appreciated the way he recognized and valued her experience in the Colombian Caribbean.

"He has always recognized me for my work, and his confidence has always been very important for me," Niño said. "Victor always asks my opinion, he is very open to

See Ramirez, next page



## Playmaker Forum

May 27, 2014 • Calgary • Martha Cohen Theatre

Produced by Geoscientists for Geoscientists, the Playmaker Forum brings well-known, successful and distinguished Canadian speakers together.

Unparalleled case studies and discussion on discoveries and active plays by explorers who know them well.

### Summary of Topics:

Geoscience  
Engineering  
Prospecting Strategies  
Business and Marketing Skills

For information on the technical program and to register today go to:  
[WWW.CSPG.ORG/CONFERENCES](http://WWW.CSPG.ORG/CONFERENCES)

AAPG & CSPG Member: **\$295.00+gst**  
DPA Member: **\$275.00+gst**  
Non-Member: **\$355.00+gst**

Only 250 spots available.

## REGISTER TODAY!!



### SPONSORED BY



[www.aapg.org/career/training/in-person/forums](http://www.aapg.org/career/training/in-person/forums)





**Cossey & Associates Inc.**  
geoconsulting

## Deepwater Analogue Databases

<p><b><u>Fields/Reservoirs</u></b></p> <ul style="list-style-type: none"> <li>• Over 1250 Deepwater fields and reservoirs from 87 basins in 44 countries</li> <li>• Fully Searchable • Monthly, Single or Corporate Licenses</li> </ul>	<p><b><u>Outcrops</u></b></p> <ul style="list-style-type: none"> <li>• Over 3140 Architectural Elements from 137 outcrops in 22 countries</li> </ul>
---	--

**Details:**  
[www.cosseygeo.com](http://www.cosseygeo.com)  
 or email: [cosseygeo@aol.com](mailto:cosseygeo@aol.com)  
 or call +1 (970) 385 4800

**2014 Field Seminar**

- Tabernas Basin, Spain
- October 13-17, 2014
- 5 days, \$2950.00

## Ramirez from previous page

dialogue and new proposals and on top of everything he is fun and is a great human being."

Niño added that Ramirez's willingness to listen, learn and try new things has been an important part of giving him a key role in making progress toward offshore exploration in Colombia.

"I think the best way to find different results is to do things differently," she said, "and Victor is always open to new ideas that can be applied to successful operations."

### Time to Volunteer

Ramirez's knowledge and personality helped land him a leadership position

with Colombia's Petroleum Geologists and Geophysicists Association (ACGGP), an AAPG affiliated society.

"I was invited to give a lecture about my master's research in the ACGGP monthly meeting; then I was proposed as candidate to the technical vice presidency for 2008-2009," Ramirez said.

The following year, Ramirez was elected as ACGGP's youngest-ever president.

During that tenure Ramirez became increasingly involved with the AAPG Latin America Region, particularly in planning for the 2013 AAPG International Conference and Exhibition (ICE) in Cartagena, Colombia. Ramirez served as ACGGP president and AAPG Latin America Region secretary-treasurer simultaneously and worked to smooth out differences that existed previously between the two societies.

Enhanced collaboration between ACGGP and AAPG is a direct consequence of Ramirez's work, said Miguel Ramirez, AAPG Latin America Region past president, who describes Ramirez as an "even keel, calm guy who is fun to be around and is always ready to help."

AAPG member German Bayona, a contemporary of Ramirez's at Colombia's National University, has worked alongside Ramirez in both the ACGGP and the AAPG Latin America Region. He said Ramirez's dedication to both organizations is inspiring: "It is incredible how he enjoys working in professional associations."

### Encouraging Others

As AAPG Latin America Region president, Ramirez focuses heavily on increasing membership and engagement throughout the Latin America Region.

"Many of our efforts are focused on developing new leadership and promoting 'active' membership," he said, "not in a sense of a category, but as in a feeling of belonging to an organization that can give a lot but needs the contribution of its members."

His efforts are paying off.

Since becoming Region president in July Ramirez has overseen several successful events, including ICE Cartagena; a Geoscience Technology Workshop in Trinidad & Tobago; a Regional Student Leadership Summit; the launch of new communications vehicles, including a new regional website, newsletter and social media sites; and the formation of four new student chapters and two young professionals chapters in the region.

Ramirez said he still has a lot to learn about being Region president.

"I am still learning the complexity of an organization as big as AAPG. Being president represents a big responsibility for promoting our science, particularly toward the general public and the new generations of geoscientists," he said.

Forming the next generation of geoscientists is a responsibility this young president takes seriously. He often visits student and young professional groups and talks to them about some geoscience career challenges and the importance of being involved with AAPG.

"The message I give them sounds like a commercial, but it's true," he said. "Join us, meet people who can share your interest, have access to world class information and world class professionals, and develop your career skills by belonging to one of the most respected geological organizations."

If Ramirez's reaches students like others reached him, the industry and science of the Latin America Region has a bright future indeed. ■



## The Spirit Between Continents: Energy Geosciences in a Changing World



# AAPG

## International Conference & Exhibition 2014

Incorporating APPEX Regional – Prospect & Property Expo  
14-17 September » Istanbul Congress Center » Istanbul, Turkey

### » EXHIBIT

Gain maximum exposure and book your space today.

### » SPONSOR

Support the future innovations and discoveries of the geosciences.

### » ATTEND

Experience a world class technical program selected from a record number of abstracts.

## Istanbul, Turkey – Where Europe and Asia meet

ICE 2014 in Istanbul is sure to go down as one of the best-attended AAPG international conferences on record. At the crossroads of Europe and Asia, Istanbul's geostrategic location made it a perfect choice for ICE 2014. It is highly meaningful that the conference is co-organized by AAPG's Europe and Middle East Regions and the Turkish Association of Petroleum Geologists and entitled "The Spirit between Continents: Energy and Geosciences in a Changing World". At the turn of the 20th century, Istanbul was a crucial center for the development of oil in the Middle East which today possesses around half of the world's oil and natural gas reserves. Turkey is a natural bridge for transportation of these oil and gas riches from Asia to Europe. ICE 2014 is a perfect setting for the exchange of knowledge and ideas, deliberation and launch of constructive dialogues on energy integration for the sake of prosperity in the region and the world.

# ICE.AAPG.org

THIS EXHIBITION IS ORGANIZED WITH THE PERMISSION OF THE UNION OF CHAMBERS AND COMMODITY EXCHANGES OF TURKEY



HOSTED BY





4TH ANNUAL

# Summer Education Conference

DENVER, CO  
JUNE 16-20, 2014



## Courses Include:

- ▶ Getting Started in Fluvial Stratigraphy
- ▶ Subsurface Contouring: The Secrets to Optimizing Your Maps for Oil & Gas Exploration
- ▶ The Petroleum System: An Investigative Method to Explore for Conventional and Unconventional Hydrocarbons
- ▶ Applied Seismic Geomorphology and Seismic Stratigraphy
- ▶ Fundamentals of Siliciclastic Sequence Stratigraphy
- ▶ Basic Tools for Mudstone Exploration
- ▶ Risk Reduction for Plays & Prospects Using Quantitative Show
- ▶ RQ Toolkit: Using Rock Data for Reservoir Quality Assessment
- ▶ Exploration and Development in the Mississippian System
- ▶ Basic Seismic Interpretation
- ▶ Risk and Uncertainty for Contemporary Prospect Evaluations
- Applied Petroleum Systems for Reservoir Modeling: Finding the Sweet-Spots in Unconventional Reservoirs
- Reservoir Engineering for Petroleum Geologists

Hosted by:

### Summit Conference & Event Center

411 Sable Blvd. Phone: 303-343-3833  
Aurora, CO 80011 Fax: 303-317-6046

(Special AAPG Group Rates at Nearby Hotels)

### Registration and Information

Call AAPG toll free in the U.S. and  
Canada at 888.338.3387 or 918.560.2650  
F: 918.560.2678 • E: educate@aapg.org •  
W: www.aapg.org/career/training/in-person/education-conference/details/articleid/3193



**AAPG**

Summer Education  
Conference 2014

June 16-20, 2014 • Denver, Colorado

# Upcoming Education Courses

## LAST CHANCE

Deepwater Siliciclastic Reservoirs Field Seminar **April 11-16, 2014**  
California

Basic Well Log Analysis **April 28-May 2, 2014**  
Austin, TX

## FIELD SEMINARS

Play Concepts and Controls on Porosity in Carbonate Reservoir Analogs **June 1-6, 2014**  
Spain

Northern Appalachian Basin Faults, Fractures and Tectonics and Their Effects on the Utica, Genesee and Marcellus Black Shales **June 23-27, 2014**  
New York

Canoeing with Lewis & Clark: A Geologic Excursion along the Missouri River in Montana **July 14-19, 2014**  
Montana

Seismic Interpretation in Fold-and-Thrust Belts: Field Trip to the Southern Canadian Rocky Mountain Foreland **July 20-26, 2014**  
Alberta, Canada

## SHORT COURSES

Basic Well Log Analysis **July 28-August 1, 2014**  
Golden, CO

## ONLINE COURSES

E-Symposium: The Gulf of Mexico Basin: New Science and Emerging Deepwater Plays **May 22, 2014**  
2:00 p.m., CDT

Introduction to Shale Gas – Certificate Course **Ongoing**

Unconventional Resources – Certificate Course **Ongoing**

Giant Oil and Gas Fields – Certificate Course **Ongoing**

[www.aapg.org/career/training/](http://www.aapg.org/career/training/)



**AAPG**

Education



*Sponsorship, other issues on table*

## HoD Has a Full Slate to Consider in Houston

By LARRY WICKSTROM, Chair, AAPG House of Delegates

The annual meeting of the House of Delegates (HoD) will be held in conjunction with the AAPG Annual Conference and Exhibition (ACE), set this year in big and beautiful Houston.

The HoD meeting will begin at 8 a.m. Sunday, April 6, in the Lanier Ballroom of the Hilton Americas-Houston hotel.

All AAPG members are welcome to attend in the gallery area.

Your HoD officers and committees, with support from our AAPG staff, have been busy throughout this past year working through many items in preparation for



WICKSTROM

this important meeting, when the HoD will consider issues brought forward by the Resolutions Committee, the Rules and

**The specifics of the proposed bylaws amendment can be found on the AAPG website.**

Procedures Committee and a bylaws amendment from the Executive Committee. If you are interested in the governance

of AAPG, I encourage you to visit the HoD section of the AAPG website and read the last couple issues of the Delegates' Voice – it is open to all.

The main items to be voted on during the House meeting include:

- ▶ Requests for Affiliated Society status for the Geological Society of Brunei Darussalam and Sociedad Colombiana de Geologia (Colombian Geological Society).

- ▶ Suggested housekeeping changes to the HoD Rules and Procedures.

- ▶ A motion to amend the AAPG Bylaws eliminating the sponsorship requirement for full membership in the Association.

The motion for the bylaws change came to the House via a resolution from the Advisory Council (which is charged with the Association's long-range planning) to the Executive Committee. After deliberation, the Executive Committee passed a resolution to the House of Delegates to bring it to the floor for a vote.

The specifics of the proposed bylaws amendment can be found on the AAPG website. There also are a number of editorials both pro and con on this proposal in the Delegates' Voice.

\* \* \*

The HoD meeting is the ONLY time and place that you can receive a comprehensive group of reports on the status of AAPG, including membership, finances, publications, the AAPG Foundation and the AAPG Divisions.

We'll hear from AAPG President Lee Krystinik, AAPG Executive Director David Curtiss, the presidents of the AAPG Divisions, and candidates for president of the Association – all providing information that delegates can then take with them back to their local affiliates.

We also will hold elections for new HoD officers. This year's candidates are:

### HoD Chair-Elect

- ☐ Steve Goolsby, independent geologist, Denver.

- ☐ Robert Shoup, consulting geologist and manager at SCA, Singapore & Houston.

### Secretary-Editor

- ☐ Thomas C. Anderson, geologist, University of Utah, Salt Lake City.

- ☐ Kara C. Bennett, consulting geologist, Houston.

\* \* \*

Under new business this year we look forward to discussing a couple of other new options for HoD meetings:

- ▶ Implementation of an electronic audience response (voting) system for our meeting. This really could help streamline the voting and polling process – and add a little more fun to our meeting.

- ▶ Setting up procedures and technology to allow for electronic voting during the year (so the House can vote on minor issues at times other than at the annual meeting).

- ▶ Setting up the means to allow for limited remote attendance and voting by delegates at our annual meetings.

## CALL FOR PAPERS

▶ **Submission deadline:**  
**1 August 2014**

<https://mc.manuscriptcentral.com/interpretation>

A joint publication of SEG and AAPG  
**Interpretation®**  
A journal of subsurface characterization



## Rockies unconventional



Image courtesy of Stephen A. Sonnenberg

**Unconventional reservoirs are abundant in the Rocky Mountain region.**

**The unconventional include coalbed methane, tight oil, tight gas, shale gas, and oil shale.**

**These unconventional can be characterized by integrated geologic, geophysical, and engineering analyses.**

**The results of this special issue will be applicable worldwide.**

*Interpretation, copublished by SEG and AAPG, aims to advance the practice of subsurface interpretation.*

*The submissions will be processed according to the following timeline:*

**Submission deadline:**  
**1 August 2014**

**Publication of issue:**  
**May 2015**

### Special section editors:

**Steve Sonnenberg**  
[ssonnenb@mines.edu](mailto:ssonnenb@mines.edu)

**Bob Cluff**  
[bobcluff@discovery-group.com](mailto:bobcluff@discovery-group.com)

**Lee Shannon**  
[lee.shannon@anadarko.com](mailto:lee.shannon@anadarko.com)

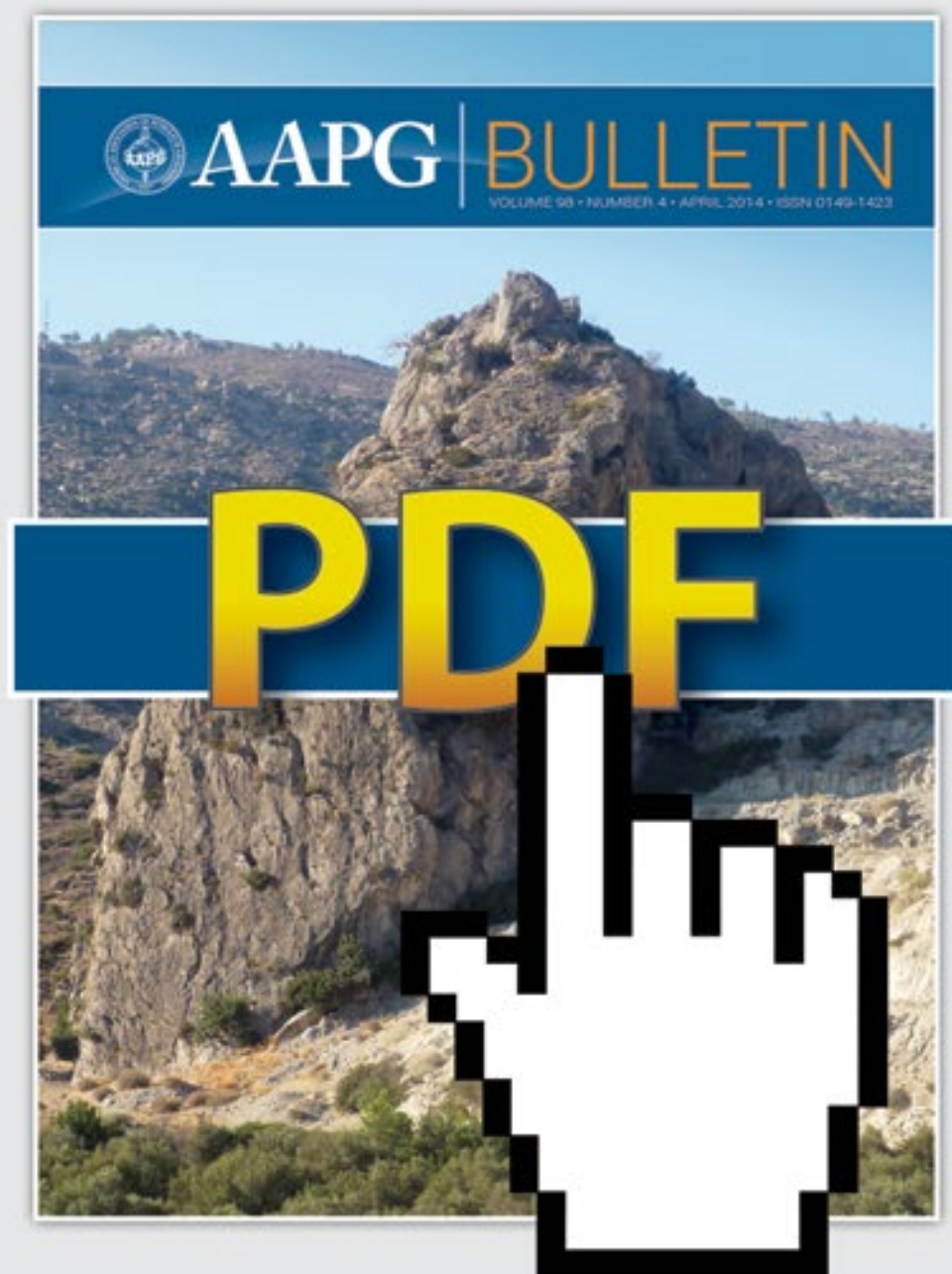
**Keith Shanley**  
[shanleypk@msn.com](mailto:shanleypk@msn.com)

**Al Lacazette**  
[alfred.lacazette@globalgeophysical.com](mailto:alfred.lacazette@globalgeophysical.com)



# DOWNLOAD

Your NEW April 2014 Bulletin Now!



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.

 **AAPG** | BULLETIN

Members, access the AAPG Bulletin online and submit your next paper at:  
[www.aapg.org/publications/journals/bulletin](http://www.aapg.org/publications/journals/bulletin)

## CHARACTERIZING THE NANUSHUK

E&P Note

Grant T. Shimer, Paul J. McCarthy, and Catherine L. Hanks

Core from wells in the Nanushuk Formation, Umiat Field, Alaska, show extensive shoreface and deltaic sandstones. There are four potential reservoir intervals in three stratigraphically distinct, regionally extensive depositional systems which are possible horizontal drilling targets.



## THREE-DIMENSIONAL RESERVOIR MODELING

Peter E. K. Devenegle, Matthew D. Jackson, Gary J. Hampson, Jonathan Stewart, Martyn D. Clough, Thaddeus Eshghebo, Michael E. Farrell, Craig S. Calvert, and James K. Miller

Four types of models were tested to capture geologic heterogeneity and fluid-flow behavior. However, their performance is more dependent on the quality and quantity of conditioning data and on the geologic scenarios implicit in them than on the choice of modeling technique.



## CHARACTERIZING DOLOMITES

Babatunde John Olanipekun, Karem Azmy, and Uwe Brand

Three phases of dolomitization occur in the Boat Harbour Formation, western Newfoundland. The earliest is D1 dolomicrite, followed by D2 consisting of coarse planar subeuhedral crystals, and D3 dolomite with large and coarse nonplanar crystals. Porosity is primarily associated with D2 where it is largely intercrystalline.



## LOUISIANA GROWTH FAULTING

Shamik Bose and Shankar Mitra

South Timbalier Block 54, offshore Louisiana, Gulf of Mexico, typifies the style of faulting in which complex transfer zones form above shallow salt bodies. An integrated structural model addresses the relationship between salt tectonics and the evolution of a convergent transfer zone.





*Ruth Schmidt: Her brilliant career*

## PROWESS Honors Historic Earthquake Survivor

By HEATHER SAUCIER, EXPLORER Correspondent

**O**n dusty, yellowed index cards in the AAPG membership archives are handwritten notes that tell a partial story about some of the organization's earliest members.

They have become precious insights to the Professional Women in Earth Sciences (PROWESS) Pioneer Women committee as it launches a series of biographies honoring the organization's first 100 female members – leading up to its centennial in 2017.

And one of the cards belongs to Ruth A.M. Schmidt, the first to be featured in the celebratory countdown.

Living in Anchorage, Alaska, the 97-year-old former geologist was one of few female geoscientists in her day and proactively supported women choosing careers in science.

She also is a survivor – Schmidt is one of five scientists who were trapped on Portage Lake, 56 miles southeast of Anchorage, as it feverishly cracked, split, swelled and sunk during the 1964 Great Alaska Earthquake.

After the quake she was instrumental in helping the city of Anchorage document the extensive damages in an effort to mitigate future risks in a politically charged atmosphere.

"As geologists, we are trained to learn from the past," said Carol McGowen, AAPG's manager of Sections and Regions and liaison to the PROWESS committee. "Learning from our predecessors as women geoscientists is equally important. These biographies will



*Geologist Ruth Schmidt, one of the first 100 women members of AAPG, doing field work in Czechoslovakia, 1968 – and it was a lot calmer there than when she worked in Alaska.*

prove there is a lot to learn."

Unable to personally share the highlights of her career because of health reasons, Schmidt is described as a passionate, no-nonsense scientist whose philosophies were typically on the cusp of forward thinking, said Sally Gibert, a land planner and geographer who met Schmidt in 1974.

Working as a college intern for an environmental center in Anchorage, Gibert formed an unlikely bond with Schmidt over an overdue library book, which Schmidt checked out and promised to return "when someone else asks for it."

"She was and is, even today, a powerful

personality and very much to the point, but also very kind-hearted and very generous," Gibert said in a telephone interview from Anchorage. "She was particularly interested in helping women in the field of science."

### 'One of the Boys'

After earning her master's (1939) and doctorate (1948) degrees in geology from Columbia University, Schmidt worked for the U.S. Geological Survey in Washington, D.C., and in Anchorage. She also worked as a geology professor and served as the first chairperson of the geology department at

the University of Alaska-Anchorage.

"She is a pioneer woman in the field of geology. There were virtually no women geologists until about the 1960s," Gibert said. "In field camp situations, she said she simply acted like 'one of the boys.' Her strong personality far outweighed her small stature."

Thrilled by international geological trips, Schmidt, who always kept a hint of her native Brooklyn accent, read and spoke German, a bit of French and studied Russian.

She was working as a professor at Anchorage Community College the day of the Great Alaska Earthquake – the most powerful earthquake to strike the United States and North America with a magnitude of 9.2.

It was March 27, 1964, when she and four others drove an Arctic Cat snow machine onto frozen Portage Lake to drill holes into three feet of ice to measure water depths. Schmidt wanted to determine the location and the rate of sedimentation in the lake from the Portage Glacier and other sources.

She brought with her an expert from the local U.S. Forest Service and three area students.

"A bunch of geology students and field trips are always a fun thing. They often have a bit of adventure to them," said Mike Mitchell, a retired geologist and one of

[See Schmidt, page 67](#)

## GTW Brasil 2014: Stratigraphic Traps and Play Concepts in Deep Water Settings

**14-15 May 2014 | Rio de Janeiro**

Co-hosted by AAPG Latin America Region and Associação Brasileira de Geólogos de Petróleo (ABGP)



Join the GTW Brasil discussion with leading operators in Latin America, Africa, and Gulf of Mexico. Gain greater understanding of geological and geophysical attributes of stratigraphic traps in deep water settings. Learn more from equatorial margin exploration analogues.

### Session Themes:

- Case Histories and Global Analogs
- New Concepts on Stratigraphic Traps
- Stratigraphic Traps in Brasil
- Role of Technology in Defining Stratigraphic Traps

**Register Now**

[www.aapg.org/career/training/in-person/workshops](http://www.aapg.org/career/training/in-person/workshops)



**AAPG**  
Latin America Region

**Geosciences Technology  
Workshops 2014**



## STUDENTS FROM THESE UNIVERSITIES WON A 2014 L. AUSTIN WEEKS UNDERGRADUATE GRANT:



**The L. Austin Weeks Undergraduate Grant program** awards deserving geoscience students and their college or university departments with \$1,000 in financial funding. The award is split between a student and his or her department, each receiving \$500. The grant is intended to support the educational expenses of undergraduate geoscience students and their departments.

**Only 64% of the applicants were able to receive awards this year. To enable this program to touch more qualified students, contribute to the L. Austin Weeks Undergraduate Grant Fund today.**

## Universities



Adam Mickiewicz University, Poland  
 Al-Azhar University, Cairo, Egypt  
 Angelo State University, Texas  
 Auburn University, Alabama  
 Babes-Bolyai University, Cluj, Romania  
 California State University, Fullerton  
 California State University, Long Beach  
 California State University, Northridge  
 Colorado Mesa University  
 Diponegoro University, Semarang, Indonesia  
 Eotvos Lorand University, Budapest, Hungary  
 Federal University of Rio Grande do Sul, Brazil  
 Idaho State University, Idaho  
 Imperial College, London, UK  
 Indian Institute of Technology Roorkee, Uttarakhand, India  
 Indian School of Mines, Jharkhand, India  
 Industrial University of Santander, Colombia  
 Institut Polytechnique LaSalle Beauvais, Picardie, France  
 Institut Teknologi Bandung, Tamansari, Indonesia  
 Ladok Akintola University of Technology, Ogbomoshaz, Nigeria  
 Makerere University, Kampala, Uganda  
 Memorial University of Newfoundland and Labrador, Canada  
 National University of San Marcos, Lima, Peru  
 Northwest Missouri State University  
 Obafemi Awolowo University, Osun State, Nigeria  
 Pakuan University, West Java, Indonesia  
 Pandit Deemdayal Petroleum University, Gujarat, India  
 Saint Louis University, Missouri  
 Sam Houston State University, Texas  
 Santa Barbara City College, California  
 Stephen F. Austin State University, Texas  
 Suez University, Egypt  
 Texas A&M University  
 The University of Alabama  
 The University of Arkansas  
 The University of California, Berkeley  
 The University of California, Santa Barbara  
 The University of Delhi, New Delhi, India  
 The University of Dhaka, Bangladesh  
 The University of Houston, Texas  
 The University of Idaho  
 The University of Illinois at Urbana-Champaign  
 The University of Indonesia  
 The University of Iowa  
 The University of Kansas  
 The University of Kentucky  
 The University of Lagos, Nigeria  
 The University of Lampung, Indonesia  
 The University of Leicester, UK  
 The University of Louisiana at Lafayette  
 The University of Miskolc Borsod-Abaúj-Ze, Hungary  
 The University of Missouri  
 The University of Nevada, Las Vegas  
 The University of Pembangunan Nasional "Veteran", Yogyakarta, Indonesia  
 The University of Petroleum and Energy Studies, Uttarakhand, India  
 The University of South Carolina  
 The University of Texas at Arlington  
 The University of Texas at Dallas  
 The University of Texas at El Paso  
 The University of Tulsa, Oklahoma  
 The University of Utah  
 Trisakti University, Jakarta, Indonesia  
 UAE University, Al Ain, U.A.E.  
 Universidad de Colombia, Sede Medellín  
 Universitas Gadjah Mada, Yogyakarta, Indonesia  
 Utah State University  
 West Texas A&M University  
 Western University, Ontario, Canada  
 Wichita State University, Kansas



## The Great Alaskan Earthquake of 1964:

# Recollection of an Adventure on Portage Lake

By MIKE MITCHELL

I remember exactly where I was when the quake hit: Standing on the ice of Portage Lake.

The ice shook so hard I couldn't run – I could only stand where I was and fight to stay on my feet.

What I remember most vividly about the quake is the sound. A great rumbling came from the earth, the very air seemed to vibrate and across the rumble came the sound of the ice cracking. Big booming sounds, coming from the south toward Whittier, seemingly passing directly underneath me, then shooting on to the north.

Six-hundred feet of cold, gray glacier water below me and nothing but the sky above.

When the shaking finally began to subside, the sound of the breaking ice was replaced by a new sound coming from above – I looked up and there were snow slides coming down every mountainside. I started running toward the middle of the lake.

My colleagues were out there near a hole we had drilled through the ice to find out how deep the lake was. As I ran, it began to snow big, dirty gray snowflakes. We met in the middle. Good-fortune! No one was missing. No one had been hurt. Some excited talk about how the hole in the ice alternately spouted water and sucked air when the quake hit, but we wasted no time in deciding our first priority was simply to get off the lake!



MITCHELL

**When the shaking finally began to subside, the sound of the breaking ice was replaced by a new sound – snow slides coming down every mountainside.**

\* \* \*

The dark of night was with us as we neared the shore. It was then that we realized we had, indeed, been fortunate to be far out on the ice when the quake hit. Giant, jumbled blocks of ice, with water in between, lay between us and the shore. But we were not to be deterred. We tied ourselves together with a rope and set out across this no-man's land in the dark.

Suddenly someone shouted: "It's moving! It's moving!"

At that moment, for me, it was like the universe changed gears. We all stopped in our tracks and looked, as if for the first time, at what was happening around us.

Waves!

Broad slow motion waves, higher than a man, were rolling onto shore and we were right in the middle of them, standing on automobile size broken pieces of lake ice that were rotating with the rise and fall of the waves ... suddenly you could hear the ice crunching and grinding, the water gurgling.

We beat a hasty retreat back toward the middle of the lake. We then decided to circle to the east and look for a spot where we could get across the moving ice along the shore.

\* \* \*

In Bear Valley, maybe a mile from the big waves, we finally made it off the lake. By that time we were all cold and getting hungry. Nobody wanted to spend the night in the open! We decided we would try to walk out through the train tunnel. We had no flashlight, but we thought we could follow the tracks in the tunnel or the tunnel walls.

Inside the tunnel, you could hear the earth; it was making a noise – a noise so low you sensed it as a vibration in the rock as much as a sound in the air.

But it was not the otherworldly blackness in the tunnel and the strange earth-sound that made us turn around once again.

*Ssssiit, crack!*

"What's that?"

*Ssssiit, whomp!*

"Oh, God! It's rock falling from the ceiling."

I remember the pounding in my chest with that realization.

Walking back out of the tunnel was perhaps the scariest part of the day. I'll never forget that strange sound/vibration coming from the solid rock inside the mountain. Nor will I ever forget the sudden, heart pounding fear of being smashed in the head by a rock falling through the dark.

Back outside, someone said they thought they remembered a small cabin near the entrance to the second tunnel. So we started to walk along the tracks in that direction. It was then that we noticed a red glare in the sky over the mountain toward Whittier – a flickering reflection dancing on the bottoms of the clouds.

As we walked along, we began to discuss "What was it that had happened to us?"

We gave serious consideration to the idea that Anchorage might have been hit in a nuclear attack. And if that were so, maybe all our families and friends were gone.

\* \* \*

There was a small cabin at the entrance to the second tunnel to Whittier. The man who opened and closed the doors to the

**Continued on next page**



# AAPG

# CAREER CENTER

**AAPG Committed to being your career partner for life**

**AAPG Career Center offers professional services to help with all of your career needs!**

## Career Center Resources

- Career Learning Center
- Career Tips
- Professional Resume Writing
- Career Coaching
- Social Networking / Profile Development
- Reference Checking / Employment Verification
- Discounted Test Prep Services Through The Princeton Review

[www.aapg.org/careers/careercenter.cfm](http://www.aapg.org/careers/careercenter.cfm)





Visual evidence of the Alaska earthquake's power and destructive impact.

## Schmidt from page 64

the students who assisted Schmidt on the surface of the two-mile long lake.

No one, however, could have predicted the adventure that nature had in store that day.

### Whole Lotta Shakin' Goin' On

Schmidt and Mitchell were near Bear Valley, on the lake's northeast shore, marking the location for a new borehole, while the others were closer to the lake's center. In 15-degree weather, the team had just completed drilling the first bore hole near the center of the lake when the rumbling began – an introduction to the world's second most powerful earthquake next to the 1960 earthquake near Valdivia, Chile, which registered 9.5 in magnitude.

"We didn't have time to do anything. We were fixed to the spot where we were at," Mitchell recalled with acute clarity. "We just kind of rode the ice fighting to stay on our feet and not fall down. The ice was cracking and we could hear these big booming sounds."

The earth rolled underneath them for approximately three minutes. Then, as Schmidt and Mitchell looked up, they watched huge amounts of snow rush down the surrounding mountains.

"You could hear these avalanches taking place," he said.

Schmidt and Mitchell carefully navigated their way over cracks in the ice. They wanted to account for the others whom they soon found to be unharmed. The avalanches spit gusts of snow into the air, reducing visibility to 10 feet. The five boarded their Arctic Cat and, in a rush to beat the fast-approaching dusk, steered their way toward the northwest shore.

However, the ice near the shore was moving and too fragmented to reach dry land, not even after the group abandoned

their vehicle and walked, all clutching a rope in case someone slipped into the frigid, swirling water.

Undecided about whether to stay on the lake until they could be rescued or try another path to the shore, Schmidt belonged to the camp of "we need to get the heck off this lake," Mitchell recalled.

The group made its way toward Bear Valley, where the ice remained more intact and eventually reached the shore.

"Ruth was certainly the one we listened to as a source of age and wisdom and calmness. She was sort of a guiding hand in the group," Mitchell said. "I think she handled herself very well. There was no panic."

### Reaching ... Safety?

As they struggled in the dark to find a safe haven, they saw a display of orange and pink flickering lights in the sky. None had ever experienced such a large earthquake, and they all knew the Soviets had four nuclear missiles pointed at Anchorage during this Cold War period.

Unsure if they had experienced an earthquake or nuclear attack, the group didn't find out until they came upon a 12-by-20 foot cabin belonging to a patrolman of the Alaska Railroad and his family.

There, they hung a coffee cup from the ceiling to crudely measure the aftershocks that continued throughout the night. When the radio at the cabin was able to pick up airwaves hours later, an earthquake was officially confirmed. The orange and pink lights were from fires, as parts of Whittier were consumed by flames.

After a sleepless night, the group was picked up by helicopter and taken to a nearby highway that was cut and sliced by deep crevices. It was reported that the front of Portage Glacier, once solid ice and nearly vertical, was shattered into a gentle slope.

The quake caused countless ground fissures, collapsed structures and tsunamis – killing an estimated 139 people.

### Doing Her Part

As years passed, Schmidt and her team never reunited to share their experience as a group. Other than a handful of articles, the earthquake as experienced on Portage Lake has not been widely told.

What would Schmidt have to say today?


Gibert recalls the fearless geologist expressing disappointment for not experiencing the event in Anchorage, for the rumbles and asphalt waves would have been much more intense – perfect for adventurous types.

Schmidt soon made her own waves, though. As the appointed federal coordinator of the Engineering & Geological

### See Earthquake, page 73

we learned that Alaska had been struck by a great earthquake.

In the morning, a helicopter scouting damage to the Alaska Railroad gave us a ride over Portage Creek back to our camp. That afternoon we hiked out to the now-severely damaged Portage Café, near the junction of the Seward Highway and Portage Glacier Road. Late in the day, a military helicopter picking up people stranded by the earthquake gave us a ride back to Anchorage.

The five of us had a once-in-lifetime-experience that we were lucky to survive. From the perspective of a budding geologist, I could not have asked for a more dramatic first-hand experience of geology in action! 

### Continued from previous page

tunnel when the train would come through lived there with his wife and baby girl. The first thing we asked was: Did they know what had happened?

They didn't know. They had a radio but had not been able to pick up anything but a couple brief snatches of emergency civil-defense type talk since the ground shook.

We tied a cup to a long string and hung it from the ceiling. Then we sat around and talked and drank coffee and watched the cup on the string swing every time an aftershock would come rumbling through.

Late that night, when an Anchorage radio station finally came back on the air,

Well Log Printers from \$2995.00  
Well Log scanners from \$499.00  
Digitizing only \$17.00 per curve



## Well Green Tech

Solutions Based On Industry Needs at Affordable Prices

Visit Us at AAPG Houston

Booth 1009

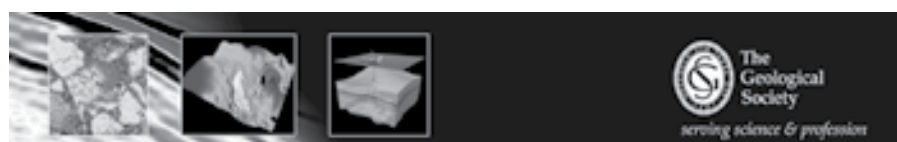
Come See What's New

For All Your Needs

Tel: 403-800-5290

sales@wellgreentech.com  
www.wellgreentech.com  
digitallas.com

Well Log Printers  
Log Scanners  
Software  
Digitizing Services



Corporate Sponsors:



Convenors:

Pete Armitage  
BP  
Alan Butcher  
ED Natural Resources  
Anita Cosma  
ConocoPhillips  
Cathy Hollis  
University of Manchester  
Rob Lander  
Geocom  
Jenny Omma  
BP  
Richard Worden  
University of Liverpool

Conference Sponsors:

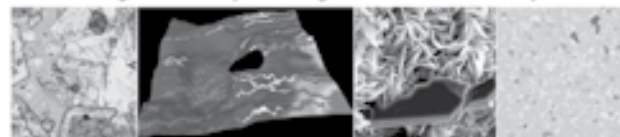


Registration Now Open

## Reservoir Quality of Clastic and Carbonate Rocks: Analysis, Modelling and Prediction

28-30 May, 2014

The Geological Society, Burlington House, Piccadilly, London



Porosity and permeability exert a fundamental control on the economic feasibility of a petroleum accumulation and need to be quantified from basin access to mature production. Quantitatively reporting the mineralogy and pore space characteristics of reservoir rocks is vital in establishing the controls on reservoir quality. Only by doing so it is possible to build predictive capability, essential to successful geological modelling and cross-disciplinary integration. This issue is becoming ever more critical with exploration and production of petroleum in increasingly challenging conditions and from less conventional reservoirs.

Despite the importance to the industry of understanding the controls on porosity and permeability of reservoirs, fundamental issues lack consensus. Reservoir quality is controlled by interdependent sedimentary and diagenetic factors, including sediment provenance and weathering, depositional environment and climate, compaction, recrystallisation and dissolution, authigenic mineral growth, petroleum charge and structural deformation.

This conference seeks to address the factors and processes controlling rock properties of clastic and carbonate rocks as well as showcase novel analytical techniques and demonstrate diagenetic modelling capability. Delegates from both academic institutions and industry are encouraged to attend and contribute in order to represent the range of current reservoir quality research.

### Themes

- Provenance and environment of deposition
- RQ in the sequence stratigraphic framework
- Clay mineral diagenesis in clastic and carbonate rocks
- Quartz diagenesis in clastic rocks
- Carbonate diagenesis in clastic rocks
- Near surface diagenesis as a control on reservoir quality in carbonate systems
- Porosity modification in the burial realm
- Fluid-rock interactions
- Petrophysical RQ characterisation and upscaling
- Application of RQ analysis for petroleum exploration and production
- Porosity upides – predicting anomalously good reservoirs
- RQ of unconventional reservoirs
- Computer modelling of diagenesis
- Experimental approaches to understanding RQ
- Analytical techniques
- Geomechanical and structural controls
- Using RQ to improve rock physics models
- Modern environment, outcrop and subsurface analogues

For further information please contact:  
Laura Griffiths, The Geological Society, Burlington House, Piccadilly, London W1J 0BG.  
Tel: +44 (0)20 7434 9944 Fax: +44 (0)20 7439 8975



At the forefront of petroleum geoscience

www.geolsoc.org.uk/petroleum



# Stratigraphy Vindicated by Cook's Farm Coal Bust

By HUGH TORRENS and PETER WIGLEY

Great Britain in the late 18th and early 19th centuries was undergoing great change. The Industrial Revolution was in full flood and there was an insatiable desire for coal to turn the wheels of industry.

Traditional mining areas were in the north of England, Scotland and south Wales. To the south, coal was less abundant – however, coal fields were known in the Bristol area since Roman times and their occurrence was to spawn other coal trials in the region.

It was one of those trials which, although unsuccessful, saw the first ever application of stratigraphic method in mineral exploration.

\* \* \*

At the end of the 18th century coal fever was endemic, as was the fever for canal building. Among other similar ventures was a grandiose but ill-fated proposal to build a canal, the Dorset and Somerset canal, which was to have connected Bristol to Poole on the English Channel. Some of the canal investors lived in or near the Somerset town of Bruton (some 25 miles south of Bristol).

Shortly after the canal was proposed these same investors, together with others, became involved in a scheme to test for coal at Cook's Farm, Brewham near Bruton. They believed that if coal was discovered, not only would they have had a ready supply for local industry but also a nearby canal to transport the rest to the



TORRENS



WIGLEY



Figure 1 – Location map of the Cook's Farm coal trial in southeast England.

coast for export.

These adventurers raised the sum of £2,000 for the coal trial and took out a lease on land owned by Bruton School. The lease included a production-sharing agreement in which the school would initially receive 5 percent of all coal produced, increasing to 10 percent after five years.

The school also insisted that the site be returned to its original condition in the event that the trial was unsuccessful.

The selection of the site for the test was based on the apparent similarity between surface lithology and soils at Cook's Farm

with that seen elsewhere in areas where coal had already been found. The proximity of the trial site to the proposed route of the canal may also have been a factor in the selection of its location.

Their prospectus declared that the site was "scientifically acknowledged to be the most eligible for such a trial" and a qualified engineer had apparently been consulted.

Actually, there was no basis for this claim – the clays and marls found above the Carboniferous Coal Measures in the north of the country were not the same as those seen at Cook's Farm.

This fact later was categorically demonstrated by William Smith, the founder of stratigraphy, by the application of his new system, which solved the problem of many similar recurring lithologies found in England, which previously had bedevilled all earlier attempts to find coal here, outside the known coalfields.

\* \* \*

In 1803 diggers at Cook's Farm were

**Continued on next page**

## AAPG Middle East Calendar of Events: 2014

### Geosciences Workforce: Attraction & Retention

14 - 16 April 2014 • Abu Dhabi, United Arab Emirates

### Producing the Last Drop: Capitalizing on People & Technology

28 - 30 April 2014 • Muscat, Oman

### 2014 LIPE & AAPG Northern Arabia Geoscience Conference and Exhibition

27 - 29 May 2014 • Beirut, Lebanon

### AAPG/SPE E&P Data Management

9 - 11 June 2014 • Istanbul, Turkey

### Effective Training for the Young Upstream Generation

16 - 18 June 2014 • Manama, Bahrain

### EAGE/SPE/AAPG Shale Gas Workshop

Dubai, UAE • 21 - 24 September 2014

### Stratigraphic Traps of the Middle East

20 - 22 October 2014 • Muscat, Oman

### Unlocking the Potential of Low Yielding Reservoir

3 - 5 November 2014  
Manama, Bahrain

### Siliciclastic Reservoirs of the Middle East

2 - 4 December 2014 • Abu Dhabi, United Arab Emirates

For more information visit  
**middleeast.aapg.org**



**AAPG**  
Middle East Region



## Continued from previous page

employed to sink the shaft, and later a waterwheel was installed to assist in pumping operations. Growing progress reports appeared in the local newspapers and optimism ran high; before too long the shaft had reached a depth of 120 feet.

It was on March 24, 1805 – a red letter day in the history of geology – that William Smith visited Cook's Farm.

His investigation of spoil from bottom of the pit revealed specimens of a small lobate oyster, which is now known as *Gryphea* (*Bilobissa*) *dilobotes*. Smith knew this fossil to be characteristic of the Kelloways Stone, which was at the base of his Clunch (Oxford) Clay.

From his application of what we would now call biostratigraphy, Smith immediately knew that the trial was far too high in the geological succession for coal to be encountered.

We know from Smith's nephew, John Phillips, that Smith must have shared this information, for Phillips later writes "in spite of remonstrances from Mr. Smith and his intelligent friends, the speculators proceeded at a ruinous expense."

Operations continued until Christmas 1807 when, at a depth of 652 feet, water from the Great Oolite aquifer flooded the shaft. This effectively ended mining operation.

In 1808 an attempt was made to auction off the lease, waterwheel and other material used in the trial but due to subscriber resistance the sale was postponed. An unsuccessful attempt was made to raise additional funds for the purchase of a steam engine to pump out the shaft, but finally in 1810 the company was liquidated.

It was a bad day for the adventurers – several of whom subsequently went bankrupt – and also was a sad reminder for those who had ignored William Smith's pioneering stratigraphic method.

\* \* \*

A part of William Smith's 1815 geological map (figure 2) is shown extending across the Cook's Farm area. With the aid of modern geological mapping it can be demonstrated that Smith had an excellent understanding of the surface geology of the area.

In the map's top left hand (NW) corner the Coal Measures (crosses showing collieries in the southern part of the Radstock basin) are clearly shown overlain by his Red Ground, now known as the Triassic Mercia Mudstone, which also outcrops to the west.

Moving east, Smith shows the Jurassic succession from Liassic shale and marl (White and Blue Lias) up the escarpment through middle and upper Jurassic strata, consisting of Fuller's Earth, Inferior and Great Oolite, Forrest Marble, Cornbrash, Kelloways and Clunch Clay (Oxford Clay).

In the area around the Fifehead Magdalen-1 well the Coral Rag occurs with Oaktree, (Kimmeridge) Clay, Portland and Purbeck beds outcropping to the east.

The wide expanse of the chalk can be seen on Salisbury Plain (shown in green) and to the extreme east Tertiary sands and clays outcrop.

As well as being aware that the trial at Cook's Farm was too high in the succession to find coal, Smith also knew that in the Somerset coalfield, 10 miles north, coal often occurred beneath the Red Ground (Triassic) with an unconformity between it and the Coal Measures beneath, which was certainly not the case at Cook's Farm.

Although he knew that this coal field



Graphic courtesy of UKOGL

Figure 2 – A part of William Smith's 1815 geological map (Y map courtesy of the National Museum of Wales) in the southern U.K., with the seismic section CV80-082 projected along the line of section. Also shown is the location of the Cook's Farm trial together with more recent wells and boreholes.

\* \* \*

abruptly terminated against the limestone of the Mendip hills he seems not to have completely discounted the idea that coals might have occurred south of the Mendips. Indeed, in 1813 he was involved in an attempt to find coal to the south, beneath the Triassic at Compton

Dundon, near Glastonbury.

However, it is now thought unlikely that Coal Measures ever extended much further south and certainly there is no evidence of Coal Measures being preserved in any of the modern wells shown on the map.

Today, it is known that the Cook's Farm colliery trial was located on an east-west structural feature called the Bruton High. As

See **Cook's Farm**, page 71

## CALL FOR PAPERS

► Submission deadline:  
**1 August 2014**

<https://mc.manuscriptcentral.com/interpretation>

A joint publication of SEG and AAPG  
**Interpretation**<sup>®</sup>  
A journal of subsurface characterization



Society of Exploration Geophysicists  
The international society of applied geophysics



AAPG  
Advancing the World of Petroleum Geosciences™

## China shale gas and shale oil plays

China potentially has the largest shale gas resource in the world. Tectonic and depositional settings and geomechanics regime of China shales are more complex than those of the producing marine shales in North America for shale resource assessment, exploration, reservoir characterization and hydraulic fracturing. Understanding China shale geology, shale resource potentials and reservoir characteristics is crucial in sweet spot identification, hydraulic fracturing optimization, and reservoir performance prediction.

The editors of *Interpretation* ([www.seg.org/interpretation](http://www.seg.org/interpretation)) invite papers on the topic **China shale gas and shale oil plays** for publication in a May 2015 special section to supplement the journal's regular technical papers on various subject areas.

Contributions spanning multidisciplines are invited. They include, but are not limited to, the following topics:

- Regional geology of China shales
- China shale gas and shale oil resource assessment
- Integrated multidisciplinary (geology, geophysics, geochemistry, petrophysics, and geomechanics) characterization of China shale reservoirs
- Case studies of shale gas and shale oil exploration and development
- Marine, lacustrine, and transitional shale



*Interpretation*, copublished by SEG and AAPG, aims to advance the practice of subsurface interpretation.

The submissions will be processed according to the following timeline:

Submission deadline:  
**1 August 2014**

Publication of issue:  
**May 2015**

Special section editors:

**Shu Jiang**  
[sjiang@egi.utah.edu](mailto:sjiang@egi.utah.edu)

**Hongliu Zeng**  
[hongliu.zeng@beg.utexas.edu](mailto:hongliu.zeng@beg.utexas.edu)

**Jinchuan Zhang**  
[zhangjc@cugb.edu.cn](mailto:zhangjc@cugb.edu.cn)

**Neil Fishman**  
[nfishman@hess.com](mailto:nfishman@hess.com)

**Baojun Bai**  
[baib@mst.edu](mailto:baib@mst.edu)

**Xianming Xiao**  
[xmxiao@gig.ac.cn](mailto:xmxiao@gig.ac.cn)

**Tongwei Zhang**  
[tongwei.zhang@beg.utexas.edu](mailto:tongwei.zhang@beg.utexas.edu)

**Geoffrey Ellis**  
[gellis@usgs.gov](mailto:gellis@usgs.gov)

**Xinjing Li**  
[xinjingli@petrochina.com.cn](mailto:xinjingli@petrochina.com.cn)

**Bryony Richards-McClung**  
[brmccclung@egi.utah.edu](mailto:brmccclung@egi.utah.edu)

**Dongsheng Cai**  
[caidsh@cnooc.com.cn](mailto:caidsh@cnooc.com.cn)

**Yongsheng Ma**  
[yongshma@126.com](mailto:yongshma@126.com)



# House GOP Wants More Transparency in Science

By EDITH ALLISON, GEO-DC Director

**C**ongressional Republicans want greater public access to scientific data used as a basis for determining the need for air pollution regulations.

Some call it appropriate – and needed – scientific transparency, while others note that publishing data such as individual patient's medical records is against the law.

Looking across the entire government, more data than ever is publically available.

\* \* \*

The Environmental Subcommittee of the House Science, Space and Technology Committee, at a Feb. 11 hearing, looked at "secret science" at the Environmental Protection Agency (EPA).

SST chair Lamar Smith (R-Texas) explained the hearing intended to get information regarding the proposed bill, H.R. 4012, the Secret Science Reform Act of 2014. The proposed legislation grew out of unsuccessful attempts by the committee to gain raw patient data from health studies conducted in the 1980s.

The studies are part of the scientific justification for various rules implemented by EPA under the Clean Air Act.

Smith's underlying goal is to limit the application of the Clean Air Act; the recent draft rule limiting CO<sub>2</sub> emissions from new power plants is based on EPA's responsibilities under the act.

H.R. 4012 would require that the EPA not issue any rules or regulations unless all scientific and technical information used to



ALLISON

support the action is publically available in a format that would allow "independent analysis and substantial reproduction of research results."

Bill proponents say the legislation will make EPA's science more transparent and

accessible to the masses.

Opponents, however, say the bill would bar EPA from using the best available science to inform regulations, because EPA cannot release certain data including patients' medical records.

\* \* \*

The background history is interesting, if obtuse: In August 2013 Smith issued a subpoena for EPA data from the Harvard Six Cities study – a 1974-92 monitoring of over 8,000 individuals that assessed the relationship between particulate pollution and mortality – and from the American Cancer Society's 1982-2004 Cancer Prevention Study II.

EPA has not provided what Smith considers adequate data – the individual health records. Sen. David Vitter (R-La.), ranking member on the Senate Committee on Environment and Public Works, has been waging a coordinated fight for the data.

The testimony and discussion during the hearing focused on several different topics:

▶ The high cost to industry of EPA regulations.

▶ The pros and cons of increased access to EPA data.

▶ How to assure patient confidentiality in reviewing raw data from epidemiological studies.

▶ **Raymond J. Keating**, chief economist at the Small Business and Entrepreneurship Council, quoted reports that show the cost to Americans of complying with government regulations exceeded over \$1 trillion in 2012.

▶ **John D. Graham**, dean of the School of Public and Environmental Affairs at Indiana University, testified "a series of reports from the National Research Council/ National Academy of Sciences over the last 15 years has documented persistent shortcomings in the quality, transparency and reproducibility of the [EPA's] agency's scientific determinations."

▶ **Louis Anthony Cox Jr.**, chief sciences officer, Next Health Technologies; clinical professor-biostatistics and informatics at the Colorado Health Sciences Center; and president, Cox Associates, summed up the arguments around open access to data: Independent analysis of raw data is important to assure the study conclusions are sound. The arguments against releasing raw data are the data could be used by

unscrupulous parties to manufacture doubt or release of the information could threaten the privacy of the study population.

▶ **Ellen Kovner Silbergeld**, professor at the Johns Hopkins Bloomberg School of Public Health, made the point that for scientific studies you want to see the work validated by independent studies; reassessing the data of published studies is less beneficial because the peer review process generally assures the data has not been misinterpreted.

The Natural Resources Defense Council sent a letter to the House committee opposing the draft legislation on the basis that, while restricting the information EPA can use in developing regulations, another section of the bill shields industry from releasing data used for pesticide registrations, certification of vehicle emissions and other filings to EPA.

\* \* \*

The federal government already has taken steps to make scientific data more accessible or transparent.

EPA's existing scientific integrity policy:

✓ Prohibits all EPA employees from suppressing, altering or otherwise impeding the timely release of scientific findings or conclusions.

✓ States the expectation that the

**Continued on next page**

## IQ Earth Forum Effective Interpretation for Conventional and Unconventional Reservoirs



Society of Exploration Geophysicists  
The international society of applied geophysics

**IQ Earth**  
quantitative subsurface  
integration

**1-5 June 2014**  
**Galveston, Texas**

For more information, visit:  
[www.seg.org/meetings/iqforum](http://www.seg.org/meetings/iqforum)

## SAVE THE DATE

**Marcellus and Utica Point  
Pleasant Geosciences  
Technology Workshop**  
June 17-19 • Pittsburgh

Two of the top unconventional plays just keep getting stronger. Learn why they are successful, and how to optimize exploration and development

- New approaches for sweet spot identification
- Seismic techniques
- Frac techniques that work
- Well spacing / frac spacing
- Reservoir characterization
- Reservoir quality determination
- Current research initiatives



[www.aapg.org/career/training/in-person/workshops](http://www.aapg.org/career/training/in-person/workshops)



**AAPG**

Geosciences Technology  
Workshops 2014



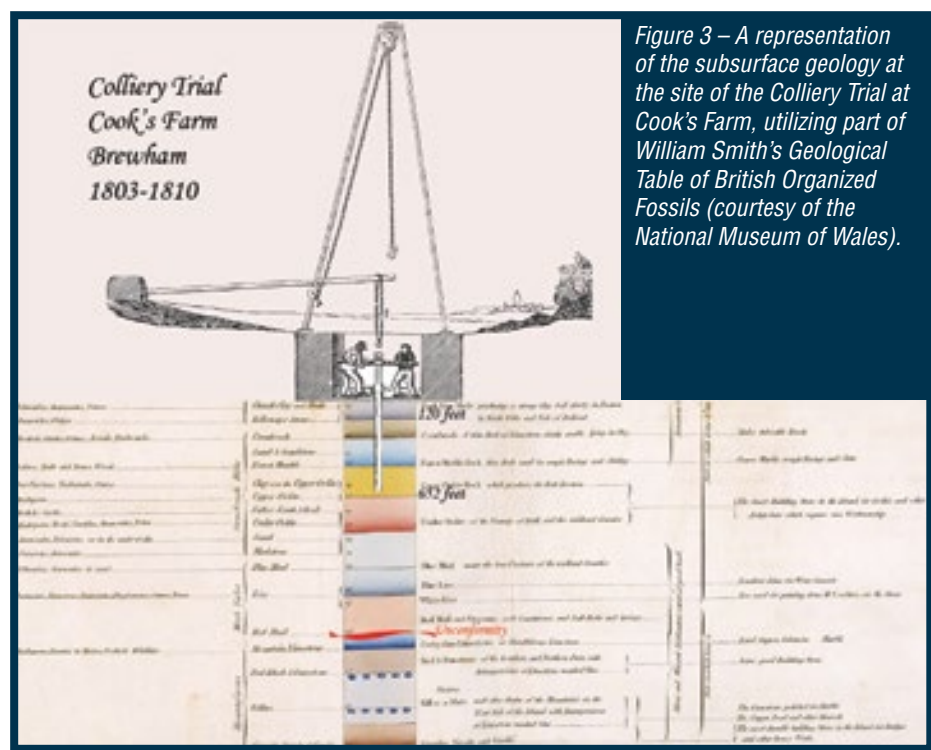


Figure 3 – A representation of the subsurface geology at the site of the Colliery Trial at Cook's Farm, utilizing part of William Smith's Geological Table of British Organized Fossils (courtesy of the National Museum of Wales).

## Cook's Farm from page 69

part of a campaign to search for onshore oil and gas in the 1980s, a long seismic line (CV80-082) was acquired, which runs close to the Cook Farm trial site. This line is located on Smith's map and the seismic section projected along the line (figure 2).

The section clearly shows reflectors dipping to the south off the high.

Although Smith would have been unaware of the high, he did actually map an outcrop near the base of his Blue Lias, near Sparkford, that coincides with a prominent outcropping Rhaetic reflector located at the western end of the high.

To the northeast, younger beds are seen to drape over older Palaeozoic reflectors. The Bruton-1 stratigraphic borehole (four miles southwest of Cook's Farm), encountered a Jurassic sequence beginning in the Fuller's Earth Rock and extending downwards through the Inferior Oolite and Liassic and Triassic, the latter unconformably overlying Carboniferous Limestone at a depth of 962 feet. This compares with Carboniferous Limestone at 3,250 feet at Fifehead Magdalen-1, which is situated to the south in the Mere basin.

Near Norton Ferris-1 the seismic section


shows evidence of possible strike-slip faulting. Toward the end of the seismic section, basal Chalk and Greensand reflectors are seen to unconformably overly upper Jurassic sediments.

\* \* \*

A representation of the Cook's Farm coal trial is shown in figure 3, using part of Smith's Geological Table of 1817. The trial was spudded in the Clunch (Oxford) Clay and eventually reached a total depth of 652 feet in the Great Oolite.

It is now known that there was never any possibility of coal being encountered since there is almost certainly an unconformity between Smith's Red Ground (Triassic) and his Mountain (Carboniferous) Limestone.

Coincidentally, some 180 years later and only three miles east of Cook's Farm, Norton Ferris-1 (Carless Exploration) was drilled to test for oil. The primary reservoirs were thought to be the Upper Liassic Midford Sands, and other sandstones within the Rhaetic. Secondary objectives were Carboniferous Walsortian Reef limestone and Devonian sandstone.

The Midford Sands were encountered but showed no trace of oil; both the Triassic (Sherwood) sandstone and the Carboniferous Limestone were absent. 

**Hugh Torrens** is emeritus professor of history of science and technology at Keele University, Newcastle-under-Lyme, England. He studied geology at the universities of Oxford, Leicester and Palermo. He retired in 2000 and in 2012 was received the inaugural Vladimir V. Tikhomirov History of Geology award by the International Union of Geological Sciences.

**Peter Wigley** is a Cornishman who worked on numerous geological projects in the North Sea, Africa, the Mediterranean, China and the Middle East. In 1995 he joined Lynx Information Systems, a company he jointly founded and is currently a non-executive director of the company. He is a board member of AAPG-Datapages and the director of the Datapages DEO-GIS Project.


## Continued from previous page

agency will continue to expand and promote access to scientific information by making it available online in open formats in a timely manner – including access to data and non-proprietary models underlying agency policy decisions.

These policies reflect government-wide procedures issued by the Office of Management and Budget (OMB). Among other requirements, OMB requires that all data produced under a government grant or award be available using a Freedom of Information Act (FOIA) request.

Unfortunately, FOIA requests may be complicated, time consuming and frequently unsuccessful.

In 2009 the federal government initiated policies to make government information and data easily accessible to the public. The outgrowth of this policy is DATA.GOV, the federal government website, which contains about 90,000 datasets including non-federal data that may have licensing restrictions.

Unfortunately, the data sets are not easy to search, and lack explanatory information. 




# 2014 ANNUAL CONFERENCE

## 11-14 May • Midland, TX



## OLD BASINS – NEW IDEAS

### Exploiting the Resource, Reaping the Rewards

## LUNCHEONS

**Monday - 12th**

**All-Convention Lunch**



**Patrick Dearen**  
"From the Middle Concho to Horsehead Crossing: The Old West's Skeleton Plain"

**Tuesday - 13th**

**DPA Ethics Lunch**

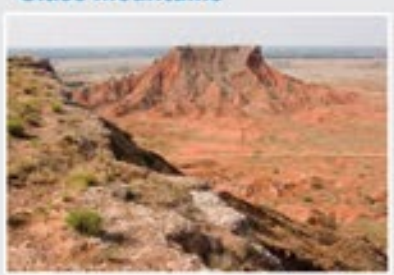


**Dr. Rusty Riese**  
"Climate Change"

## FIELD TRIPS

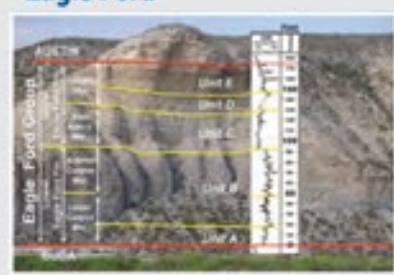
**8 - 11 May, 2014**

**Glass Mountains**



**14 - 17 May, 2014**

**Eagle Ford**



Visit our website and register now: [southwestsection.org](http://southwestsection.org)



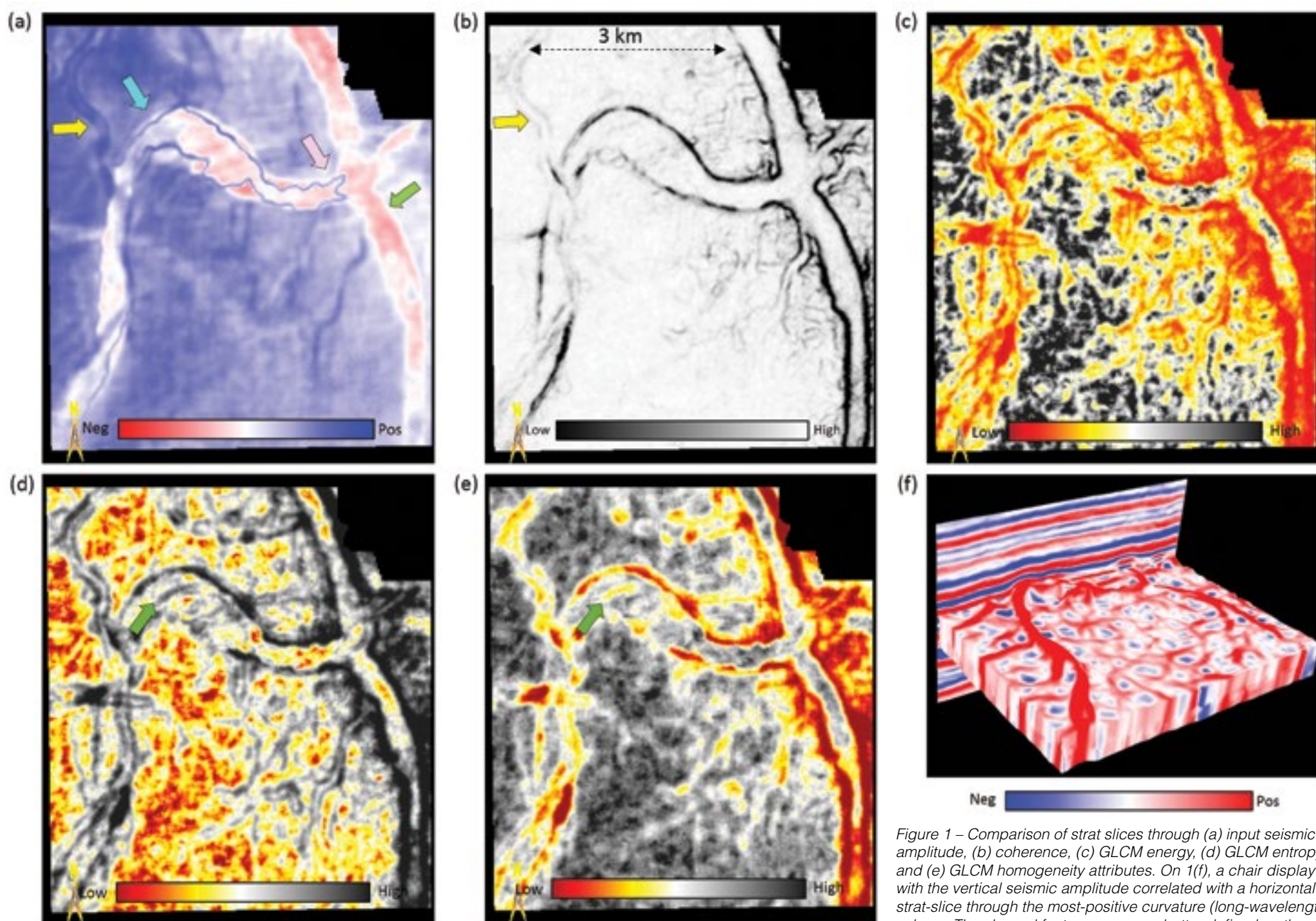


Figure 1 – Comparison of strat slices through (a) input seismic amplitude, (b) coherence, (c) GLCM energy, (d) GLCM entropy and (e) GLCM homogeneity attributes. On 1(f), a chair display with the vertical seismic amplitude correlated with a horizontal strat-slice through the most-positive curvature (long-wavelength) volume. The channel features are seen better defined on the texture attribute displays than the seismic display.

# Extracting Information From Texture Attributes

By SATINDER CHOPRA and KURT J. MARFURT

There are a number of seismic attributes that are derived from seismic amplitudes to facilitate the interpretation of geologic structure, stratigraphy and rock/pore fluid properties.

▶ The earliest attributes were extracted by treating seismic amplitudes as analytic signals for aiding feature identification and interpretation.

As the computation of these attributes is carried out at each sample of the seismic trace, they are referred to as instantaneous attributes.

▶ This development was followed by attributes that are derived by transforming seismic amplitudes into impedance or velocity.

Also called seismic impedance inversion attributes, these attributes yield lithology or fluid information that can be calibrated with well logs.

▶ A third class of attributes quantifies the lateral changes in waveform using an ensemble of windowed traces in the inline and crossline directions.

Such geometric attributes include dip, coherence and curvature, and are routinely used to accelerate and quantify the interpretation of faults, fractures and folds from 3-D seismic data.

▶ While texture attributes are less familiar to seismic interpreters, seismic texture forms the basis of seismic stratigraphy, giving rise to descriptions of "concordant," "blocky," "hummocky" and "chaotic" pictures.

Quantitative texture analysis is one of the primary tools in remote sensing of forestry, agriculture and urban planning.

The classic definition of texture defines a window, such as the human thumb, sampling subtle changes in elevation. Rubbing your thumb across nearby surfaces may give rise to textures you may describe as smooth, rough, silky, corrugated, wavy or chaotic.

Most people can easily recognize pine, oak, maple, ash, mahogany, teak and many other woods from their grain, but may have difficulty explaining how they are able to distinguish them.

For this reason, it is difficult to teach a computer to recognize such patterns.

Most remote sensing and industrial applications use statistical measures of the gray-level co-occurrence matrix, or GLCM, which measures the repetition of a pattern from point-to-point.

Thus a "brick pattern" in North America



CHOPRA



MARFURT

would have mortar every 12 inches horizontally and four inches vertically.

GLCM seismic analysis might search for vertical patterns such as onlap, frequency and parallelism.

\* \* \*

In this article we search for lateral patterns in the seismic data along structural dip.

We find three texture attributes to be the most useful in extracting lateral changes in reflectivity. They are:

- ▶ GLCM energy.
- ▶ GLCM entropy.
- ▶ GLCM homogeneity.

Somewhat confusingly, the GLCM energy is a measure of the energy of the GLCM matrix and not of the seismic data itself.

For this reason, a checkerboard pattern, which has many adjacent red and black pixels, will have high GLCM energy, high homogeneity and low entropy. A smooth pattern will have high homogeneity, moderate energy and low entropy.

We illustrate the application of these texture attributes and their usefulness on an

area in south central Alberta, Canada.

In figure 1a we see a strat slice through a seismic volume showing some Mannville channels. Not all these channels are incised, as the main channel on the left (blue arrow) is seen to have a signature somewhat different from the channel seen to the right and indicated with a green arrow. This is because of the greater measure of differential compaction noticed on the curvature strat slice (shown in figure 1f), and described in the July 2012 Geophysical Corner.

This main channel is seen to have a definite outline in blue on the seismic display, and at the location of the pink arrow it merges with the vertical channel to the right (green arrow), which appears to have undergone lesser differential compaction.

A thin vertical channel seen on the seismic amplitude display in figure 1a (yellow arrow) is seen with a better definition on the coherence.

While coherence shows the edges of the channel, it gives little indication of the heterogeneity or uniformity of the channel fill. Notice the clear definition of this channel on the three texture attributes shown in figures 1c-e, especially the complete thin high entropy, low homogeneity N-S running channel seen in figures 1d and e.

We interpret a similar high entropy,

**Continued on next page**







# Canadian YPs Bring FOCUS to GeoConvention

By RYAN LEMISKI and MARC ENTER

And now for something completely different ... This May, the AAPG Canada Region Young Professionals Committee will be co-hosting a YP/ student-focused session with the Canadian Society of Petroleum Geologists (CSPG) and the Canadian Society of Exploration Geophysicists (CSEG) at GeoConvention 2014 in Calgary, Canada.

The GeoConvention theme is "FOCUS," and for the very first time GeoConvention will put that focus on its young members during a forum titled "On Belay – FOCUSing on the Climb That is a Career in Geoscience."

On Belay will consist of two components:

- ✓ A morning session with presentations from senior Canadian energy industry professionals – many of who are AAPG, CSPG and CSEG leaders.

- ✓ An afternoon session where young professionals from across the country will take the stage.

If you are a student or a professional just beginning a career in geoscience, this is not to be missed!

The concept for this session was inspired by and based on conversations with the students and YPs – presentations will be tailored to answer the common questions these demographics have about the industry while at the same time providing insight for senior professionals on the mindset the next generation has regarding their industry.



LEMISKI

**Presentations will be tailored to answer the common questions YPs have about the industry – and allow senior professionals to discover YP mindsets about their industry.**

Some of the questions include:

- ▶ What are the energy industry's current and future technical requirements?

- ▶ What steps can I take to gain employment in the competitive Canadian job environment?

- ▶ Where/how do I fit in with a professional society?

- ▶ Is active membership in a professional society beneficial to my

current and future success?

- ▶ What are human resources (HR) – and what does HR really look for in a résumé?

- ▶ What can I expect in my first few years of work in the energy industry?

- ▶ How important is a network? How does one network?

\* \* \*

On Belay's morning talks will provide

The annual YP "Meet-n-Greet," a popular networking opportunity that has become a highlight of AAPG annual conventions, will be held 2-3:00 p.m. Sunday, April 6, at Houston's George R. Brown Convention Center.

The event is held just prior to the start of official ACE activities, serving as a lead-in to attending the opening session.

AAPG's Young Professionals Committee oversees this event, pairing students and young professionals with experienced AAPG attendees who then

guide newcomers through the convention experience.

It works like this: Students and YPs are paired with experienced professionals who then serve as their host/guide for the opening session and subsequent Icebreaker reception in the exhibition hall, introducing them to other AAPG members and their colleagues.

The networking potential is huge.

Interested? Simply indicate your interest during the registration process.



ENTER

students and young professionals the opportunity to hear from an experienced multidisciplinary panel of speakers that represent all geoscience organizations in Canada.

They include:

- ▶ **Ron Bailey** – Senior vice president-gas and tight oil, Nexen Energy ULC, who will discuss his career path and one of the hot

topics in the Canadian energy industry – liquefied natural gas (LNG) – including a glimpse at Nexen Energy's LNG strategy and what LNG may mean for the future of Canada.

- ▶ **Dale Leckie** – CSPG president, Nexen Energy ULC.

- ▶ **Ron Larson** – CSEG president, RPS Boyd PetroSearch, who will present his thoughts on industry cycles, emerging economies, the technical skills required in the pursuit of tight and self-sourced hydrocarbons and finally, environmental stewardship.

- ▶ **Tom Sneddon** – APEGA director of geoscience and outreach, who will talk on the importance of professionalism.

- ▶ **Astrid Arts** – CSPG finance director-elect, Cenovus Energy, who will provide "A

**Continued on next page**

# 2014 PROFESSORIAL AWARD & TEACHER OF THE YEAR

## Robert Goldstein

**2014 Professorial Award Recipient**

Associate Dean – Natural Sciences and Mathematics  
Haas Distinguished Professor –  
Department of Geology  
University of Kansas

*"I've been a geology professor at the University of Kansas for 29 years, and I truly love teaching at all levels, from Introduction to Geology to AAPG field seminars.*

*For me, teaching in the geosciences is all about helping students to think and see; it is incredibly rewarding work."*

Goldstein will receive his award at the AAPG Foundation Chairman's Reception at ACE, Tuesday, April 8, Houston



## Heather McArdle

**2014 Teacher of the Year**

Geosciences Teacher  
Mahopac High School  
Mahopac, NY

*"I am tremendously excited and honored to have been recognized by the AAPG Foundation for such a distinguished award. Recognition for my work in creation of a dual-enrollment physical geology course has bolstered my enthusiasm and drive to continue to promote the geosciences in New York state."*

McArdle will receive her award at the ACE All-Convention Luncheon, Monday, April 7, Houston



AAPG Foundation • P.O. Box 979 • Tulsa, OK 74101-0979 USA Direct Line: 918-560-2644 • FAX: 918-560-2642

Toll-Free Number (US and Canada): 855-302-2743 Email: [foundation@aapg.org](mailto:foundation@aapg.org) • [foundation.aapg.org](http://foundation.aapg.org)





## GEO 2014 – Success in Bahrain



The recent GEO 2014 proved to be a tremendous success in terms of both quality and quantity. Above, distinguished panelists for the GEO 2014 opening plenary session, "Taking Geoscience Beyond the Conventional" – (from left) Nima Abu-Wardeh, moderator; Matthias Bichsel, director Projects and Technology, Royal Dutch Shell; Amin Nasser, senior vice president-Upstream Operations, Saudi Aramco; Paal Kibsgaard, chief executive officer, Schlumberger.



The Middle East Region's IBA-winning team poses with GEO 2014 General Chair Ibraheem Assa'adan (second row, fourth from left) and other distinguished guests – including (second row, center) AAPG President-Elect Randi Martinsen and Executive Director David Curtiss.

### Continued from previous page

Girl's Guide to The Oil Patch."

► **Holly Ivanko and Nancy Eaton-Doke** – campus recruitment, Nexen Energy ULC, will provide resume tips and shed light on the important considerations students should make when applying for a job.

The afternoon talks will highlight six young professionals – YPs who will discuss their experience working in the energy industry, training programs at large companies, comparisons and contrasts in E&P and service companies, touch on the finer points of networking and inform students on what they can expect as they transition (or "bridge") from student to YP.

The YP speakers include:

- **Jesse Schoengut** – Canadian Natural Resources Ltd.
  - **Frank Ryan** – Chevron.
  - **Tiffany Yaxley** – Roke Technologies Ltd.
  - **Marc Enter** – SGS Canada Inc.
  - **Ryan Lemiski** – Nexen Energy ULC.
  - **Greg Baniak** – BP Canada
- Please note these talks are not solely

for the benefit of YPs and students. Senior geoscience colleagues are encouraged to attend and be part of a dialogue on some of the important issues facing YPs and students.

(Only by engaging our senior colleagues can we begin to address concerns such as the impending "great crew change" and how to properly capture the wealth of knowledge and experience of the individuals that have worked in this industry for 30-plus years.)

\* \* \*

On Belay's program has something for everyone, and it highlights growing collaboration among AAPG, CSPG and CSEG. Presentations will provide a perspective on the different benefits professional organizations offer their members – and evidence that being an active member can lead to a large support network and a long successful career in geoscience.

We hope to see you at GeoConvention! 📅

### IN MEMORY

**George W. Bayne**, 90  
Grand Junction, Colo.  
Jan. 25, 2014

**Kirby Lee Cockerham Jr.**, 87  
Greenwood Village, Colo.  
Jan. 27, 2014

**Bruce Edward Gaither** (Member 1975)  
Cedar Crest, N.M.

**Gerard Julian Genik**, 85  
Sidney, Canada, July 26, 2013

**Henry Walround**, 90  
Bakersfield, Calif., Feb. 21, 2014

(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.)



## SAVE THE DATE

**AAPG/MGS Conference in Yangon, 14-15 August 2014**  
"Tectonic Evolution of Myanmar and its Basin Development with Special References to its Petroleum Occurrences"

AAPG and the Myanmar Geosciences Society will jointly present a Conference in Yangon. Sessions - preliminarily including Basins of the Bay of Bengal, Onshore Myanmar, and Basins of the Andaman Sea - will explain the development of area basins that have led to a number of petroleum systems: from the oil-rich Central Burma Basin, to the biogenic gas of the Rakhine Basin, and the wet gas of the Moattama Basin. Confirmed Keynote addresses will be presented by Professor Ian Metcalfe of the University of New England, Australia; Dr Claude Rangin of Nice University, France; U Win Swe, Patron of the Myanmar Geosciences Society and a speaker from Myanmar Oil & Gas Enterprise, Myanmar. Interested Authors should send a 50-line abstract and a 3-paragraph CV to Adrienne Pereira before 30 April 2014.

To improve your understanding of Myanmar tectonic history and basin development, plan to register for this first AAPG joint Conference. This conference is perfect for structural geologists and explorationists seeking to develop a broader and deeper understanding of Myanmar geology and its impact on the distribution of hydrocarbons. A 3-day field trip will be run independently by the Myanmar Geosciences Society to the Central Burma Basin on the weekend immediately following the Conference.

Sponsorship Opportunities are available to promote your corporate image. Information can be obtained from:

**Martin Bowden**  
Project Development Manager, S & S E Asia  
TGS  
Email: martin.bowden@tgs.com  
Mobile +65-92997359

**Adrienne Pereira**  
Programs Manager  
AAPG Asia Pacific Office  
apereira@aapg.org  
Tel: +65-96536728



### THE NIGERIAN ASSOCIATION OF PETROLEUM EXPLORATIONISTS (NAPE)

47A, Femi Okunnu Housing Estate, Lekki Peninsula, Lagos.

P.M.B. 12598, Marina, Lagos - Nigeria

TEL: +234 1-3429082, E-mail: info@nape.org.ng | Website: www.nape.org.ng

### 32ND ANNUAL INTERNATIONAL CONFERENCE & EXHIBITION

#### THEME

"The Future of Hydrocarbon Exploration:  
Drilling Deeper, Searching Wider."

#### Call for Abstracts

Industry professionals, allied services companies and students are invited to submit abstracts online to the NAPE 2014 International Conference & Exhibition (ICE), to be held 9 - 13 November, 2014 at the Eko Hotel & Suites, Victoria Island, Lagos, Nigeria.

The Technical Program Committee encourages abstracts that relate to any of the topics listed below. Final sessions and formats (oral and posters) are determined by actual submissions.

#### Sub-themes

1. PLAY DIVERSITY, CHARACTERIZATION AND OPERATIONAL CHALLENGES OF HPHT AND DEEP PLAYS
2. FRONTIER EXPLORATION AND ANALOGUES: GULF OF GUINEA AND WEST AFRICA TRANSFORM MARGIN BASINS
3. EMERGING TECHNOLOGIES AND COMMERCIALIZATION STRATEGIES FOR DEEP-WATER PLAYS
4. SEARCHING WIDER AND PORTFOLIO GROWTH: NEW EXPLORATION TARGETS IN BROWN FIELD CONVENTIONAL PLAY
5. PORTFOLIO GROWTH AND DIVERSIFICATION - HYDROCARBON POTENTIAL OF INLAND BASINS AND EXPLORATION STRATEGIES
6. TECHNOLOGY, SAFETY, ENVIRONMENT AND SECURITY CHALLENGES IN HYDROCARBON EXPLORATION

**Submit now! Don't miss an opportunity to present a paper (oral or poster).**

See the NAPE Conference website: [nape.org.ng/conference](http://nape.org.ng/conference)  
for abstract guidelines and theme sub-categories.

■ **DATE:** 9 - 13 November, 2014 ■ **VENUE:** Eko Hotel & Suites, Lagos.

**Adedola Ojelabi**  
President  
email: president@nape.org.ng


**Chikwendu Edoziem, fnape**  
President-Elect & Chair  
NAPE CONTINUING EDUCATION 2014  
email: president-elect@nape.org.ng

**Irewole Ayodele**  
Publicity Secretary  
email: publicitysecretary@nape.org.ng

[www.nape.org.ng](http://www.nape.org.ng)

**NAPE... Our ideas find oil & Gas**






## RMAG/PTTC GEOSTEERING FORUM

IMPACTING THE BOTTOM LINE

TUESDAY, APRIL 29<sup>th</sup>, 2014



Presentations highlight the latest techniques, applications and software being utilized to geosteer horizontal wells in a variety of basins and formations. The Forum includes premier exhibitors. The exposure to the experts and service providers in this one day event will be tremendous and not to be missed by anyone involved in horizontal wells.


- **Keynote Luncheon - Reliable Geosteering Methods in the Middle Bakken and Three Forks: Case Studies in Minimizing Error**, Williston Basin, Emily Brehm\* and Jason Harms\*, WPX Energy
- **Horizontal Well Planning & Guidance From Within an Integrated Geological/Geophysical Model**, DJ Basin, Bill Lyons\*, Anadarko Petroleum Corp
- **Unconventional Resource Evaluation and Exploitation - A Practical Approach**, Fort Worth Basin, Fred B. Poland\*, LMK Resources,
- **RigComms: Introducing a New and Powerful Geosteering Software**, Iain Wilson\* and Dr. Susan Bruce, GeoSteering LLC
- **Assessing Uncertainty in Geologic Data: Implications for Well Planning and Geosteering in the Bakken Petroleum System and Beyond**, Williston Basin, Michael Madison\* and Michael Hillix, Kodiak Oil and Gas Corp
- **Using Remote 4D Geosteering Systems to Drill Better Horizontals**, Marcellus Shale, Rocky Mottahedeh\*, United Oil & Gas Consulting Ltd and Jebb Rosenberger, Stone Energy
- **The Art and Science of Geosteering**, Oklahoma, Tom Arnold, Paladin Geological Services
- **Inspiration, Innovation and Mortal Legal Combat: A Story of Geosteering Technology Development**, Tim Dean, Terra Domain Corp
- **3D Seismic Proves its Value in Bakken Geosteering**, Williston Basin, Angie Southcott\* and Hal Harper, WPX Energy
- **Navigating those Bumps in the Road in Drilling a Perfect Horizontal Well**, Rockies/Canada, KC Oren, Horizontal Solutions International
- **An Integrated and Automated Approach to Well Design and Geosteering**, Woodford Shale, Dave Phillips, Schlumberger Software Petrel

Target Audience: geoscientists, drilling engineers, and reservoir engineers

REGISTRATION - \$200 member, \$250 nonmember

**Marriott Denver City Center Downtown Denver, CO**

To Register visit [WWW.RMAG.ORG](http://WWW.RMAG.ORG) or contact the RMAG office [staff@rmag.org](mailto:staff@rmag.org) 303-573-8621



## AAPG FORUM

### Woodford Shale Forum

May 29 – Oklahoma City, Oklahoma

Join us for an intensive one-day forum which will focus on optimizing the exploration and development of the Woodford Shale. New developments and understandings in many new areas will be featured:

- Sweet spot determination (seismic, geochemistry, biostratigraphy, sequence stratigraphy)
- Producibility determinants
- Well spacing / Hydraulic Fracturing spacing
- Variations in drilling and completion techniques across the Woodford
- Fractures: natural and induced
- Reservoir quality
- Current research initiatives

[www.aapg.org/career/training/in-person/forums](http://www.aapg.org/career/training/in-person/forums)



The AAPG Foundation's Teacher of the Year Heather McArdle (right), with her most recent class of college physical geology students on their final field trip of the year.

## Making science relevant

# McArdle's Creative Touch

By SUSIE MOORE, Communications Project Specialist

"I want my students to be scientifically literate in the geosciences, and be able to rely upon facts and the scientific method for decision making – no matter their career path."

Spoken like a dedicated classroom teacher. Spoken, in fact, by Heather McArdle, this year's winner of the AAPG Foundation Excellence in Teaching Award (Earth Sciences Teacher of the Year).

McArdle, already an award-winning geosciences teacher at Mahopac High School in Mahopac, N.Y., has been described as "incredibly creative," "a dedicated classroom teacher" and "capable of teaching earth science effectively at all levels."

She also is author of three published geoscience lab manuals and creator of Living the Earth Sciences Web page.

The honor McArdle will receive from the AAPG Foundation comes with a \$6,000 prize to be split between McArdle and Mahopac High School. She also will receive an expense-paid trip to the AAPG Annual Convention and Exhibition in Houston April 6-9, where she will be presented her award at the All-Convention Luncheon.

Throughout her 17 years of teaching high school and college-age students in fields of geoscience, she has found her students are very interested in science.

"They are curious," she said, "they have loads of questions."

"Few teenagers are aware of their individual impact on society," she added, "and as consumers, their economic choices are modified with improved awareness."

McArdle uses current events to engage her students and make science important and relevant in their everyday life, and said, "This is by far the easiest of my goals."

"Headlines, economic impacts on the job market, town hall meetings for local discussions on hydraulic fracturing, the resources needed for each student to recharge their technological devices," she said, "everything comes back to geology and economics."

"Geology's relevance is evident all around us," she added. "I act as the facilitator of drawing the student's attention to that evidence."

### Making the Difference

McArdle previously received a National Science Teacher Association award for excellence in inquiry-based science teaching in 2010 – the only high school

teacher in the country to be so recognized.

"Inquiry-based, hands-on experiential activities are those that I've found to be the most impactful," McArdle said. "Not only do they tend to keep the students motivated to learn, but these automatically require higher-level critical thinking skills."

McArdle's interest in the science was peaked with her first course in geology at her public high school. She admitted this was the point when she knew her career path would involve the geosciences.

"My geology teacher in high school perhaps made the earliest and greatest impression," she said, speaking of Jeff Callister. "He was, and still is, a dynamic, one-of-a-kind teacher who absolutely loves his subject. I have found one of the nicest, greatest things that can be said to, and of, a teacher is their impact on others."

"(He) made a difference," she said, "not just for me, but in turn for all the students I teach today."

McArdle went on to secure a Bachelor of Science dual degree in geology and secondary science education from SUNY Oneonta, and a master's degree with an emphasis in secondary science education from Syracuse University.

It was at The State University of New York, Oneonta, where she met and was educated in the geosciences by Jim Ebert.

"Jim is an excellent teacher and scientist," she said. "While a student of his I learned about geology, stratigraphy and the art of teaching."

"Mentors like Jim, Jeff and all the others who have provided me council throughout my professional life cannot be thanked enough," she added, "and their contributions cannot be overstated."

### The 'Whole Package'

McArdle's enthusiasm for teaching the geosciences in the classroom are evident.

Adam Pease, principal, of Mahopac High School said McArdle's classroom is filled with activity and positive energy.

"You will not help but notice her warm smile and charismatic personality," he said. "She values student participation and works diligently to make sure that students love science and learn to use it in their everyday life."

"As a teacher, Heather is the 'whole package,'" Pease said.

"(She) is the teacher whom you would want your child to have." ■



## Customize your online experience

# Bookmarks – A Handy Tool

By JANET BRISTER, AAPG Website Editor

**E**ver created a wish list on Amazon? Ever added a bookmark to your browser?

Do you organize your bookmarks by topic for ease of access?

With all the information that is being pushed our way, a good bookmark system goes a long way toward finding and reviewing information that matters to each of us.

That's a big reason why AAPG has provided site bookmarks.

When you access your profile on the new AAPG website you may have noticed the bookmark feature under "Actions." It has an icon that looks like a bookmark and it is labeled "My AAPG Bookmarks."

Yes, this is where your site bookmarks are stored and organized.

And we have some suggestions for how you can effectively populate these, making a visit to the AAPG website more satisfying.

### Saving an AAPG Bookmark

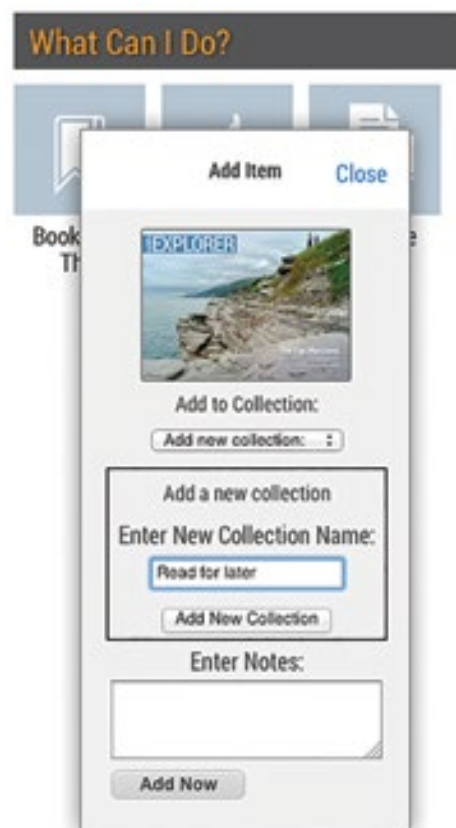
When the bookmark icon is displaying in the right-hand column of a Web page it will have the same graphic associated with it that you have on your profile. The label underneath, however, says "Bookmark This."

When you click on it you'll be prompted to "Add a new collection." Simply type in the name for your collection and click the "Add New Collection" button.

In the example we've provided, this button is on an EXPLORER article and the collection created is "Read for later."

If you have notes that you'd like to accompany your bookmark you can add these and then click the "Add Now" button – and now they'll be right where you need them.

Upon returning to the profile interface and clicking on the "My AAPG Bookmarks"



button you'll find listed there your collection – and from there the article you bookmarked.

This is a handy way to gather EXPLORER articles of interest to you.

Similarly you'll be able to bookmark training opportunities you might be attending.

Since our workshops and forums tend to go through stages of information provided, this is a handy way to quickly go to the updates you need each time you return to the AAPG website.

*Good browsing!*

Going to the AAPG Annual Convention and Exhibition in Houston this month?

So are we – and we'd love to meet you there.

The AAPG Web team will be part of displays and information offered at the AAPG Center in the exhibition hall, located near the medicine wagon – you'll know it when you see it!

Each morning and afternoon we'll be giving a presentation that features the new AAPG website and its tools – and show you how to have an effective and stress-free website experience when visiting us online.

Also, personnel will be onsite to answer your questions and help you set up your AAPG website profile.

### A Multi-Client Report Offering:

## MEXICO AND THE SOUTHERN RIM OF THE GULF OF MEXICO: GEOLOGICAL FRAMEWORK, BASINS, AND PETROLEUM SYSTEMS

*This 12 volume literature-synthesis report includes:*

- Structural, stratigraphic, and sedimentary basin framework
- A new plate tectonic reconstruction of Mexico and the Gulf of Mexico
- Integration of source rocks and reservoirs within the geological framework
- Petroleum developments and a catalog of 625 fields and 1400 exploration wells
- Annotated bibliography and keyword cross indices of 5300 references
- 74 map plates of regional geology, databases, paleogeography, and tectonics

Report provided as paper+DVD or DVD-only; GIS database add-on also available

**Blair & Associates LLC Boulder CO (303) 499-6005 tcblair@aol.com**

## Rose & Associates

Courses Consulting Software

### Risk Analysis, Prospect Evaluation & Exploration Economics

Houston:	April 21 – 25, 2014	Calgary:	May 12 – 16, 2014
	Sept 22 – 26, 2014		November 3 – 7, 2014
		Aberdeen:	October 13 – 17, 2014

### Unconventional Resource Assessment and Valuation

Houston:	June 2 – 5, 2014	Calgary:	June 16 – 19, 2014
	October 27 – 30, 2014		October 6 – 9, 2014
Denver:	July 21 – 24, 2014	Ok City:	August 4 – 7, 2014

### Evaluating Tight Oil and Gas Reservoirs

Houston:	May 5 – 8, 2014	Calgary:	May 19 – 22, 2014
	Sept 15 – 18, 2014	Denver:	Sept 29 – Oct 2, 2014

### Play-Based Exploration: Mapping, Volumetric and Risk Analysis

Houston:	November 3 – 5, 2014	Aberdeen:	October 6 – 8, 2014
----------	----------------------	-----------	---------------------

<http://www.roseassoc.com/instruction>

## Pushing the seismic limits by ...



... integrating potentials

Integrated Gravity/Magnetic Interpretation | Software | Consulting | Environmental  
USA | +1-713-893-3630 | Europe | +49-40-28 00 46-0 | [www.terrasysgeo.com](http://www.terrasysgeo.com)

**TERRASYS**  
GEOPHYSICS

[www.geo-india.com](http://www.geo-india.com)

# GEO India

**Conference theme:**  
Innovations in Geosciences  
on India's Energyscape

The 3rd South Asian Geosciences  
Conference and Exhibition

**Call for Abstracts**  
Submit online at:  
[geo-india.com](http://geo-india.com)  
**Deadline: 30 April 2014**

**Conference:**  
11-14 January 2015  
**Exhibition:**  
12-14 January 2015

**India Expo Centre and Mart**  
Greater Noida, New Delhi

Conference chaired by:



Organised by:





# Connect With the Foundation During ACE

By NATALIE ADAMS, AAPG Foundation Administrative Manager

The Annual Convention and Exhibition is always an exciting time for AAPG and for the AAPG Foundation – and if you're going to be joining us in Houston this month there are a number of opportunities to learn more about how the Foundation supports the geosciences.

Those would include:

► **The Foundation lounge** – Visit the Foundation staff in the AAPG Center on the exhibition floor – and while you're there, meet up with other Foundation supporters and pick up your "I support the AAPG Foundation" name badge ribbon.

There you also can peruse literature and posters on the programs supported by the Foundation, such as the Military Veteran's Scholarship, Grants-in-Aid, the Imperial Barrel Award and other important Foundation programs.

And have you been thinking about joining the Foundation Trustee Associates?

Today there are more than 280 Trustee Associates who play an important role in the development of the AAPG Foundation's financial resources, thereby dramatically accelerating our ability to support scientific educational programs.

Find out more at the Foundation lounge.

► **All-Convention Luncheon** – Held Monday, April 7, this will be your chance

to meet the AAPG Foundation's Teacher of the Year, Heather McArdle, who will receive her award and share a few comments with the crowd.

The AAPG Foundation proudly recognizes one teacher annually for his or her contributions to K-12 education.

Trustee Chair Jim Gibbs will introduce McArdle – and he'll also take a moment to highlight our newest fundraising initiative, the Military Veteran's Scholarship Program.

► **Members of the Corporation and**

**Trustee meetings** – It's always an honor to gather together some of the strongest supporters of the AAPG Foundation.

The Members of the Corporation is a dedicated group of men and women who provide the backbone for the Foundation's success – it was formed in 1986 to conduct educational, charitable and scientific activities related to or allied with the field of geology. The group's purposes include making contributions to organizations that support the Foundation's objectives; to conduct research; disseminate information; assist

in career guidance; assist schools; and provide scholarships, awards, fellowships and other kinds of support to further geological education.

► **House of Delegates meeting** – Trustee Chair Jim Gibbs will give his chairman's report Sunday, April 6, at the House of Delegates meeting.

Recognizing the amount of contributions made to the Foundation by so many faithful donors is important

**Continued on next page**

## Robert Goldstein Wins Foundation's Professorial Award

AAPG member Robert Goldstein, associate dean for the natural sciences and mathematics at the University of Kansas, has been named the winner of this year's AAPG Foundation Professorial Award.

The honor, determined by the AAPG Academic Liaison Committee and presented annually to a professor for "Excellence in the Teaching of Natural Resources in the Earth Sciences," comes with a \$1,000 prize from the AAPG Foundation.

Goldstein is the Haas Distinguished Professor in the school's Department of Geology, where he has been a faculty



GOLDSTEIN

member since 1985.

"I greatly appreciate receiving this award from the AAPG Foundation," Goldstein said. "The nomination from my students and recommendation of my colleagues means a great deal."

"This honor is even more meaningful because it comes from AAPG," he added, "an

organization that truly represents my interests and those of the students I teach."

Goldstein's research program integrates large-scale fieldwork in various areas around the world and microscopic and geochemical analyses of mineral

precipitates in pore systems of rocks. In particular, Goldstein has pioneered the fluid inclusion technique for determining the pressure, temperature and fluid chemistry of mineral precipitation.

"I truly love teaching at all levels, from Introduction to Geology to AAPG field seminars," Goldstein said. "For me, teaching in the geosciences is all about helping students to think and see; it is incredibly rewarding work."

He is the second person to receive the award; the 2013 inaugural winner was Grant Wach, petroleum geoscience professor at Dalhousie University, Nova Scotia, Canada.

An interview with Goldstein will be featured in the May EXPLORER. ■

# HELPING VETERANS ENTER THE GEOSCIENCES MILITARY VETERANS SCHOLARSHIP PROGRAM

**The Military Veteran's Scholarship Program** will provide financial aid to veterans seeking undergraduate and graduate degrees in the geosciences whose studies and/or research has application to the search for and development of petroleum. Veterans bring real world experiences, leadership skills and motivation that not only assures their educational success, but they can also be positive role-models and nurturers for their younger student peers.

## Contribute Today

Your donation will leave a lasting impact on veterans who share your passion for the geosciences.

*"As a veteran, I know firsthand the challenges associated with transitioning from the military to a career as a petroleum geoscientist. The AAPG Foundation's Military Veterans Scholarship seeks to make the transition a little easier, and to help meet our industry's future challenges by bringing these outstanding young men and women into our ranks."*

**Earl Wells**, Deepwater GOM/JI, ExxonMobil US Production



*"Military veterans have performed a priceless service to our country. The AAPG Foundation's Military Veterans Scholarship Program will help give them the support they need as they pursue their education in the geosciences. We will count ourselves fortunate as these talented men and women earn their degrees, enter our profession and contribute to finding, developing and producing the energy our world needs."*

**Dave Lawrence**, AAPG Foundation MVSP supporter



AAPG Foundation • P.O. Box 979 • Tulsa, OK 74101-0979 USA Direct Line: 918-560-2644 • FAX: 918-560-2642

Toll-Free Number (US and Canada): 855-302-2743 Email: [foundation@aapg.org](mailto:foundation@aapg.org) • [foundation.aapg.org](http://foundation.aapg.org)



## Foundation Contributions for February 2014

### General Fund

Russell James Alexander  
Harry Truman Angell  
John Avila  
Cecil O. Basenberg  
William Howard Bowie  
Philip Braithwaite  
Jeffrey C. Bulsa  
A.T. Carleton Jr.  
Marvin Paul Carlson  
John Ernest Chatfield  
Chevron Humankind  
*Matching gifts/Leon Gerlich and Robert Scamman*  
William Gregory Cox  
M.A. Custer  
Lawrence Harold Davis  
Andres Duarte V.  
James L. Eymann  
Troy Allen Freund  
Ronald Glenn Heck  
William A. Heck  
Brian Wilson Horn  
Dan Allen Hughes  
Glenden Fordice Johnson  
John M. Kapchinske  
Michael Alaetin Kasli Sr.  
Patrick F. Kelly  
Raphael V. Ketani  
Jonathan Mark Lester  
George Leonard Long  
Cody J. MacDonald  
Jay Glenn Marks  
Thomas R. Marshall Jr.  
*In memory of Ernest R. Bush*  
Richard Fastabend Meyer  
*In memory of Wallace Dewitt R.*  
Ed Charles Moritz  
National Fuel Gas Company Foundation  
*Matching gift/Jianli Yang*  
Hugh William Peace  
Elwin Merrill Peacock  
Bernard William Regel  
Chase Savage Reid  
Edward and Magdalena Reid  
Jeffrey Robert Reindl  
Walter Charles Riese  
Rhys David Schneider  
Jeffrey A. Smith  
*In memory of Charles John "Chip" Krohn*  
John S. and Katherine Pond Spaid  
Frederick Lee Stead  
*In memory of Betty L. Stead*  
Edward Bancroft Towne III  
Jennifer Turner  
John E Volkmer  
Stephen Edwin Wilson  
Jianli Yang

### Digital Products Fund University of Colorado

Michael Alaetin Kasli Sr.

### Distinguished Lecture Fund

Robbie Rice Gries

### Education Fund

James E. Brooks  
Samuel Cole Guy  
*In memory of James W. Milliken*  
Donald W. and Susan E. Lewis  
Bonnie Milne-Andrews and James Andrews  
*In memory of Pete "Genel" Cokinos*  
Edmund Gerald Wermund Jr.  
*In memory of Grover E. Murray*

### GIS-UDRIL Fund Colorado School of Mines

Marathon Oil Corporation

### Louisiana State University

Marathon Oil Corporation

### Montana State University

Marathon Oil Corporation

### University of Calgary

Marathon Oil Corporation

### Grants-in-Aid Fund

#### David W. Worthington Named Grant

David and Beverly Worthington  
Steven D. Mitchell

#### Harry and Joy Jamison Named Grant

Dale and Lesa Jamison  
*In memory of Joy Jamison*  
Daniel and Jeanne Jamison  
*In memory of Joy Jamison*  
David G. Jamison  
*In memory of Joy Jamison*

#### John and Erika Lockridge Named Grant

Clifford C. Clark

#### John D. "Jack" Edwards Memorial Grant

Clifford C. Clark

#### Norman H. Foster Memorial Grant

Clifford C. Clark

#### Robert K. Goldhammer Memorial Grant

Mark David Sonnenfeld  
*In memory of Robert K. Goldhammer*

### Imperial Barrel Award Fund

Shell Exploration and Production Company  
Arthur H. Johnson  
*Support for the Gulf Coast Region*

### Military Veterans Scholarship Fund

Frank J. Banar  
Dudley and Marian Bolyard  
*In memory of Kirby Cockerham*  
Leon Geddis Byerley Jr.  
Roland W. Doty Jr.  
*In memory of Kirby Cockerham*  
William E. Gipson  
*In memory of Frank Kell Cahoon and Howard Gould*  
Helen Catherine Hoggeboom  
*In memory of Kirby Cockerham*  
Michael Alaetin Kasli Sr.  
Wayne Lebsack  
George Raymond Macaulay Jr.  
*In memory of J.M. Henton*  
The Whyte, Ham, Babb, Leftwich and Mair Families  
*In memory of Kirby Cockerham*  
Hugh William Peace  
Walt and Jeanette Praetorius  
*In memory of Kirby Cockerham*  
Jackson R. Riley  
Sigmund J. Rosenfeld  
*In memory of G.W. "Wally" Bayne, Elliot Riggs and Robert N. Nanz Jr.*  
SM Energy  
*Matching gift/Richard D. Fritz*  
Paul Milton Strunk  
*In memory of Donald R. Boyd and in honor of Patricia Boyd*  
Glen Edward Vague Jr.

### John F. Bookout Jr. Military Veterans Scholarship Fund

Roxanna Foundation  
*Matching gift/Marlan and Marea Downey, in memory of Woody Nestvold*

### Named Public Service Fund Hugh Looney Excellence Fund

Alice and Mike Widmier  
*In memory of Hugh and Tillie Looney*

### The Gibbs Family Endowment Fund

James A. Gibbs

### Professorial Grants Fund

Michael Alaetin Kasli Sr.

## Continued from previous page


and demonstrates the significant role the Foundation has and will continue to have in the geosciences.

A common thread runs through all of the Foundation's initiatives – Building a Better Foundation for the Geosciences.

► **Opening session** – One of the highlights of the award ceremony will be when James A. Hartman is recognized and celebrated as the winner of the L.

Austin Weeks Memorial Medal.

This honor, established in 2008, is given in recognition for extraordinary philanthropy and service directed to advance the Foundation's mission. It is the Foundation's highest award.

The AAPG Foundation reaches the far corners of the globe through its grants, programs and other initiatives. You are encouraged to be informed and involved. Visit [foundation.aapg.org](http://foundation.aapg.org) for more information. 



# AAPG FOUNDATION SUPPORTS FUTURE GEOSCIENTISTS



Thank you for choosing me as the David Worthington Named Grant award recipient. The grant will help significantly with my M.S. thesis.

Aaron Rodriguez  
University of Idaho

**A**aron P. Rodriguez, a second year M.S. student at the University of Idaho, received the 2013 David W. Worthington Family Named Grant, awarded annually to a student studying paleontology. This grant helps to support Aaron's research on the Late Devonian – Early Mississippian Sappington Formation of southwest Montana.



To read more about Aaron's research, visit [blog.aapg.org/foundation/?p=965](http://blog.aapg.org/foundation/?p=965).



Bev and Dave Worthington

The David W. Worthington Family Named Grant has helped tremendously with offsetting the costs of Aaron's field work in Montana. He is very grateful for the contributions from the Worthington Family through the AAPG Foundation.

**To establish a Grants-In-Aid, contact the AAPG Foundation today.**

AAPG Foundation • P.O. Box 979 • Tulsa, OK 74101-0979 USA  
[foundation.aapg.org](http://foundation.aapg.org) • Toll Free 855.302.2743



## DPA from page 82

co-sponsored with the AAPG (see related story, page 30).

► One session on Communicating our Science, co-sponsored by the GEO-DC office and AAPG (see related story, page 28).

For our Tuesday luncheon we are thrilled to have featured keynote speaker **Susan Cunningham**, SVP of Noble Energy, whose address on the global impacts of our industry, "Exploration and the Oil and Gas Industry: Having a Positive Impact on People and the World," will be a highlight of the

conference. This luncheon will again be co-sponsored by the AWG.

\* \* \*

Last January the DPA presented its second annual Playmaker Forum in Houston. Past DPA president **Charles Sternbach** and President-Elect **Rick Fritz** did a marvelous job of assembling a full day program for the Playmaker 2.0.

Titled "From Prospect to Discovery," this forum presented a primer for exploration success.

For two years in a row this presentation has provided the DPA with significant visibility, relevance and income to allow us to continue to support our programs.

And at the forum it was a tremendous honor to present the 2013 Heritage

awards to our honorees **Bud Brigham** of Brigham Oil and Gas, and **Jim Bob Moffett** of McMoRan Exploration Company, both of whom spoke to the assembly about their insights and triumphs in the Bakken and offshore Louisiana, respectively.

\* \* \*

Plans continue to anneal for the inaugural Playmaker Canada forum, which will be presented May 27 in Calgary, Canada. The keynote speaker will be **Clay Ridell**, OC and CEO of Paramount Resources, who also will receive the 2013 DPA Heritage Award at the event.

Presentations by AAPG President **Lee Krystinik** and CSPG President **Dale Leckie** will forge a basis for further collaboration between the sister organizations – and discussions of recent discoveries and emerging plays cannot be missed.

Many thanks to the organizers; we look forward to toasting your success at the White Hat Round-up following this exciting event.

\* \* \*

What can the DPA do to entice you to join us – or if you already are a CPG, how can we keep you engaged and interested in maintaining your association with the DPA?

These questions are paramount in every recent DPA officer's mind as we struggle to maintain our membership roles.

Through personal contacts, cajoling, enlightening and, yes, even a little arm-twisting, we are staying nearly static with

our membership at a time in which our industry is enjoying a global zenith of activity and the AAPG membership roles are swelling.

As prospective YP members accumulate the experience and tenure qualifications for membership we anticipate growth, yet it is essential that we maintain – and increase our relevance with current members.

If these recent forums and presentations do not appeal, then tell us what we're NOT doing, so we can continue to provide relevant educational opportunities.

\* \* \*

Finally, my current read is Charles Duhigg's book, "The Power of Habit, Why We Do What We Do in Life and Business," in which he describes habits' mechanisms, cues and rewards.

Duhigg relates how Paul O'Neill took Alcoa from a struggling corporation in 1987 to one, which the company's annual net income was five times larger than before he arrived, and its market capitalization had risen by \$27 billion by the time he retired in 2000.

O'Neill did it by changing keystone habits. He focused on safety; he made it rewarding to achieve and changed a rigid hierarchy to build new corporate habits, which resonated with unions, workers and managers. New routines coursed through the company, costs came down, quality went up, productivity skyrocketed.

Through his singular focus on safety, he affected the dynamics of a 35,700 person multinational corporation.

Great useful insights, I recommend it. Tell me, what's on your night table? 📖

**For Analysis, Short Course and Mentoring Services**  
Please send an email or call  
**Dr. "Muki" Mukhopadhyay** ([muki@global-geoenergy.com](mailto:muki@global-geoenergy.com) or 902-401-0061)  
For  
Organic Petrology (Vitrinite Reflectance and Organic Facies),  
Petroleum Geochemistry, and Petroleum System Modeling



Dr. Muki is the Lifetime Achievement Award Winner of TROP and Charles F. Taylor Fellow of AAPG

Expertise on the Resource Evaluation of Deepwater and Ultra Deepwater based on Petroleum System Risk Assessment and Shale Oil and Shale Gas Evaluation based on Geochemical, Maturation, Pore Analysis, and Petroleum Systems Modeling



For detailed information, contact

P. Mukhopadhyay (Muki), PhD, P. Geo.  
Global Geoenergy Research Limited  
Tel: 902-401-0061 or Email to: [muki@global-geoenergy.com](mailto:muki@global-geoenergy.com)  
P.O. Box 9469, Station A (1649 Barrington Street, Suite 407)  
Halifax, Nova Scotia, Canada B3K 5S3 (B3J 1Z9)  
Webpage: [www.global-geoenergy.com](http://www.global-geoenergy.com)

## ARE YOU READY FOR THE CHALLENGE ?

California seeks highly qualified applicants for the position of chief regulator of the state's vibrant oil, gas, and geothermal industries. The position is appointed by the Governor and heads the Division of Oil, Gas, and Geothermal Resources within the California Department of Conservation. The Division has a staff of nearly 200.

The incumbent will work closely with the Governor's office, Legislature, regulators at all levels of government, and representatives of industry, the environmental community and other stakeholders in a dynamic, evolving, and challenging setting.

**BENEFITS:** medical, dental, vision, life insurance, and retirement program.

**SALARY RANGE:** \$13,400 - \$13,802 monthly

Get information and apply: [bitly.com/CAdoggr](http://bitly.com/CAdoggr)



**Oil & Gas Supervisor**  
STATE OF CALIFORNIA

Department of Conservation, Sacramento, California





## READERS' FORUM

### Induced Seismicity

Regarding "Exploring the Causes of Induced Seismicity (March EXPLORER): I was pleased to see this topical, well-presented piece.

The authors rightly advise caution in assigning source(s) to increases in local, relatively shallow seismicity. Their focus on spatial and temporal correlations, and a proper seismic instrumentation network is appreciated. The mention of frequency magnitude distributions as an investigative path is interesting.

There is at least one instance in the United States when a single deep disposal well induced seismicity. This well was on the Federal Rocky Mountain Arsenal, operated in the 1960s, east of Denver. Detailed spatial and temporal data were available; such data are typically not the case. Two good reports on the Internet are by David M. Evans (consulting geologist) and Hoover Dietrich (U.S. Geological Survey); it is not implied that this injection cause prevails for all swarms of small earthquakes ...

I trust that this sensitive research in induced or natural seismicity will continue to some finite conclusions, at least on a case-by-case basis.

And I applaud Matthew Tymchak and Sam Flewelling and others for their efforts.

Jack S. Sanders  
Dallas

### Groundwater Arsenic

Regarding "Water Crisis in Bengal" (February EXPLORER): I would like to commend AGI intern Sophia Ford and her colleagues on their work on As contamination in ground water. The problem is growing bigger by the day in West Bengal (India) – and Bangladesh, too.

Fortunately, these areas are blessed with copious rainfall, perennial rivers and many surface water bodies.

Biswas' (et al 2012) empirical observation of platform coloration, if corroborated further, would make studies to find the reasons for differential contamination easier.

It's nice to see such an article concerning contemporary life in AAPG EXPLORER.

Arijit Chaudhuri  
Mumbai, India

## CLASSIFIED ADS

### POSITION AVAILABLE

#### Petroleum Geologist

#### Illinois State Geological Survey Prairie Research Institute University of Illinois at Urbana-Champaign

The Illinois State Geological Survey (ISGS) is a premier state geological survey serving the needs of Illinois with earth science information relevant to the state's environmental quality, economic vitality, and public safety. The ISGS, which is part of the Prairie Research Institute at the University of Illinois at Urbana-Champaign, is located in the Natural Resources Building on the University's 700-acre campus.

We are seeking an experienced petroleum geoscientist to join the research team in reservoir characterization tasks for enhanced recovery of petroleum in mature oil fields within the Illinois Basin. Requirements include a minimum of a master's degree in geology, geological engineering, or related discipline. Ph.D. is preferred. Twelve (12) years petroleum geology or related industry or research experience post bachelor's degree. Knowledge of petroleum geology with an emphasis on subsurface reservoir characterization techniques such as interpreting well records and geophysical logs, including picking formation contacts and rock properties, identifying and interpreting facies, and depositional environments from subsurface geological data, cores, and outcrops, and a basic understanding of enhanced recovery techniques, reservoir diagenesis, and of petroleum systems.

Applications must be received by April 30, 2014. To apply, qualified candidates must submit an online profile through <https://jobs.illinois.edu/academic-job-board> by the closing date. Additionally, candidates must upload a 1) cover letter, 2) résumé/CV, 3) the names and contact information (including e-mail addresses) of three professional references. All requested information must be submitted for applications to be considered. Incomplete applications will not be reviewed.

For further information please contact Lori Walston-Vonderharr, Human Resources, Illinois State Geological Survey, at [lwalston@illinois.edu](mailto:lwalston@illinois.edu) or 217-244-2401.

The University of Illinois is an Affirmative Action, Equal Opportunity Employer.  
[www.inclusiveillinois.illinois.edu](http://www.inclusiveillinois.illinois.edu)

### MISCELLANEOUS

#### SAMPLES TO RENT

International Sample Library @ Midland – Formerly Midland Sample Library. Established in 1947. Have 164,000 wells with 1,183,000,000 well samples and cores stored in 17 buildings from 26 states, Mexico, Canada and offshore Australia. We also have a geological supply inventory.

Phone: (432) 682-2682  
Fax: (432) 682-2718

\*\*\*\*\*

Strengthen the confidence in your horizontal well geologic interpretation with SES! SES is technical GEOSTEERING SOFTWARE trusted by geologists everywhere. Free trial, online training, and class training available.

[www.makinhole.com](http://www.makinhole.com)  
Stoner Engineering LLC.

\*\*\*\*\*

#### MONTANA BAKKEN FIELD SCHOOL

PRISEM developed the original Montana Three Forks-Bakken-Lodgepole field school in 2008 and has led trips every summer for satisfied clients since then. "Spectacular outcrops, detailed field guide, and knowledgeable leaders with application to current activities." Customized trips for your company June through September. Visit:

[www.prisemgeoconsulting.com](http://www.prisemgeoconsulting.com)  
509-638-3729

\*\*\*\*\*

Unconventional and carbonate core description and interpretation, fracture characterization, and data integration using WellCAD software. Reservoir geology, sequence stratigraphy, and regional studies.

[DigitalStratigraphy.com](http://DigitalStratigraphy.com)



Missouri University of Science and Technology  
Geological Sciences and Engineering Department  
**Assistant/Associate Professor of  
Petroleum Engineering  
in Reservoir Characterization**

In response to program growth and campus strategic initiatives, the Geological Sciences and Engineering Department at Missouri S&T seeks applicants for a **tenure track faculty opening in Petroleum Engineering** with appointment at the assistant or associate professor level. Candidates must have an earned PhD in petroleum engineering, petroleum geosciences, or a closely related area appropriate to support research and teaching in reservoir characterization, geostatistics, petrophysics, and/or formation evaluation. Industrial experience in analyzing and evaluating the many indices used to characterize unconventional resources is strongly preferred.

For full position description including application procedures visit:

<http://hraadi.mst.edu/hr/employment/faculty/>  
(reference number R00059882).

For additional information (but not to submit applications) contact Dr. Runar Nygaard, 153 McNutt Hall, Rolla, MO 65409; [nygaardr@mst.edu](mailto:nygaardr@mst.edu); (573) 341-4759. Review of applications will begin May 10, 2014, and applications will be accepted and reviewed until the position is filled.



### Oklahoma Geological Survey THE UNIVERSITY OF OKLAHOMA MEWBOURNE COLLEGE OF EARTH & ENERGY G. Randy Keller, Director and State Geologist PETROLEUM GEOLOGIST POSITION

The Oklahoma Geological Survey is accepting applications for a position in geology with specialization in petroleum geology. Applicants must have completed at least a Master's degree in geology. The candidate should also have at least 3 years of experience in petroleum exploration and/or development. Preference will be given to individuals having experience in Oklahoma and the Mid-Continent region. The person filling this position will be expected to conduct investigations of petroleum-producing areas with a focus on Oklahoma and to participate in the development, presentation, and publication of such findings. The individual will also be expected to participate in externally funded studies through data acquisition, database management, and supervision of temporary student assistants. An important part of this position also involves public service by providing information and technical assistance to operators, consultants, and the public on a regular basis. The successful applicant may also have the opportunity to teach petroleum-related classes within the ConocoPhillips School of Geology and Geophysics.

The person filling this position must have a solid background in subsurface and surface geology and be knowledgeable in both conventional and unconventional reservoirs including clastic and carbonate strata. Expertise in well-log interpretation and subsurface geologic mapping, as well as, a thorough understanding of depositional systems and recognition of diverse rock types and facies from outcrops, core, and cuttings is essential. Additional skills needed include concise and effective communication, both written and oral, to a diverse audience ranging from informed lay- persons to specialists in the field.

The Oklahoma Geological Survey is a major unit of the Mewbourne College of Earth and Energy at the University of Oklahoma. It is also a state agency that has effective working relationships with other state agencies in Oklahoma that address earth-science issues as well as with geology programs at other universities in the region. The staff consists of about 40 persons, including geologists, geophysicists, and administrative/support personnel. A number of students are also supported as researchers in our data management and curation and seismic studies.

Interested applicants must have an OU application on file. Along with the application, a resume and cover letter that describes their background and experience in petroleum geology, as well as a copy of transcripts of all academic studies, and the names and contact information of three individuals that will attest to the applicant's capabilities, must as well be submitted online through the OU jobs site listed below. All Application submissions will be forwarded to the Search Committee, Oklahoma Geological Survey, 100 East Boyd, Room N-131, Norman, OK 73019.

To apply for this position (listed as requisition number 17186), use the following link [jobs.ou.edu/applicants/Central?quickFind=79951](http://jobs.ou.edu/applicants/Central?quickFind=79951).

This position will remain open until filled, but initial screening of applications will begin on February, 15th 2014.

*The University of Oklahoma is an equal opportunity institution [www.ou.edu/eoo](http://www.ou.edu/eoo)*

### CLASSIFIED ADS

You can reach about 37,000 petroleum geologists at the lowest per-reader cost in the world with a classified ad in the EXPLORER. Ads are at the rate of \$2.90 per word, minimum charge of \$60. And, for an additional \$50, your ad can appear on the classified section on the AAPG web site. Your ad can reach more people than ever before. Just write out your ad and send it to us. We will call you with the word count and cost. You can then arrange prepayment. Ads received by the first of the month will appear in the subsequent edition.



# Conventions: Celebrations, Connections, Memories

By DAVID CURTISS

The organizing committee has been working for more than a year, and now the time is almost here. Across the globe, geoscience professionals in our industry are packing their bags, preparing to travel to Houston, Texas.

It's time for the 2014 AAPG Annual Convention and Exhibition (ACE).

"Ideas & Innovation: Fuel for the Energy Capital" is this year's convention theme, and as you have read in these pages, there is a lot to see and do at ACE this year.

Come and learn the latest scientific advances your professional colleagues have been working on. The technical program alone boasts 425 oral presentations and 403 posters. And the list of forums and special sessions include this year's History of Petroleum Geology event, not just one but two Discovery Thinking forums and a special session on communicating our science.

Carlos Dengo will present the Michel T. Halbouty lecture, "Transcending Geoscience Paradigms for Exploration Opportunity Growth." And the luncheon speakers over three days include:

► Kirk Johnson, the Sant Director of the Smithsonian's National Museum of Natural History.

► AAPG member Susan Cunningham, senior vice president of Noble Energy.

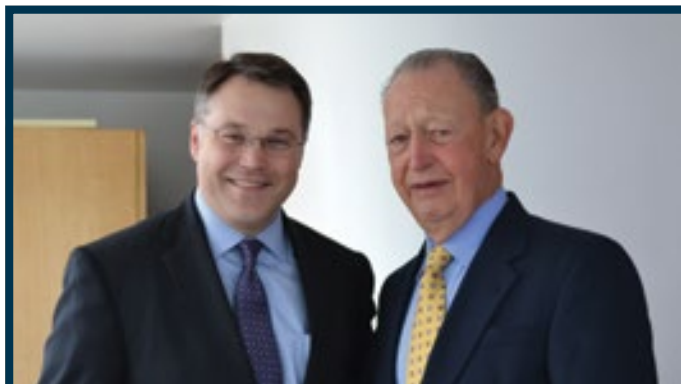
► Anthony Fiorillo of the Perot Museum of Nature and Science in Dallas.

► Scott Tinker, past AAPG president and director of the Texas Bureau of Economic Geology, talking about "The Future of U.S. Shale."

The next generation of petroleum geoscientists will be competing in the Imperial Barrel Award competition. Out of a total of nearly 130 university teams worldwide, the final 12 teams will be at ACE to present their analysis and assessment of a particular exploration dataset.

And at the IBA awards ceremony, just before the opening session, you'll find out which team takes the prize this year. This colorful and exciting event is open to everyone – it's a perfect lead-in to our opening session.

And speaking of the opening session:



AAPG Executive Director David Curtiss with his mentor and friend, the late William H. "Bill" Kanes, a Distinguished emeritus professor at the University of South Carolina.

You won't want to miss this dramatic, multi-media event where we'll recognize and celebrate the professional achievements of our colleagues. It all culminates in two very special presentations – Ernie Mancini will receive the Sidney Powers Memorial Award, AAPG's highest award, and Pete Rose will receive the Michel T. Halbouty Outstanding Leadership Award.

In the exhibition hall you'll find the latest technological innovations and tools that you can use to find more oil and gas. And participate in the Explore the Floor contest to have the chance to win prizes as you visit the exhibition.

This year AAPG's International Pavilion celebrates 20 years and anchors one end of the exhibition, with exhibitors from around the world offering investment opportunities and information about new opportunities in their countries.

If you are in charge of global new ventures for your firm, or simply want to see what is happening in other parts of the world, be sure to visit the International Pavilion.

\* \* \*

But surely one of the best reasons to come to ACE is to spend time together.

Where else can you get together with thousands of other petroleum geoscientists from around the globe, seeing old friends, meeting new friends and making the contacts that can lead to future opportunities and business?

Making and reinforcing these connections strengthens our profession. And that makes it one of my favorite

aspects of ACE.

This year, however, preparing for ACE is bittersweet for me.

Last month our profession lost a petroleum geologist whose life exemplified the nature of global connections and cooperation in our industry. And many AAPG members and other petroleum geoscientists – myself included – lost a professor, former boss, mentor and friend.

Professor William H. "Bill" Kanes passed away unexpectedly last month in Columbia, S.C. A Distinguished emeritus professor at the University of South Carolina, who got his start in the industry as a geologist for Esso, Bill was a pioneer in fostering and growing ties between the oil and gas industry and academia.

In 1973 he founded the Earth Sciences and Resources Institute at the University of South Carolina, initially funded by the U.S. National Science Foundation, for conducting fieldwork and geoscience research across North Africa, from Morocco to Egypt. In the early 1980s the institute transitioned to an industry-funded research consortium model and expanded its research portfolio to Latin America, the former Soviet Union and Asia.

The institute moved to the University of Utah in 1995 under Bill's direction, and changed its name to the Energy & Geoscience Institute. It celebrated its 40th anniversary last year and has more than 70 international oil and gas companies that sponsor its research programs around the globe.

This is where I grew up, both figuratively and literally, as a graduate

student at South Carolina and professionally at the University of Utah. It's where I learned to love our business, learning from and working with Bill and the many other remarkable people whose lives and careers have intersected ESRI and EGI.

In fact, no matter where in the world I am, from Tripoli to Bogota, Bahrain to Houston, when I meet a petroleum geoscientist and we quickly skim our histories to look for common experiences or people, there are no more than two degrees of separation before we get to Bill or the institute. They either know him themselves or know someone who does.

That is his wonderful legacy.

I hadn't spoken to Bill in almost two years. I had allowed the busyness of personal life and career to take over, and hadn't spent the time and effort to maintain that connection as well as I should have.

Then in early March my office phone rang, and out of the blue I heard Bill's voice on the line. He was excited about ACE and about getting together. In fact, he was arranging a dinner with several other South Carolina grads, including DEG president Doug Wyatt and DEG past-president Tom Temples, Bill's last two doctorate students, and wondered if I would be able to join him. The answer, naturally, was "Of course!"

Sadly, Bill passed away the following week. But I am so grateful for his phone call and the fact that we had a few minutes to talk and to catch up on life.

It's so easy to let these relationships slip, to grow cold.

Who has been influential in your life and career? Is it possible that you'll both be attending ACE this year? Don't wait. Make the phone call and take this opportunity to reconnect.

Bill, thank you for the influence that you had in my life. Rest in peace, my friend.

*David H. Curtiss*

## DIVISIONS REPORT: DPA

# Sponsorship Change Would Be a Good Move

By VALARY SCHULZ, DPA President

This first Division of the AAPG has more than 45 years of history since our inaugural president, W. Dow Hamm, served 1968-69. The introduction of certification to AAPG required a mechanism for administration, and the DPA was organized with the principal purpose to "strengthen the professional status of geoscientists" and "to require high standards of competence among practicing geologists."

These changes were affected through our democratic process and amended into the AAPG Bylaws by our elected representatives to the House of Delegates.

In a few short days the HoD again will consider motions that will have lasting repercussions for our organization. The proposal to eliminate sponsors for membership will remove any impediment



SCHULZ

The proposal to eliminate sponsors will remove any impediment to a speedy application process by which qualified candidates for membership in our organization may be welcomed.

to a speedy application process by which qualified candidates for membership in our fine organization may be welcomed.

I believe this will be good for the AAPG and good for the DPA.

Those members who wish to signify their commitment to their career and industry may then apply to the DPA and go through the rigorous process

of peer-reviewed certification of their competency and their ethics.

\* \* \*

Our bylaws require us "to communicate to the general public and to government agencies information on legislative decisions affecting the regulation of petroleum resource

exploration and development."

Indeed, we direct much of our collective energies to maintaining our obligation to educate our members and provide opportunities for them to enhance their professional development, such as at ACE 2014, where our ace DPA Vice Chair Chandler Wilhelm has assembled a significant presence. That would include:

- Three short courses.
- ✓ Black Belt Ethics.
- ✓ Geosteering Principals, Practice and Pitfalls.
- ✓ Everything You Wanted to Know about the Oil and Gas Business, But Were Afraid to Ask.
- Two Discovery Thinking sessions,

See DPA, page 80



# the largest onshore data library in north america

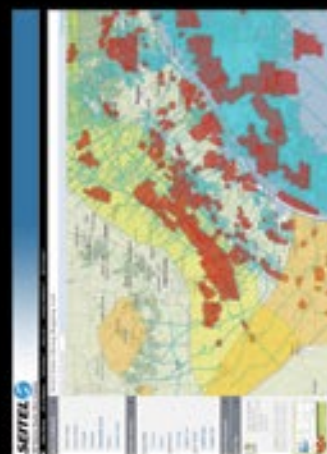


## call Seitel. drill Smart.

For more than 30 years, Seitel has acquired the data that oil and gas companies use to make smart drilling decisions. We have built an extensive library of high quality surveys, and are continuing to invest in new 3D surveys across the US and Canada. We own over 40,000 square miles of 3D onshore data, over 10,000 square miles of 3D offshore data, and approximately 1.1 million linear miles of 2D seismic data across North America. License data from our existing library or partner with us to design and acquire your next 3D data survey.

- Quality 2D and 3D seismic
- Acquisition management
- Fast-track processing
- Pre-stack depth migration
- Azimuthal analysis
- EarthStudy 360
- Multi-Component Processing
- 5D Interpolation

seitel.com



Visit [seitel.com](http://seitel.com) often to see our acquisitions in progress, and seize the competitive edge by being the first to license our latest data.





**Multiclient**

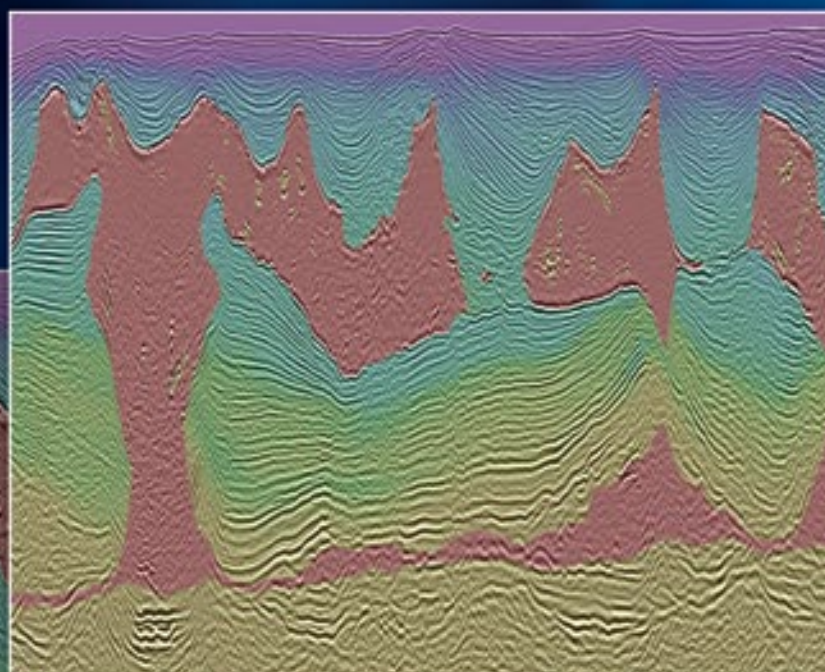
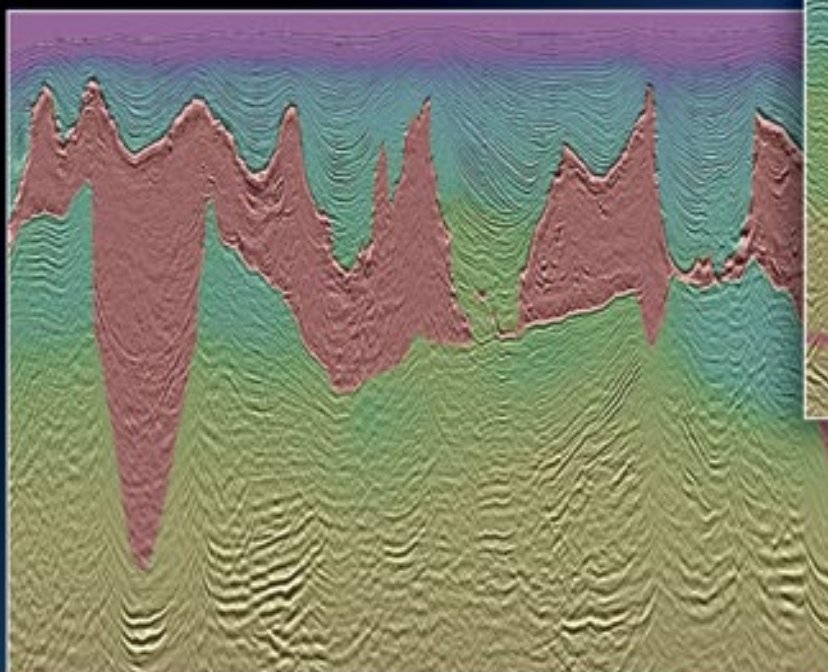
Acquisition by WesternGeco

**Revolution**

Model 2013

**Conventional**

Velocity Model E-Dog 2006



*A comparison of conventionally acquired narrow-azimuth data from 2006 (left) and full-azimuth data acquired and processed for the Revolution survey in 2013 (right). The new data allows better delineation of the subsalt structure and accurate reservoir definition to help mitigate drilling risk.*

## Illuminate beyond the salt with the latest high-resolution Gulf of Mexico data.

Schlumberger Revolution multiclient seismic surveys integrate more than 27,000 km<sup>2</sup> of ultralong-offset seismic data obtained using WesternGeco Dual Coil Shooting\* multivessel full-azimuth acquisition. Acquired and processed using the latest technology and interpreted with deep geoscience expertise, Revolution survey data allows you to visualize the salt-sediment interface, map the Mesozoic section, and see deeper into the reservoir.

See the data yourself at  
[slb.com/revolution](http://slb.com/revolution)

**Schlumberger**

\* Mark of Schlumberger. Copyright © 2014 Schlumberger. All rights reserved. 13-F5-0190